

# Exhibit D

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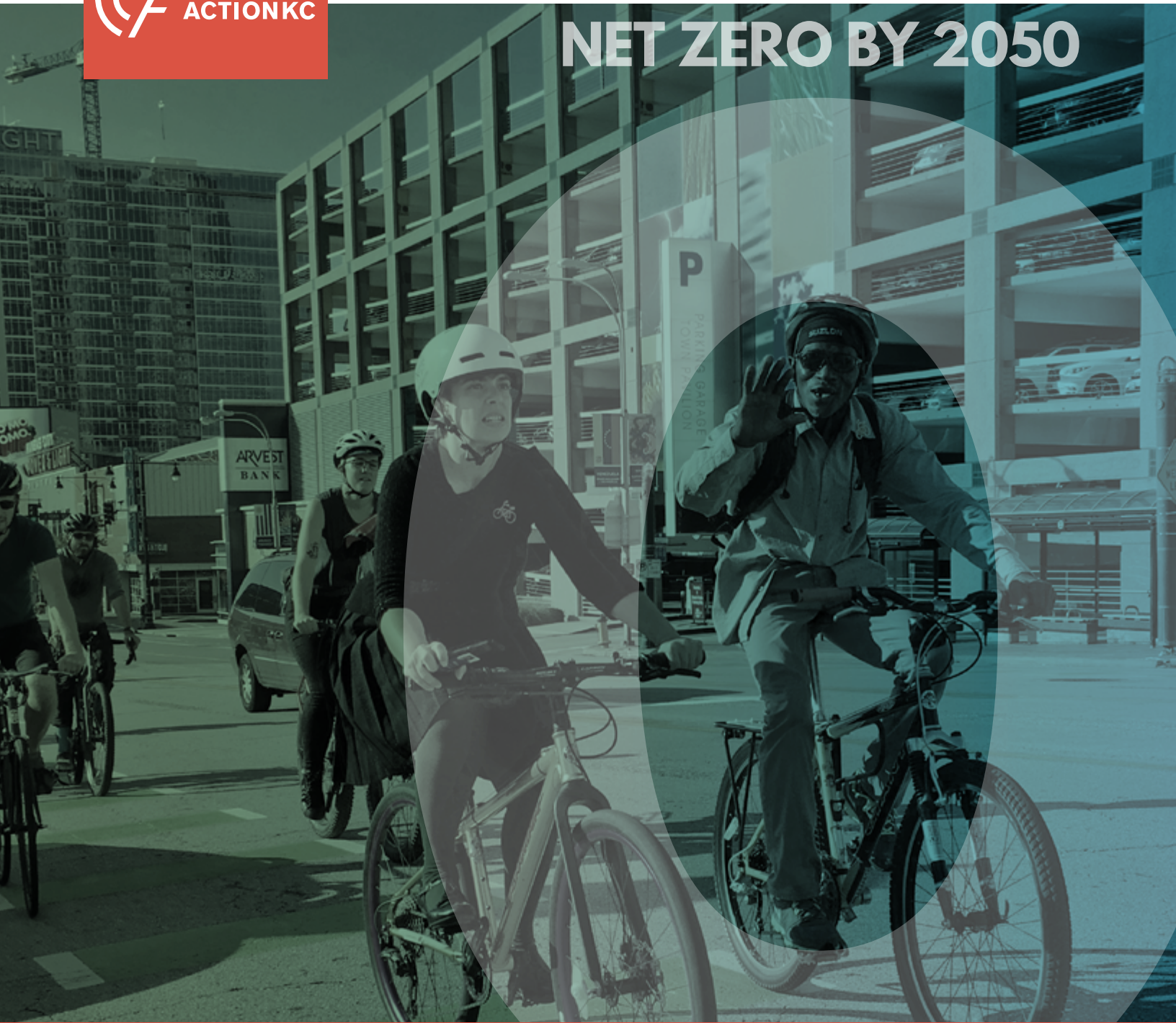
**CLIMATE ACTIONKC**



# Regional **CLIMATE ACTION PLAN**

Creating equitable and just climate resilience  
in the Kansas City region

## NET ZERO BY 2050





**KC**  
**Regional**  
**CLIMATE ACTION PLAN**

This plan creates a voluntary framework to guide and align local action in ways that make a difference for the entire Kansas City region.

Readers will find a comprehensive set of strategies in this plan that can be tailored to meet local community needs and priorities.

MARC and Climate Action KC are here to support you in your climate action efforts.

To find out more, please contact us at [cap@marc.org](mailto:cap@marc.org) or 816-474-4240.

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Smithville Lake  
Photo courtesy of Laura Gilchrist.

# A Letter From the Climate Action KC Founders

The document you're now holding started, like all things do, with an idea. As newly elected officials, we knew it was necessary to tackle the existential threat of climate change.

While we may have had the ambition and naivete to believe we could have an impact, we realized that we did not have the resources, the knowledge or the vehicle to go about tackling this challenge alone.

Nor should we go it alone. In society, we enjoy life through the help of others — and in a region like Kansas City, we know that our destinies are intertwined. Many of the biggest areas of our environmental impact transcend our jurisdictional boundaries: transportation systems, food, water and air all are beyond the control of our individual cities alone. Our region encompasses ten counties, over 100 cities and a multitude of other governing bodies and oversights. To move the needle the furthest, find efficiencies and expedite action, **we have to act together.**

This plan comes from a place of love for Kansas City. As natives of the metro, we've been raised among those things that make it special: Chiefs football, fountains, Midwestern hospitality, and barbecue aromas, to name a few. We know that there is something special here, something that rises above the state line and other boundary lines between us. Bob Berkebile, a friend and mentor, refers to it as the “*heart spirit*” that overcomes differences and connects us to something greater.

We believe that spirit, that heartbeat, echoes throughout this plan.

This work would not have been possible without the tireless efforts of hundreds of volunteers, committee members, elected leaders and organizational partners. It would take a good portion of the plan to recognize them all, but a few deserve specific mention:

- Ryan Glancy and the International Urban Cooperation initiative of the European Union are key partners, and their willingness to create a pilot program ensured we had the technical support and international experience to make this plan successful.
- The Climate Action Plan committee of Climate Action KC, led by Brian Alferman and Joan Leavens, worked for more than a year to shape the direction and solutions found herein. And we appreciate the committee's ongoing work.
- To all of our leaders who shifted course during the COVID-19 pandemic and moved our engagement efforts online, we appreciate your creativity and adaptation. It may not have been how we expected to receive feedback, but hundreds of community members were able to help prioritize the solutions in this plan. We appreciate your efforts as well.

And now, the real work begins. This is a starting point. It gives us a baseline from which to work, and will need amendment in future years. We recognize that those most vulnerable to a changing climate are those who are already the most vulnerable members of our community, and more focus will be necessary on this equity challenge. But, this plan is only as good as the ways in which it translates into action, and we want it to be a springboard to progress.

Therefore, we ask that once you read the goals and solutions in this plan, please do not let it immediately find the bookshelf. Use it. Take it to your elected officials, your business leadership, your pastor or rabbi. Find ways where the knowledge herein translates into betterment for yourself and your community. We hope it inspires you as it has inspired us.

This plan is dedicated to the memory of Dennis Murphey. Those who knew Dennis will remember his generosity of time and talents, and his love for Kansas City and its environment. We miss him, and will never forget how he inspired CAKC from the start.

With gratitude,



**Mike Kelly and Lindsey Constance**

Climate Action KC Steering Committee



“Plogging” event, Summer 2018.  
Photo courtesy of MARC.

# Introduction



This Climate Action Plan is a product of stunning collaboration across the Kansas City metro area, representing the views of more than 1,000 community residents and stakeholders. It provides an ambitious voluntary framework to build sustainability, resilience and social equity — all within the context of everyone helping each other to achieve our shared goals and aspirations. And while imperfect, it provides a clear starting point to initiate a range of actions that will build resilience over time.

The plan is built upon the belief that we can create transformative change that, at once, improves health and the environment, creates jobs, strengthens neighborhoods, and increases opportunity and community wealth. The plan will reduce our carbon footprint. More importantly, the plan's ultimate success will result from the creativity inherent in collaborative, creative problem solving, leaving indelible handprints.

The plan serves 10 counties, 123 municipalities in two states, with a population of 2.14 million. In Kansas, these include Douglas, Johnson, Leavenworth, Miami and Wyandotte counties; in Missouri, the planning area includes Cass, Clay, Jackson, Platte and Ray counties.

A collaborative regional approach defines this plan, unlike many other municipally focused climate plans. The reasons for this are practical. Emissions arise from regional energy and transportation systems that cross political boundaries. Collaborative solutions embrace large-scale natural, economic, social and infrastructure systems, and collaborations across city, county and state boundaries have proven to create efficiencies and synergies that are not available to communities tackling the problem alone.

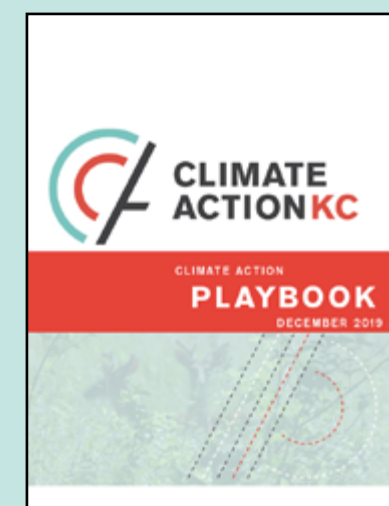
This document attempts to answer many questions that commonly arise in climate discussions. What is the nature of the problem? What climate impacts do we foresee for the Kansas City region? What solutions make the most sense for our community, and where should we start? How can we share the costs and benefits of both problems and solutions in a way that uplifts all communities? What can each of us do to contribute to the solution? How do we know if we have succeeded?

The plan establishes goals, strategies and priorities across nine sectors. Implementation of the strategies and recommendations will rest upon the intersection of collaborative regional solutions with locally appropriate action. This plan, then, creates opportunities to work together at every scale to make progress everywhere and as quickly as we can.

## Planning Area



The planning area for the Climate Action Plan includes 10 counties: Douglas, Johnson, Leavenworth, Miami and Wyandotte counties in Kansas, and Cass, Clay, Jackson, Platte, and Ray counties in Missouri.



[click thumbnail to view the full Climate Action Playbook](#)

In December 2019, Climate Action KC and MARC published the Climate Action Playbook. The playbook translates the **Project Drawdown** pollution reduction strategies into actions and policies that can be taken by local governments. These strategies and actions are organized into six sectors: **Buildings and Cities, Electricity generation, Food, Land Use, Materials, and Transportation**. Many of these strategies can be found within this plan.

While the playbook represents a local government-focused menu of actions, the Climate Action Plan presents a broader set of strategies and actions that meet an ambitious 2050 net zero greenhouse gas reduction target within an integrated systems-based understanding. Drawdown strategies are also complemented by climate adaptation goals with a strong social equity focus.



**In memory of our friend  
Dennis Murphey**

This plan is dedicated to the memory of Dennis Murphey, who most recently served as the chief environmental officer for the city of Kansas City, Missouri, for 13 years before his retirement in 2019.

Dennis was a friend, leader and trusted colleague who generously shared his wisdom and insight. He led by example for those who worked on this Climate Action Plan, successfully reducing municipal greenhouse gases in Kansas City, Missouri, by over 40% through his efforts.

Dennis left an indelible mark on the entire region and while we miss him dearly, we intend this dedication as a means to inspire and motivate the next generation of climate action champions as Dennis did for so many of us.



# Vision Statement

In 2050, the Kansas City region is a resilient, equitable and inclusive community thriving amidst the impacts of a changing climate. Regions around the world look to us as a leader in governance, innovation and sustainability. Kindness and compassion guide a prosperous green economy and a healthy natural environment.

## Guiding Principles

The following principles, drawing from an extensive community and stakeholder engagement process resulting in MARC's Climate Resilience Strategy (2015), guided the development of this plan and will guide our collective commitment to climate action throughout implementation.

- So much of what we need to do, we want to do. Climate Solutions build stronger, healthier and more vibrant communities.
- Resilience builds on previous investments, from trees to transit.
- Leadership comes from all of us.
- Resilience focuses on solutions that address mitigation and adaptation at the same time.
- Solutions must catch up to the scale of the problem, and there is much that we can do to make a big difference.
- Do no harm. Doing nothing is harmful. Doing a lot is possible.
- Resilience creates economic vitality and environmental health, with an unblinking social equity lens and a commitment to public health.
- Complex linkages among sectors and disciplines require an integrated, systems-based and collaborative approach.



# CAKC Equity Statement

Climate Action KC believes the success of any climate action will only be achieved if there is equitable access to the benefits among the entire population of the metropolitan area without regard to race, gender, ethnicity, religion, nationality, sexual orientation, income, age, disability or any other classification. Impacts of climate change have put a spotlight on the widening inequities of people in cities across the nation, so any vision for a sustainable, long-term transformation toward a healthier region must include a proactive approach toward equity in all aspects.

Climate Action KC is committed to ensuring everyone in the region has fair and equitable access to opportunities and solutions. This commitment will be acted on in the following ways:

Climate Action KC will consider the legacy of historical injustices and biases, as this legacy provides a critical context for relating to, and elevating, affected populations. Without this context, and resulting efforts to rectify unjust systems, those systems may be perpetuated under a false impression of equitable access to opportunity.

Climate Action KC will work at the intersection of equity and climate to approach this work in a holistic manner. Potential future injustices will also be evaluated to prevent vulnerable communities from bearing disproportionate harm because of climate change. These communities must be equipped with intentional strategies, methods and resources to successfully implement climate action.

Climate Action KC will strive not only to include diverse perspectives in its membership, but create an environment of inclusion and belonging that removes barriers to sharing and hearing those perspectives in the pursuit of equity for all.



# Acknowledgments

## Climate Action Plan Advisory & Stakeholder Committee

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<b>Brett Cranor</b> Blue Valley SW HS	<b>Jennifer Nguyen</b> Lincoln College Prep	<b>Kat Riggs</b> Notre Dame de Sion	<b>Palmer McLaughlin</b> Christa McAuliffe Elementary	<b>Vinny Sandhu</b> Blue Valley SW High School
<b>Carina Swanson</b> Shawnee Mission South HS				

## Sector Working Groups

<b>Building &amp; Energy</b>	<b>Green Infrastructure &amp; Food Systems</b>	<b>Transportation &amp; Land Use</b>	<b>Solid Waste</b>	<b>Innovation &amp; Finance</b>
<b>Bob Berkebile</b> BNIM	<b>Laura Adams</b> Black and Veatch	<b>Sarah Copeland</b> City of North Kansas City, Mo.	<b>John Blessing</b> Waste Management	<b>Amanda Graor</b> MARC
<b>Dominique Davison</b> DRAW Architecture	<b>Chris Cardwell</b> Bridging The Gap	<b>Beth Dawson</b> MARC	<b>Kristan Chamberlain</b> KC Can Compost	<b>Sara Greenwood</b> Greenwood Consulting
<b>Kirk Gastinger</b> Center for Understanding the Built Environment	<b>Chris Cline</b> Confluence	<b>Kyle Elliot</b> City of Kansas City, Mo.	<b>Lydia Gibson</b> Ripple Glass	<b>Ashley Hand</b> CityFi
<b>Ashok Gupta</b> NRDC	<b>Margo Farnsworth</b> Deep Roots KC	<b>Kelly Gilbert</b> Metropolitan Energy Center	<b>Lara Isch</b> Kansas City, MO	<b>David Johnson</b> Kansas City Area Transportation Authority
<b>Dawn Heim</b> Evergry	<b>Katherine Kelly</b> Cultivate KC	<b>Gunnar Hand</b> Unified Government of Wyandotte County/ Kansas City, Kansas	<b>Nadja Karpilow</b> MARC SWMD	<b>Jeremy Knoll</b> BNIM
<b>Kristina Kohler</b> Independent Consultant	<b>Ginny Moore</b> Conservation Fund	<b>David Johnson</b> Kansas City Area Transportation Authority	<b>Lisa McDaniel</b> MARC SWMD	<b>Kevin McGinnis</b> Keystone Innovation District
<b>Jeremy Knoll</b> BNIM	<b>Jason Parson</b> Parson Associates	<b>David Johnson</b> Kansas City Area Transportation Authority	<b>Matt Riggs</b> MARC SWMD	<b>Matthew Mellor</b> Startland
<b>Christopher Mitchell</b> AO Design	<b>Scott Schulte</b> Vireo	<b>David Johnson</b> Kansas City Area Transportation Authority	<b>Stan Slaughter</b> Missouri Organic	<b>Keely Schneider</b> Workforce Partnership
<b>Julie Peterson</b> USGBC	<b>Stephen Van Rhein</b> City of Kansas City, Mo.	<b>David Johnson</b> Kansas City Area Transportation Authority	<b>Kechia Smith</b> Bridging The Gap	<b>Ilya Tabakh</b> Elementio Group
<b>Ben Postlethwait</b> Evergry		<b>Lisa Koch</b> University of Kansas Transportation Center	<b>Trent Thompson</b> Johnson County Dept. of Health and Environment	
<b>Kristin Riott</b> Bridging The Gap		<b>Beto Martinez Lugo</b> Clean Air Now		
		<b>Martin Rivarola</b> MARC		
		<b>Brien Starner</b> Kansas City Area Transportation Authority		
		<b>Jeffrey Williams</b> City of Kansas City, Mo.		
		<b>Josh Wood</b> City of Olathe, Ks.		

## Sector Working Groups (continued)

<b>Public Health</b>	<b>Dr. Elizabeth Friedman</b> Children's Mercy Hospital	<b>Kevin Kennedy</b> Children's Mercy Hospital	<b>Marlene Nagel</b> MARC	<b>Amy Roberts</b> City of Kansas City, Mo. Health Department
<b>Dr. Daphne Bascom</b> St. Luke's Health System	<b>Emily Hurley, Ph.D.</b> Children's Mercy Hospital	<b>Audrey McCalley</b> University of Kansas Medical Center	<b>Dr. John Neuberger</b> KU Medical Center	<b>Dena Sneed</b> Truman Medical Center
<b>Mary Beverly</b> Johnson County, Ks.		<b>Jeanette Metzler</b> Advent Health	<b>Ashley Papenberg</b> St. Luke's	

## MARC staff contributors

<b>Ron Achelpohl</b> Director of Transportation & Environment	<b>Amanda Graor</b> Chief Innovation Officer	<b>Tom Jacobs</b> Director of Environmental Programs	<b>Lisa McDaniel</b> Solid Waste Program Manager	<b>Muril Stone</b> Database Specialist
<b>Karen Clawson</b> Air Quality & Rideshare Program Manager	<b>Jay Heermann</b> GIS Manager	<b>Alecia Kates</b> Water Quality Planner	<b>Doug Norsby</b> Air Quality Planner	<b>Amy Strange</b> Public Affairs Coordinator
<b>Joe Gauer</b> Public Affairs Coordinator	<b>Sara Hintze</b> GIS Data Developer/ Data Analyst	<b>Kate Ludwig</b> Air Quality Intern	<b>Natalie Phillips</b> Rideshare Program Coordinator	<b>Logan Strasburger</b> Transportation Intern
	<b>Synthia Isah</b> Water Quality Planner	<b>Laura Machala</b> Transportation Planner	<b>Kaleena Salazar</b> Transportation Intern	<b>Kristin Johnson-Waggoner</b> Director of Public Affairs

## Climate Conversations

<b>Dr. Daphne Bascom</b> St. Luke's Health System	<b>Sharice Davids</b> U.S. Representative, Kansas 3rd District	<b>Tom Jacobs</b> MARC	<b>Mike Kelly</b> Climate Action KC / City of Roeland Park, Ks. Mayor	<b>Gloria Ortiz-Fisher</b> Westside Housing
<b>Lindsey Constance</b> Climate Action KC / City of Shawnee, Ks. City Council	<b>Gary Downes</b> U.S. Engineering	<b>Chuck Kaisley</b> Evergry	<b>Julie Sayer</b> City of Lenexa, Ks. City Council	<b>Julie Sayer</b> City of Lenexa, Ks. City Council
<b>Damon Daniel</b> Ad Hoc Group Against Crime	<b>Karan Gupta</b> Elemental Consulting	<b>Max Kaniger</b> Kanbe's Market	<b>Jeremy Knoll</b> BNIM	<b>Scott Schulte</b> Vireo
	<b>Seft Hunter</b> Communities Creating Opportunity	<b>Alecia Kates</b> MARC	<b>Joe Lauria</b> WDAF Meteorology	<b>Brandon Wikoff</b> U.S. Engineering
		<b>Michael Kelley</b> BikeWalk KC	<b>Dina Newman</b> Center for Neighborhoods	

# Timeline



The Kansas City region has a long history of working to build economic, social and environmental sustainability through leadership, planning and action. One of this plan's principles is to build from success. A brief review of some of the regional sustainability initiatives provides an understanding of how proposed future endeavors may be informed by previous successes.

- 1991** • MetroGreen plan completed by Kansas State University and the Prairie Gateway Chapter of the American Society of Landscape Architects
- 1998** • Launched Creating Quality Places initiatives
- 2002** • The Smart Moves Regional Transit Plan adopted with updates in 2008 and 2017
- 2003** • Finalized updates to stormwater management engineering standards, planning guidelines and a model stream setback ordinance
- 2005** • Clean Air Action Plan completed with updates in 2011 and 2018
  - First Natural Resource Inventory created, with update in 2013
- 2008** • Regional Forestry Policy Framework
  - Sustainable Solid Waste Management Plan
- 2010** • Completed Transportation Outlook 2040, which includes adaptive sustainability, climate change and energy use strategies.
- 2011** • Launched Creating Sustainable Places
- 2014** • U.S. Department of Energy and the White House designate a Kansas City-area consortium as a Climate Action Champion
- 2016** • Adopted the Regional Climate Resilience Strategy
- 2018** • Green Infrastructure Framework adopted
- 2019** • “Urban Heat Island Mitigation Assessment and Policy Development for the Kansas City Region” completed by Lawrence Berkeley National Laboratory and MARC

## Regional Climate Action Plan milestones

### 2018

- December – Climate Solutions Workshop held with over 130 elected leaders from 30+ municipalities

### 2019

- March – MARC Board of Directors votes to join Global Covenant of Mayors (GCOM)
- September – Climate Action Summit held with 750 participants and 40 speakers
- October – Launched Mid-America Climate Fundamental Academies in partnership with the Association of Climate Change Officers
- October – Held two-day technical workshop with GCOM in preparation for the Greenhouse Gas Inventory and Climate Risk & Vulnerability Assessment
- December – Published Climate Action Playbook and launched at public event

### 2020

- April – Regional Greenhouse Gas Inventory and the Climate Risk & Vulnerability Assessment completed
- April – Launched the first phase of community engagement process for the Climate Action Plan
- May – Presented findings from the Regional Greenhouse Gas Inventory and the Climate Risk & Vulnerability Assessment
- June-August – Convened six sector working groups to refine draft climate action strategies
- November – Launched the second phase of community engagement process

### 2021

- February – The MARC Board of Directors and Climate Action KC Executive Committee adopts the Regional Climate Action Plan

# About Us



## What is MARC?

The Mid-America Regional Council (MARC) is a nonprofit association of city and county governments and the metropolitan planning organization for the bistate Kansas City region.

Governed by a Board of Directors made up of local elected officials, MARC serves nine counties and 119 cities. MARC provides a forum for the region to work together to advance social, economic and environmental progress.

## What is CAKC?

Climate Action KC is a nonprofit dedicated to bringing local leaders together to reduce emissions and improve the quality of life across the Kansas City region.

The coalition is made up of more than 100 local and state elected officials, and leaders from many significant civic, nonprofit, public and corporate organizations.

## Climate Action Plan team

In December 2018, a group of over 130 local and state elected leaders, community leaders and stakeholders convened on a Saturday morning at a church to learn about Project Drawdown, local climate protection planning and lessons from a peer city on successful collaborations and planning for climate action.

Building on this energy, Climate Action KC was formed. Together, Climate Action KC and the Mid-America Regional Council (MARC) assembled an ambitious work plan, which included developing a playbook of climate strategies for local governments, state legislative platforms for Missouri and Kansas, and the completion of the first

regional climate action plan.

In March 2019, the MARC Board of Directors voted to join the Global Covenant of Mayors (GCoM) on behalf of the cities and counties in the region. By joining as a region, the GCoM membership also provided MARC with an opportunity to apply for a new program to support regional climate action planning. MARC was accepted, along with the Chicago, Denver, Minneapolis and Washington, D.C., regions, to receive special technical assistance to guide the greenhouse gas inventory, climate risk and vulnerability assessment, and climate action plan.

## MARC vision statement

Formed at the confluence of rivers, trails and trains on the border of two states, Greater Kansas City is a place of interconnection, where people of all backgrounds are welcome and where commerce and ideas flow as freely as the rivers and streams that run through and define it.

Our people thrive here in safe, walkable and well-maintained neighborhoods. We have abundant opportunities for

education and work in fulfilling jobs at businesses that can compete with any in the world.

We enjoy, protect and preserve our region's natural beauty. We care for our neighbors and our communities. We lead by example. Our region has the strength to not only bounce back from adversity, but bounce forward, confidently, into the future.

## Global Covenant of Mayors

The GCoM is the largest global alliance for city climate leadership, built upon the commitment of over 10,000 cities and local governments from six continents and 138 counties.

GCoM is an initiative of the European Union's International Urban Cooperation program.

MARC's commitments as a member of GCoM include:

- Completion of a community-scale greenhouse gas (GHG) emissions inventory, following the recommended guidance.
- Completion of an assessment of climate risks and vulnerabilities.
- Adoption of ambitious, measurable and time-bound target(s) to reduce/avoid GHG emissions.
- Adoption of ambitious climate change adaptation vision and goals, based on quantified scientific evidence when possible, to increase local resilience to climate change.
- Adoption of ambitious and just goals to improve access to secure, sustainable and affordable energy.
- Adoption of a plan addressing climate change mitigation, low emission development, climate resilience and adaptation, and access to sustainable energy.
- Regular reporting through the [CDP global carbon disclosure system \(www.cdp.net/en\)](http://www.cdp.net/en).



# Community Engagement

Community engagement and participation are powerful factors in the success of a climate action plan. Before planning began, a community engagement plan was developed in partnership with stakeholders, nonprofit organizations and community volunteers. The plan included strategies focused on providing information and education as well as ways for members of the community to take part in the process from beginning to end.

The rise of the COVID-19 pandemic forced necessary changes to many aspects of the engagement plan. For instance, workshops and in-person presentations and discussions in the community were transitioned to an online format. While an online-only format was challenging in many ways, there were also many benefits. The online format allowed staff to engage many more people. And it provided flexibility for members of the community to be able to participate on their own time.

Below is a snapshot of the primary ways people were engaged in this process.

## Climate Action Summit

Sept. 14, 2019



The Climate Action KC coalition hosted its first Climate Action Summit at Johnson County Community College in Overland Park, Kansas. About 485 people attended the full-day event and 725 were on hand for the afternoon keynote session, which was open to the public. The summit focused on creating awareness of the impact of climate change in the region and the importance of addressing it through regional collaboration. The summit featured a presentation by Principal Emeritus of BNIM, Bob Berkebile; as

well as remarks by U.S. Representatives Sharice Davids and Emanuel Cleaver II; a discussion with Kansas City, Missouri, Mayor Quinton Lucas; and a keynote address by environmentalist and author Paul Hawken.

## GCOM Climate Leadership Project Workshop

Oct. 1-2, 2019

MARC hosted a two-day workshop for stakeholders to kick off the process to develop a regional Climate Action Plan, including a Greenhouse Gas (GHG) Inventory and Climate Risk and Vulnerability Assessment (CRVA). This workshop invited stakeholders from various sectors to learn and ask questions about the technical elements and requirements of the GHG Inventory and CRVA. Feedback from participants was also collected to inform elements of the CRVA, such as the hazard impact on sectors, assets and services.

## Climate Action Playbook event

Dec. 17, 2019



Climate Action KC and MARC unveiled the new Climate Action Playbook at a public event where over 250 people attended. In addition to the unveiling of this playbook, the Climate Action Plan process was launched with an exercise using interactive polling. Participants were asked which actions in each section of the playbook (buildings and cities, food, land use, etc.) they would give the most priority. They were also asked what one

climate resilience action they would fund if they had \$5 million.

With so much interest in the planning process, participants were also asked to fill out a survey showing their interest and expertise within several identified sectors or areas of work. The intent was to begin building out networks within each of these areas to support the planning process and implementation of the final plan.

## Climate action webinar

May 14, 2020

With the Greenhouse Gas Inventory and Climate Risk and Vulnerability Assessment completed, MARC and Climate Action KC, in partnership with the GCoM, held a webinar to share the findings from both efforts. Over 250 people attended the webinar and a video recording was made available on YouTube for those who could not attend. A second similar webinar was presented to members of the Greater Kansas City Chamber of Commerce.

## Online community engagement

May 14 - July 15, 2020

A large community workshop was planned for late March but was canceled due to COVID-19 stay-at-home orders in Kansas City, Missouri. Continuing to conduct community engagement was critical and so workshop activities transitioned to an online format.



A multi-week engagement series using the mobile-friendly MindMixer platform was planned to allow more time and flexibility for interested individuals to interact with the platform.

Each week of the engagement focused on a different topic area:

- Week 1: Resilience
- Week 2: Transportation & Land Use
- Week 3: Food & Land

- Week 4: Built Environment
- Week 5: Energy & Industry
- Week 6 & 7: Priorities Week

Within each week, the online community of over 275 active participants was asked questions and given surveys and polls that would help generate new ideas for climate actions and indicate priorities.

There were 56 topics in total. The weeks were moderated by volunteer experts in each of the topic areas. Once the engagement concluded, all of the ideas and priorities were synthesized for review and discussion by a set of work groups focused around each topic area.

## Working groups

August - September 2020

Sector work groups were formed and met several times to help refine and develop mitigation and adaptation goals and strategies for the plan. The work groups were also charged with helping to identify important linkages across sector areas—where a strategy in one sector also provides mitigation and/or adaptation benefits in another sector.

This exercise helped to further focus in on the strongest strategies to include in the plan. There were six work groups covering the areas of transportation and land use, public health, food systems and green infrastructure, energy and buildings, innovation and finance, and waste.

## Community review sessions

November 2020

MARC held 11 one-hour online community discussions to hear feedback from community members on the goals and strategies in the action plan. The strategies, along with an explainer video, was posted online for the public to review.

Community members were invited to choose one of the discussion times that best worked with their schedules. Organizations or individuals interested in providing feedback were able to request special meetings as needed or send feedback via email to staff. The community sessions had over 70 participants.

## Climate Conversations

Summer 2020

Climate Conversations was a series of 14 short video interviews that was produced and promoted during the first phase of community engagement, aligning with each weekly topic to provide education and generate interest.

Each interview hosted experts and community leaders who share about the work they are involved in and what their climate action priorities are.

All Climate Conversations interviews can be found at [climateactionkc.com/conversations](https://climateactionkc.com/conversations) or by clicking the thumbnail below:



## Engagement of vulnerable communities

There are many organizations in the region that took part in the engagement process that directly serve vulnerable communities. Their voices were extremely powerful in conversations

about equity and climate justice and how the plan should reflect these tenets. MARC and the Climate Action KC Equity Committee held several meetings with additional organizations, and this work will be continued with a focus on supporting leadership-building in the communities that are most vulnerable to the impact of a changing climate.

## Local government leadership engagement

Engaging local government leaders, including elected officials, city and county management, and staff, in discussions about climate resilience is critical to the implementation of the plan. While many local government leaders took part in all phases of engagement during the plan's development, targeted efforts were made to bring in as much local leadership into the conversation as possible.

A natural point of interaction lies in the myriad of MARC committees. Many presentations were made over the course of nearly two years to these committees, including the MARC Board of Directors, Air Quality Forum, Total Transportation Policy Committee, Sustainable Places Policy Committee, Regional Transit Coordinating Council, Planners' Roundtable, Managers' Roundtable and many more. In many cases, these committees posed questions about coordination on climate issues at the city and county level, and provided a sounding board for some of the boldest ideas in the plan.

## Youth Committee

Climate Action KC formed a youth committee to provide a platform for young leaders to connect to regional climate action planning and explore ways to translate that action within a school setting. Youth from schools across the region took part in this committee and offered hopes and ideas for the plan. The committee worked through a process to prioritize actions that they would like to pursue as a group as well as ways to coordinate and connect schools across the region in these efforts.

# Local Impact of Climate Change

## Climate change: What is it?

Climate change describes a change in the average conditions—such as temperature and rainfall—in a region over a long period of time. Global climate change refers to the average long-term changes over the entire Earth. NASA scientists have observed that Earth's surface is warming and many of the warmest years on record have happened in the past 20 years.<sup>1</sup>

Climate change has both natural and anthropogenic causes. Anthropogenic causes—or climate change due to human activity—has a 95% probability of being responsible for much of the observed increase in Earth's temperatures over the past 50 years.<sup>2</sup> Industrial activities by humans are changing the “natural greenhouse” and causing the greenhouse effect. This happens when natural and man-made heat-trapping gases from industry accumulate in the atmosphere, allowing in the short wavelengths of the sun's light (solar radiation) and trapping the long wavelengths of heat that normally would radiate away from earth into space as infrared light.

There are five greenhouse gases: carbon dioxide (CO<sub>2</sub>), water vapor, methane, nitrous oxide and fluorinated gases. Each of these gases has a different global warming potential based on their concentration and atmospheric lifetime. Fluorinated gases are emitted in small quantities but have the high global warming potential (GWP), making it extraordinarily potent. However, it is carbon dioxide that is the primary greenhouse gas—accounting for over 81% of all U.S. greenhouse gases from human activities.<sup>3</sup> For the ease of measuring greenhouse gases, the standard unit of measure is metric tons of CO<sub>2</sub> equivalent (or MTCO<sub>2</sub>e). For any quantity and

type of greenhouse gas, CO<sub>2</sub>e signifies the amount of CO<sub>2</sub> which would have the equivalent global warming impact.

## Sources of greenhouse gases

Greenhouse Gas (Emitted)	Anthropogenic Sources <sup>3</sup>
Carbon dioxide (CO <sub>2</sub> )	Fossil fuel combustion, land use conversion, cement production
Methane (CH <sub>4</sub> )	Fossil fuels, decay of organic waste in landfills, livestock and other agricultural practices
Nitrous oxide (N <sub>2</sub> O)	Fertilizer, industrial processes, and combustion of fuels
Fluorinated gases	Industrial processes

## Global trends

Since 1880, the global annual temperature has increased at an average rate of 0.13°F per decade and over twice that rate (+0.32°F) since 1981. With an increasing rate of global annual temperature, it makes sense that the five warmest years in the 1880–2019 record have all occurred since 2015, while nine of the 10 warmest years have occurred since 2005.<sup>4</sup> The year 2016 has been the warmest year on record and 2020 was the second warmest year on record.

On the next page, you'll see temperature data from National Oceanic and Atmospheric Administration (NOAA) and National Climatic Data Center (NCDC) that support this.

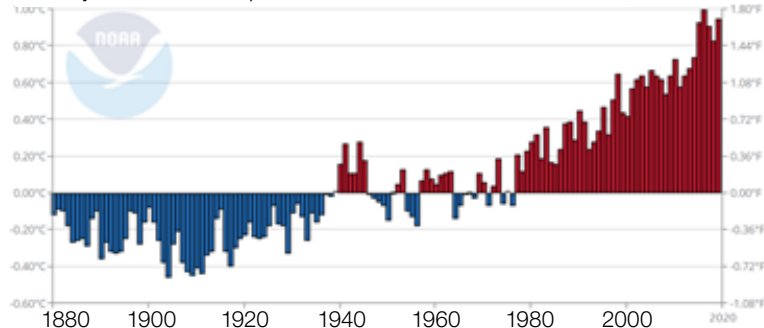
<sup>1</sup> <https://climatekids.nasa.gov/climate-change-meaning/>

<sup>2</sup> [https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc\\_wg3\\_ar5\\_summary-for-policymakers.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_summary-for-policymakers.pdf)

<sup>3</sup> <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>

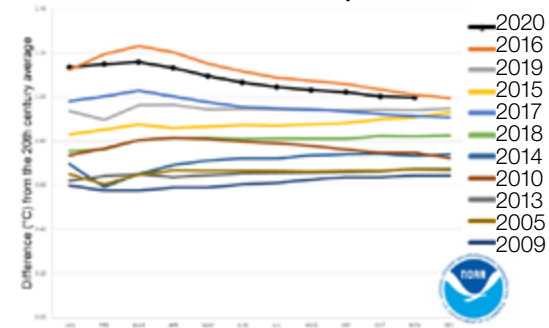
<sup>4</sup> <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature#:~:text=According%20to%20the%20NOAA%202019,more%20than%20twice%20as%20great>

## Global Land and Ocean January-December Temperature Anomalies



Source: NOAA National Centers for Environmental Information, Climate at a Glance: Global Time Series, published December 2020, retrieved on December 28, 2020 from <https://www.ncdc.noaa.gov/cag/>

## Year-to-Date Global Temperatures for 2020 and the ten warmest years on record

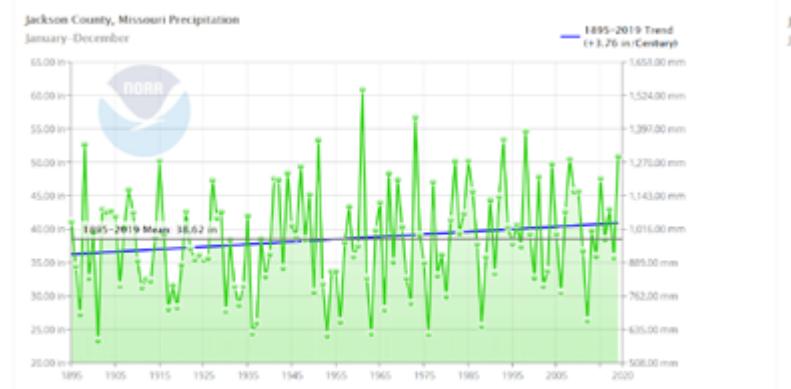


Source: NOAA National Centers for Environmental Information, State of the Climate: Global Climate Report for November 2020, published online December 2020, retrieved on Dec. 18, 2020

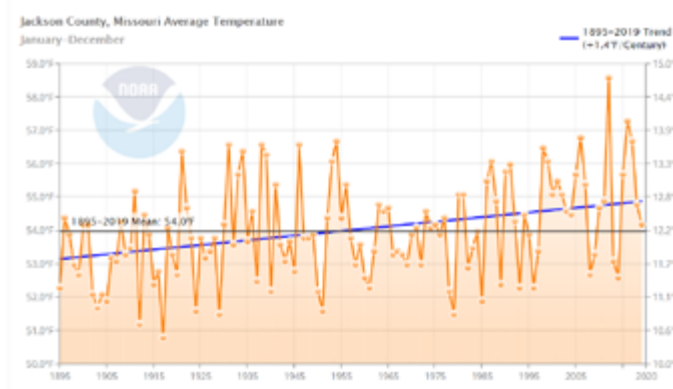
## Local Trends

Local trend data derived from temperature and precipitation readings between 1895 and 2020 from the National Oceanic and Atmospheric Administration (NOAA) show an increase in both average annual temperature and total annual precipitation for all counties in the planning area.

Averaging these trends across the 10 counties in the planning area, annual average temperature has increased 1.25°F per century. Annual precipitation has increased 3.47 inches per century. The charts below show average annual temperature and total annual precipitation and the trendline from 1895-2020 for Jackson County, Missouri.



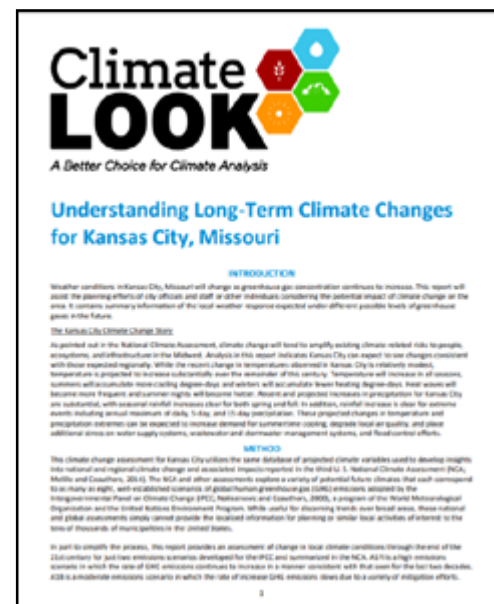
Source: NOAA National Centers for Environmental Information, Climate at a Glance: County Time Series, published December 2020, retrieved on December 18, 2020 from <https://www.ncdc.noaa.gov/cag/>



## Climate outlook for the region

The report “Understanding Long-Term Climate Changes for Kansas City, Missouri” (2016) quantifies potential changes in extreme weather in the region for 2060 and 2100 under two climate scenarios: one that projects the current trend with high greenhouse gas emission growth and a second that assumes more moderate emissions growth.

This climate change will tend to amplify existing climate-related risks to people, ecosystems and infrastructure in Kansas City and throughout the Midwest. Trends described in the report focus on expected changes in precipitation and temperature.

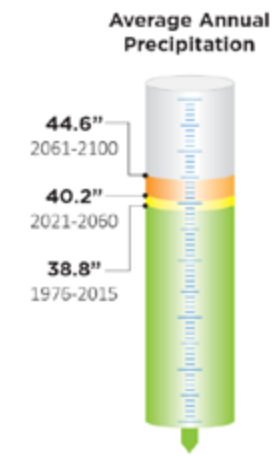


## Precipitation

Recent and projected increases in annual precipitation for the Kansas City area are substantial, with concentrated seasonal rainfall during extreme events for both spring and fall, while the length of consecutive dry days will increase substantially in summer months.

Extending current trends to 2100:

- Average annual precipitation will increase from 38.8 inches to 44.6 inches per year.
- Maximum one-day precipitation will increase from 3.4 to 4.0 inches, while 5-day and 15-day precipitation will increase from 5.5 to 7.0 inches and 7.5 to 10.4 inches, respectively.
- The number of days with more than 1.5 inches of precipitation will increase from 5.0 to 9.3.
- The maximum number of consecutive dry days will increase from 30.9 to 39.5 days/year

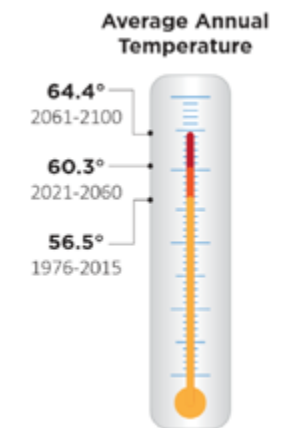


## Temperature

While recent changes in temperatures observed in Kansas City have been relatively modest, temperature is projected to increase substantially in all seasons over the remainder of this century. Heat waves will become more frequent and summer overnight lows will become hotter.

If current trends continue, by 2100:

- The average annual temperature will increase from 56.5 degrees to 64.4 degrees Fahrenheit.
- The number of days/year in which the temperature exceeds 105 degrees Fahrenheit will increase from 0.7 to 21.9.
- The number of cooling degree days, a reflection of the demand for energy needed to cool a building, will nearly double. Conversely, energy demand for heating will decline by 27%.
- The last spring frost is projected to be more than two weeks earlier, whereas the first fall frost will occur about 11 days later.



Projected changes in temperature and precipitation extremes can be expected to increase demand for summertime cooling, degrade local air quality and place additional stress on water supply systems, wastewater and stormwater management systems, and flood control efforts. Near-term climate resilience efforts might be best focused on water systems than on heat adaptation because changes in rainfall are already present and expected to continue, while rising temperatures are an emergent change.

Another report, “Risky Business: The Economic Risks of Climate Change in the United States,” suggests increased heat will lead to an increase of 5.3% in violent crime solely due to higher temperatures, decreased labor productivity of 2.3% and increased energy demand of 8% to 19%



## Potential impacts of climate change in the region

Natural Systems	Infrastructure and Built Environment	Human Health
<ul style="list-style-type: none"> <li>• Decreased air quality</li> <li>• Decreased water quality</li> <li>• More heat stress for crops and livestock</li> <li>• Wider spread of pests</li> <li>• Loss of tree canopy</li> <li>• Declining biodiversity and ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>• Increased severe weather damages to buildings and infrastructure</li> <li>• Impaired performance and longevity of buildings and infrastructure</li> <li>• Intensified urban heat island effect</li> <li>• Increased pressure on urban drainage systems</li> <li>• Increased heating and air conditioning load</li> <li>• Disrupted transportation and communication networks</li> </ul>	<ul style="list-style-type: none"> <li>• Increased asthma and other respiratory diseases due to pollution</li> <li>• Increased respiratory allergies</li> <li>• Increase heat-related illness or deaths</li> <li>• Increase injuries and fatalities due to severe weather</li> <li>• Increased water-, air- and vector-borne diseases</li> <li>• Malnutrition</li> <li>• Decreased work capacity</li> <li>• Increased conflict and crime</li> <li>• Mental health and stress-related illnesses</li> <li>• Reduced physical activity</li> </ul>



# Climate Change, Equity and Justice

Climate change is an equity issue. Increasing temperatures and precipitation in the Kansas City metropolitan area pose a threat to all residents and infrastructure. However, these climate impacts can perpetuate and even aggregate existing social inequity, causing disadvantaged groups to suffer disproportionately more from climate impacts and exacerbating future inequality<sup>1</sup>. Reconciling these challenges brings climate change into the realm of climate justice, where ethical and political issues are considered alongside environmental concerns in the conversation around climate adaptation and resiliency.

Social inequity is complex and context specific. Variation persists across economic and demographic characteristics, including race, gender, ethnicity, religion, age, income, and access to political power and public resources. These inequities often also overlap with regional or spatial inequity within and across borders. Some inequity exists because of discriminatory policies and practices that have advantaged some communities while neglecting or disadvantaging others. A clear example of this is redlining—the discriminatory practice of rating neighborhoods based on their racial character and environmental conditions popularized by the Home Owners Loan Corporation (HOLC) in the 1930s.

This practice encouraged investment and development of some communities while denying others access to wealth-generation strategies like homeownership. Over time, discriminatory practices like redlining changed the landscape of communities across America, giving some communities access to the means to create intergenerational wealth, while others were left to deal with the direct and indirect consequences of intergenerational poverty. This history of discrimination and inequity is made worse

by the fact that wealthy individuals and countries are disproportionately responsible for the GHG emissions that are now driving changes in average temperature and rainfall.

Like inequity, climate vulnerability and risk are unevenly distributed across the population, both within countries and across borders. In general, economically disadvantaged and socially marginalized populations are both more vulnerable to climate impacts and at higher risk of suffering negative impacts to their health and financial sustainability. There are three primary mechanisms for the persisting inequity in climate impacts<sup>1</sup>:

1. Disadvantaged groups are more likely to be exposed to the adverse impacts of climate change.
2. Disadvantaged groups are more susceptible to damage caused by climate change.
3. Disadvantaged groups are less able to cope with and recover from damage caused by climate disaster.

The primary determinant of exposure is location, especially proximity to high-risk areas. For disadvantaged communities who live or work in flood plains, arid regions or communities without adequate tree cover, their risk of climate-related disaster is much higher than communities situated on higher ground or those shaded by trees and other cooling assets. Disadvantaged communities are often situated in these high-risk areas because they lack the resources to move to safer areas or because they have been systematically shut out of safer areas, as was the case with redlining. This situation holds in both rural and urban settings.

Even for communities with similar levels of exposure, access to resources and political power gives advantaged communities the opportunity to rapidly



Firestation Rooftop Solar Panels  
Photo Courtesy of Westside Housing Organization.

<sup>1</sup> [https://www.un.org/esa/desa/papers/2017/wp152\\_2017.pdf](https://www.un.org/esa/desa/papers/2017/wp152_2017.pdf)

adapt and become more resilient. For example, higher-quality housing stock or access to heating and cooling can alleviate the worst climate-related impacts for those with the means to acquire them. Those without the means are often left to weather the worst climate impacts.

Finally, economically disadvantaged and socially marginalized communities often have less access to private, community and public resources for mitigation, response and adaptation efforts. As a result, recovery is often slow or comes at the expense of future adaptive and growth capacity<sup>1</sup>.

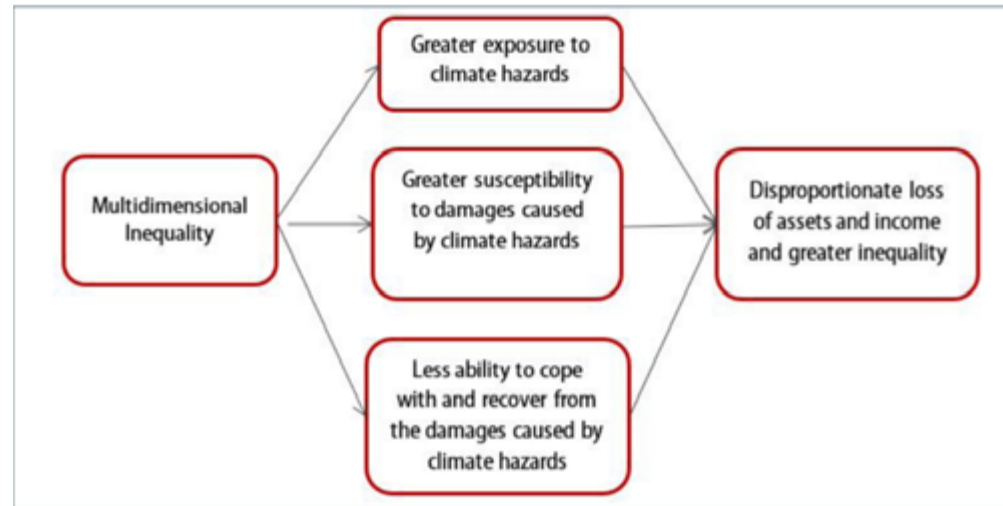
These mechanisms work independently and collectively to create negative feedback loops and regressive cycles, where disadvantaged communities are more heavily impacted by climate

change than wealthy communities, who often have the resources and political power to recover faster. For example, increasing precipitation, especially during high-intensity rainfall events, is expected to contribute to increased flooding in the Kansas City metropolitan area.

Disadvantaged groups located in low-lying areas will be more exposed to overland and riverine flows and will bear the brunt of the damage caused by flooding. Lower-quality housing stock may result in more damage and fewer available resources will result in a disproportionate loss of physical, human and social assets. For this reason, disrupting the regressive cycles and negative feedback loops between climate change and inequity is a necessary part of climate planning and resiliency efforts.

Climate change and the persisting challenges around social and economic inequity give us an opportunity to build back better, especially because natural disasters and emergency situations often create opportunities to try strategies that may not gain traction under normal circumstances<sup>1</sup>. As a result, a concerted effort is necessary to both reduce social inequity and address climate impacts. This plan aims to do just that, by recommending policy and creating more resilient systems to increase the quality of life for all Kansas City metropolitan residents.

### Three effects of inequality on disadvantaged groups



Source: Islam, Nazul S. and Winkel, John. (2017) Climate Change and Social In Equality, United Nations Department of Economic and Social Affairs

# GHG Emissions Inventory

## Regional GHG Inventory: Stationary energy, solid waste and transportation sectors

This Greenhouse Gas (GHG) Inventory represents the best estimate of regional CO<sub>2</sub>e emissions for the 10-county planning area. It includes emission estimates associated with stationary energy generation, solid waste and surface transportation.

Stationary Energy	Transportation	Waste
<p><b>Natural Gas and Steam</b></p> <ul style="list-style-type: none"> <li>• Spire Energy Kansas Gas Service (ONE Gas)</li> <li>• Atmos Energy</li> <li>• Veolia</li> </ul> <p><b>Electricity</b></p> <ul style="list-style-type: none"> <li>• KCP&amp;L</li> <li>• IP&amp;L</li> <li>• Westar Energy</li> <li>• KCBPU</li> <li>• City of Gardner</li> </ul> <p>Through cooperation with regional energy providers, we have gained a good cross-sectional understanding of the sources contributing to the total emissions generated. Future work will entail acquiring more detailed annual data associated with closer alignment to our specific geographic area.</p>	<p><b>Passenger vehicles, freight trucks and public transit modeled in the MARC Regional Transportation Model</b></p> <p>Emissions from the transportation sector are limited to on-road contributions. Railroads, off-road/construction and non-vehicular airport-based emissions have not been assessed for this inventory. Waterway port emissions are also typically included within a greenhouse gas inventory. However, the water port, being re-established in the Kansas City area, received its first barge traffic in August 2015. Therefore, while the emissions associated with the port do not contribute a prominent source of GHG for the baseline inventory, this element of the transportation sector will require monitoring as traffic is quickly expanding.</p>	<p><b>Waste disposal tons sent to in- and out-of-region landfills</b></p> <p>Our understanding of solid waste emissions within the greater Kansas City region has been well documented for more than 10 years. Estimates for the GHG contributions related to this sector have been evaluated to account for solid waste produced locally and outside the region and disposed within the study area, and the solid waste exported from our region and disposed elsewhere.</p>

<sup>1</sup> [https://www.un.org/esa/desa/papers/2017/wp152\\_2017.pdf](https://www.un.org/esa/desa/papers/2017/wp152_2017.pdf)

## Greenhouse gas emissions and data sources by sector

### Stationary Energy:

Information about energy use, fuel mix and population served was provided by the two natural gas and the major electric utilities serving the region as well as several electric co-ops and municipal units contracting directly with larger, multi-state regional power pools.

With this rich dataset, we were able to address minor issues with geographic data gaps and slight differences in reporting dates. Residential data was separated from institutional, commercial and industrial data, but the remaining data was combined and included energy associated with both building facilities and any manufacturing processes.

Future efforts will be made to separate the non-residential cluster and isolate the energy used for manufacturing processes. As we clarify how this energy is used, more effective policies and modifications of existing processes can be identified and implemented.

### Transportation:

Baseline data were estimated using the EMME transportation model with associated land use and street grid patterns for the 2015 baseline year, and the EPA MOVES 2014b modeling program was then used to determine subsequent 2015 baseline emissions. MOVES defaults were used for fuel characteristics (regional), meteorological conditions (regional), vehicle age profile (national), number of vehicles by type (bi-state regional estimate), average speed distribution (national) and vehicle age (national).



Outputs from EMME were used to define the road type distributions, and ramp fractions compared with the tri-annual 2014 EPA emissions inventory and EPA generated run specs for Kansas counties in the MARC region. The estimates we produced compared favorably with a variance of between -3.8% and 1.8%.

As an element of the 2050 long-range transportation plan, future transportation demands were modeled based upon a range of expected land use patterns, investment policies and regional infrastructure priorities. We then ran the MOVES model using those future demand estimations and the supplied 2050 default estimates for transportation sector GHG emissions.

### Waste:

Regional landfills are required to regularly report information to the states on the volume of solid waste processed and the composition of the mixture of materials, as well as the location of its final disposition.

Traditionally, this detailed information has been used to monitor usage and determine estimated lifespan of facilities to plan for future regional needs. However, these data also provide a high-quality picture of the greenhouse gases generated by the sector.

While greenhouse gas monitoring was not part of the reporting structure in 2005, beginning in 2010 there was increased focus on data collection and, by 2012, facility reporting had become much more comprehensive.

## Emissions by sector 2005-2015: Baseline estimate and benchmark

For clarity and confidence, we used 2015 as our benchmark year and backcasted to 2005 based on population change. This resulted in a very conservative estimate of our decrease in emissions since 2005 because the GHG emissions per capita in 2005 were undoubtedly higher than in 2015. Nonetheless, we took this approach because prior to 2010 the available data on GHG emissions are fragmented and imprecise.

### Stationary energy:

Producers and distributors of both electricity and gas have been consolidated, split and rearranged multiple times in the decade between 2005-2015. This has deeply fragmented available data. In addition, data collection specific to greenhouse gas was less rigorous in QA/QC and the data were not sufficiently granular to allow data to be filtered for our region. However, by 2015, the energy providers' organizational structure had become more stable and data were being carefully reviewed and tracked.

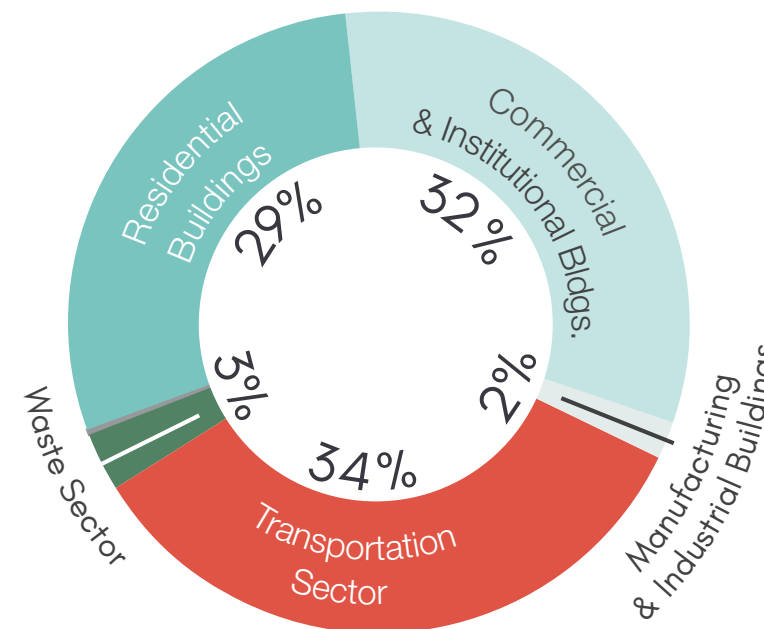
### Transportation:

Prior to 2010, EPA used the MOBILE6 emissions model. It did not calculate greenhouse gases directly but provided a fuel economy number which could then be used to estimate GHG by vehicle type (EPA 420-F-05-004). This rough estimate could then be used with travel model outputs to provide a value for GHG emissions.

The first MOVES model came out of the EPA in 2010 and its update to 2010b in 2012 provided the first integrated GHG emissions modeling. Released in 2014, MOVES2014 provided an improved platform and updated default variables reflecting the latest engine standards. The estimates currently used in this plan were generated using MOVES2014. The latest EPA model, MOVES3, was released in November 2020 and will be used in future updates.

### Solid waste:

Regional landfills were able to react fairly quickly to produce GHG estimates because facilities were smaller in size and scope, and they already collected data needed for calculation inputs. However, robust calculating and tracking of GHG emissions really began in earnest following the 2009 endangerment finding for greenhouse gases.



## Greenhouse Gas Inventory results 2015

### Stationary energy:

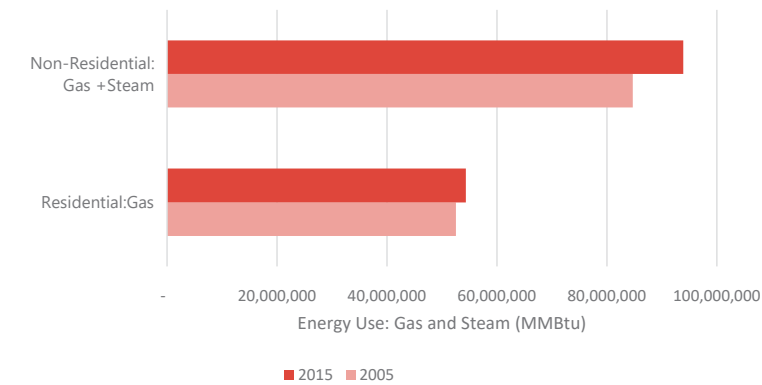
GHG emissions associated with stationary energy use are estimated to be 18,862,000 tons of carbon dioxide equivalent (CO<sub>2</sub>e) per year, representing nearly two-thirds of the regional GHG contribution. Driven by the fuel mix used to provide this power and regional energy demand, successful reduction in these emissions will require a combination of both ongoing investment in renewable/sustainable energy and improvements in building energy efficiency.

Direct combustion of coal for district heating only results in about 249,000 T-CO<sub>2</sub>e/yr and natural gas emits 4,638,000 T-CO<sub>2</sub>e/yr of GHG. In these dedicated utilities, fuel switching opportunities are limited. However, grid-based electrical power use accounts for most of the energy provided to the region with an equally large level of 13,348,000 tons CO<sub>2</sub>e/yr in emissions. Between 2005 and 2015, Evergy, the regional electric utility, has heavily invested in renewable power. Successful reduction in regional GHG will rely heavily on implementation of their Sustainable Transformation Plan. In addition, during this 10-year period, all utilities have undertaken infrastructure maintenance and replacement programs to minimize leakage and transmission losses associated with distribution of power and natural gas.

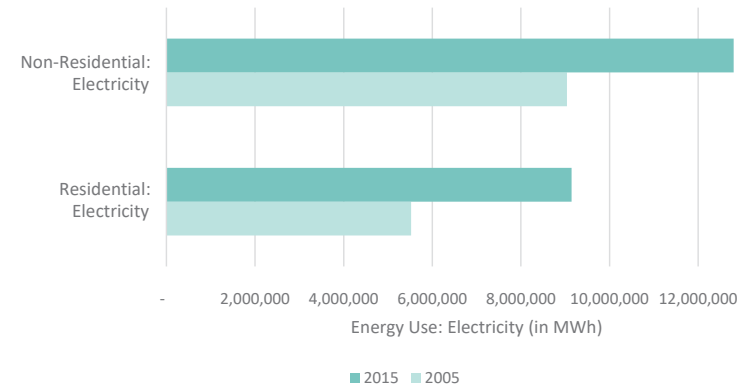
When considering the demand for energy, it becomes more useful to review the stationary energy emissions by end-user sectors. Review of the inventory shows that emissions related to commercial and institutional facilities are estimated to be 9,665,000 metric tons CO<sub>2</sub>e/yr, slightly higher than the 8,723,000 metric tons CO<sub>2</sub>e/yr for residential buildings. Emissions resulting from manufacturing and construction processes are difficult to currently ascertain with accuracy because reporting from electricity utilities combines this power use with the overall facilities and environmental controls. However, partial quantification of the emissions derived from natural gas supporting these activities indicates an initial level of about 464,000 metric tons CO<sub>2</sub>e/year. Adoption of 2012 energy codes for new building construction, promotion of Energy Star appliances, use of more efficient lighting technology and weatherization programs supported between 2010 and 2015 all contributed to a reduction in GHG emissions between 2005 and 2015. However, significant opportunities continue to exist for energy efficiency particularly with improvement of the building envelope (insulation, windows and excess leaks/ventilation). Improvement of residential structures offers a higher greater benefit than commercial structures, but they are widely understood to be more difficult to achieve. Similarly, bringing existing out-of-date structures up to code provides a greater relative reduction

than an incremental improvement associated with implementing a tighter energy standard on new construction. Updating or retrofitting existing building stock is often much more challenging due to policy constraints, community support, funding and enforcement.

### Gas and Steam Consumption



### Electricity Consumption



### Transportation:

On-road transportation produced just over one-third of the region's GHG emissions at 10,159,000 metric tons CO<sub>2</sub>e/yr. National fuel efficiency standards for passenger vehicles and heavy-duty trucks improved dramatically between 2005 and 2015 with advancement improvements accelerating after 2007. Continued reduction in transportation emissions will require both improvement in vehicle technology, fuel switching, sustainable land use and behavior change.

In the near- to mid-term, research and innovation into battery capacity, advanced engine design and other fuel efficiency refinements represent a critical part of reducing transportation emissions. However, fuel efficiency efforts will wane over time and switching to clean, renewable fuel will become

much more important. Committing to low-carbon urban design, public transit investment, carpooling and shifting away from motorized transportation represent a small but resilient strategy for decreasing emissions. By 2050, design and changing transportation behavior could account for over 25% of ongoing emissions reduction.

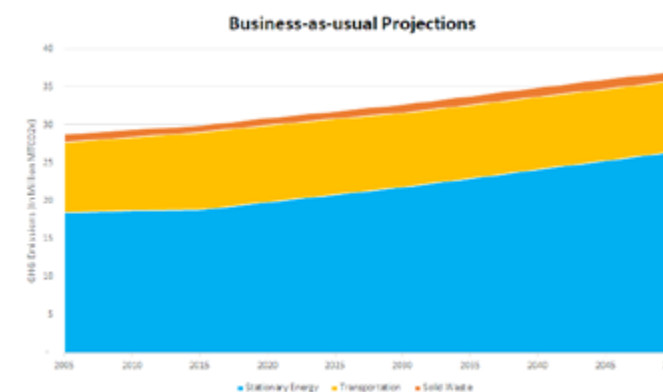
### Waste:

GHG emissions due to solid waste disposal in 2015 are estimated at 886,000 metric tons CO<sub>2</sub>e/yr. In 2008, the regional solid waste district embraced a goal to achieve 80% waste diversion by 2023 using stepwise goals of 40%, 60% and 80% with a stretch goal of zero-waste by 2028. While ambitious, the region has taken strong, positive strides in this direction between 2008 and 2015. Continued efforts to divert paper and plastic, and expansion of composting collection are being made in concert with development of innovative businesses, which utilize recycled products and compost as feedstock.

## Business-as-Usual Projections

A Business-as-Usual (BAU) projection uses locally specific parameters like population growth or gross domestic product (GDP) growth projections to model future emissions in the planning area. A BAU projection allows us to see what will happen to GHG emissions in the region if we do not act.

Based on this projection, GHG emissions are estimated to increase by 28% from the 2005 base year to 37 million MTCO<sub>2</sub>e by 2050 if no actions are taken. These projections are based on current population and transportation emissions forecasts for the MARC region.



## Target emissions reduction

Meeting a “net zero by 2050” target means that the region will need to reduce this projected 42 million MTCO<sub>2</sub>e through reduced emissions and the drawing down of greenhouse gases already in the atmosphere through sequestration technology.

# Climate Risk & Vulnerability Assessment

In addition to completing a greenhouse gas inventory, an assessment of climate risks and vulnerabilities is completed. The purpose of the Climate Risk and Vulnerability Assessment (CRVA) is to develop an understanding of the current and future climate risks facing the region to inform the inclusion of adaptation goals and actions in the Regional Climate Action Plan. The CRVA also helps to the stage for future community discussions as the goals and actions in the plan are refined and implemented.

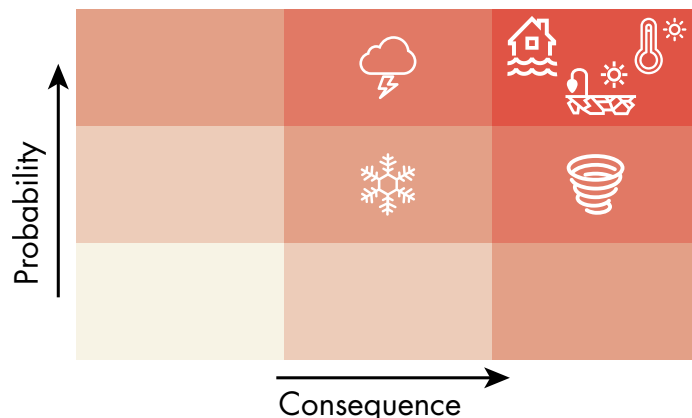
This CRVA represents a high-level regional-scale assessment of risks and vulnerabilities. It is recommended in this plan that local governments conduct more detailed assessments for their own jurisdictions.

## Hazards

Understanding the natural hazards that pose the greatest risks to the Kansas City region is critical to discussions about vulnerability and how plans support the region's ability to adapt and stay resilient in the face of these hazards. In 2019, MARC began updating its Hazard Mitigation Plan for the Missouri counties in our region. **The Hazard Mitigation Plan** (2020) identifies those hazards that pose the greatest risk to our region: flooding, extreme heat (>105°F), drought, severe thunderstorms, severe winter weather, and tornadoes. The plan also includes information on the experience of the community with these hazards, local government capabilities to address or reduce the risks, and goals and actions local jurisdictions are willing to take over the next 5 years. Two additional hazard mitigation plans are available for the Kansas counties in the planning area: **Douglas County Hazard Mitigation Plan** and the **Kansas Homeland Security Region L Hazard Mitigation Plan**.

## Risk matrix

The risk level assigned to each hazard informs the prioritization of the most at-risk assets, systems, and groups. Risk is determined based on the probability and consequence of a particular hazard. For each hazard, a number is assigned to both probability and consequence and multiplied to assess the risk level. The following risk matrix summarizes the risk level for each hazard and how they compare to one another. Based on this methodology and information from the 2020 Hazard Mitigation Plan, the hazards with the highest level of risk for the region are flooding, heat, and drought, with flooding considered the greater risk as the region is already experiencing increased flooding events and associated damage. Severe thunderstorms, tornadoes, and winter weather have slightly lower risk levels but still are considered significant. For the purposes of the Climate Action Plan, more focus is given to adaptation strategies for flooding, heat, and drought.



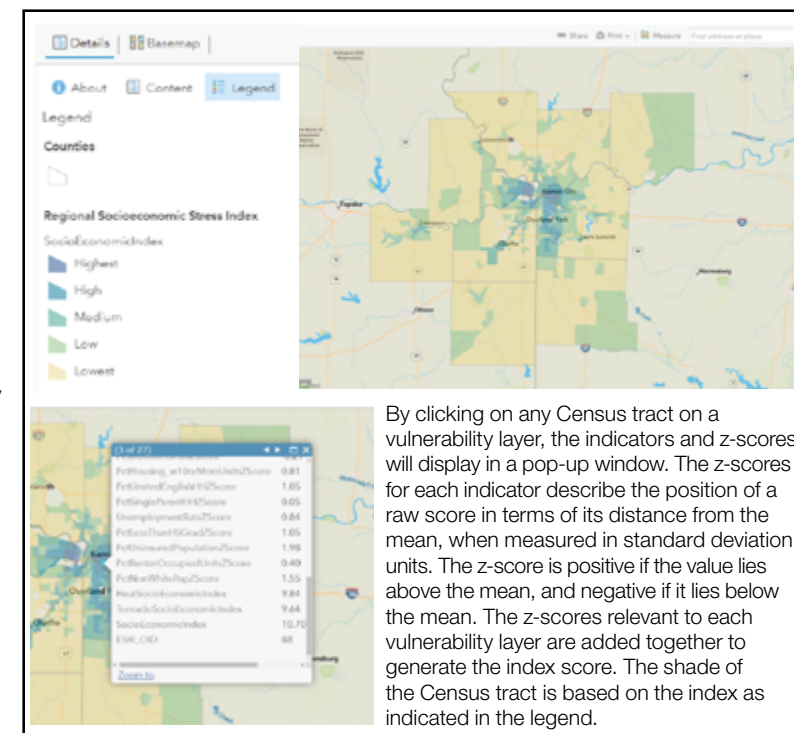
## Vulnerability assessment

This assessment helps answer questions about where our most vulnerable communities exist in the region and the magnitude of social vulnerability, in general. The findings help inform planning, equity-

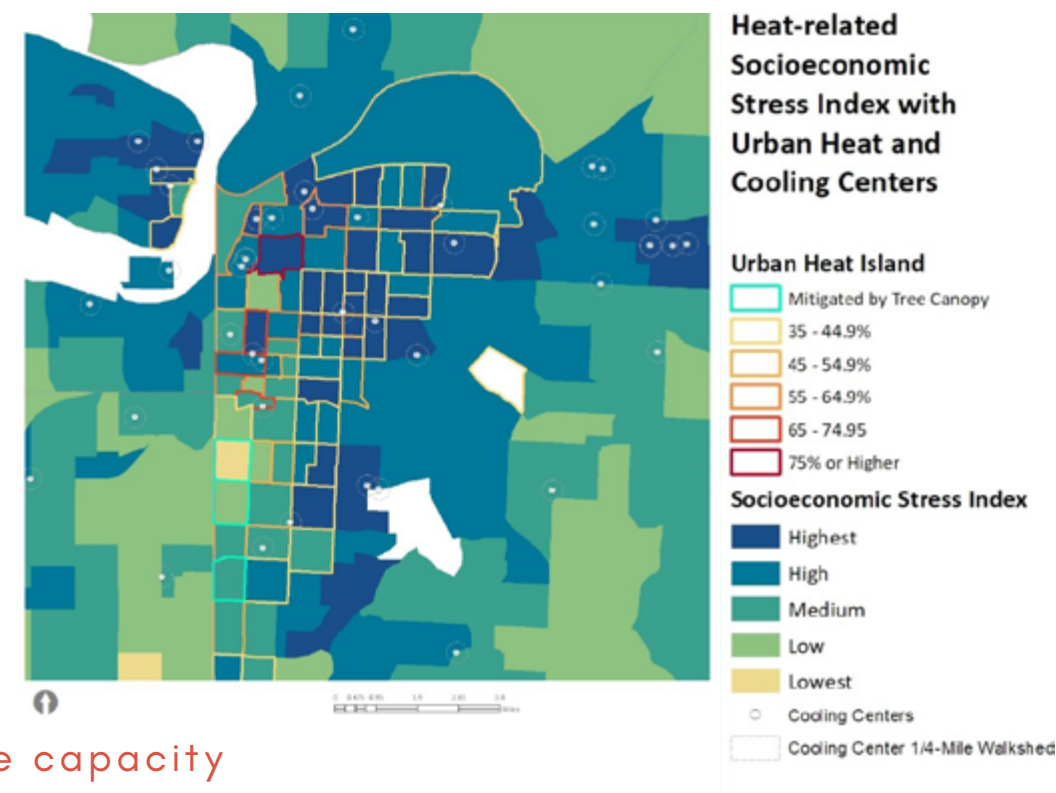
focused engagement and relationship building, and where climate initiatives must be prioritized and targeted. In this assessment, several indicators are used to help pinpoint geographies of overlapping vulnerabilities related to climate change. The vulnerability maps are based on indicators specific to the priority hazards. More information about these chosen indicators can be found in the CRVA in the appendix. These maps explore social vulnerability, and vulnerability related to flooding, heat and urban heat island, and tornadoes.

## Interactive map tool

An interactive map, including the vulnerability and neighborhoods layers, was created to support local government climate resilience initiatives and can be found [here](#).



By clicking on any Census tract on a vulnerability layer, the indicators and z-scores will display in a pop-up window. The z-scores for each indicator describe the position of a raw score in terms of its distance from the mean, when measured in standard deviation units. The z-score is positive if the value lies above the mean, and negative if it lies below the mean. The z-scores relevant to each vulnerability layer are added together to generate the index score. The shade of the Census tract is based on the index as indicated in the legend.



## Adaptive capacity

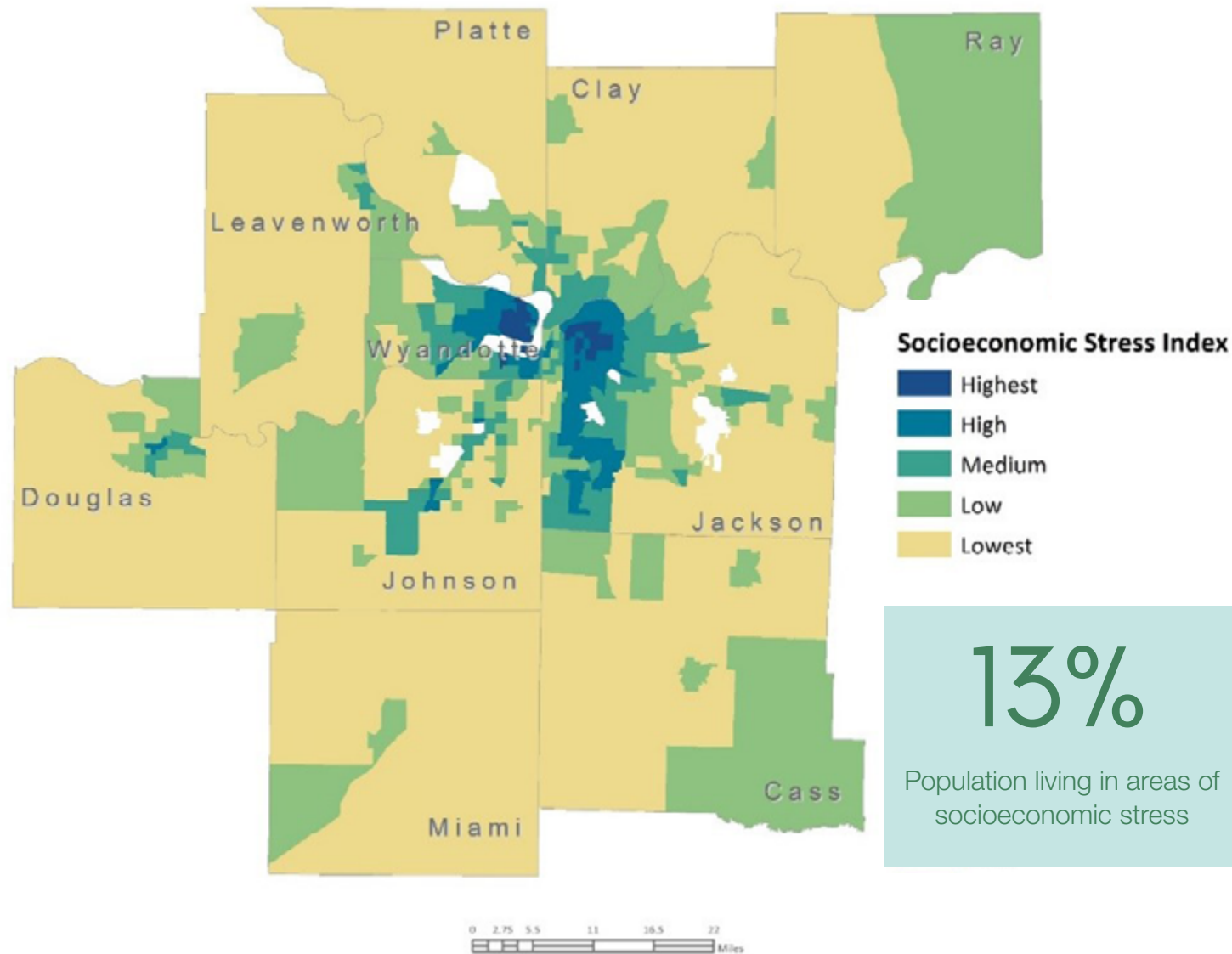
A high-level adaptive capacity assessment was conducted to identify certain factors that may pose as challenges to adaptation. The different factors are divided into six categories: built environment, economy, environment, government capacity, inequity and public health. The assessment of the factors within each category was informed in part by community feedback, as well as qualitative research.

The factors with the highest degree of challenge included infrastructure condition and maintenance, housing, land use and development, access to education, budgetary capacity and poverty/income. There are many factors that are ranked "moderate" in terms of degree of challenge in this assessment that may warrant further research.

## Regional socioeconomic stress

Areas of socioeconomic stress were determined by factoring five vulnerability indicators into an index: non-white population, population below 200% of poverty, population under age 5, population over age 65, and renter-occupied housing. While there are many indicators of socioeconomic stress, this set of indicators is commonly used in vulnerability assessments and provides a solid foundation for understanding socioeconomic stress at a regional level. Local governments may want to add additional indicators based on local context.

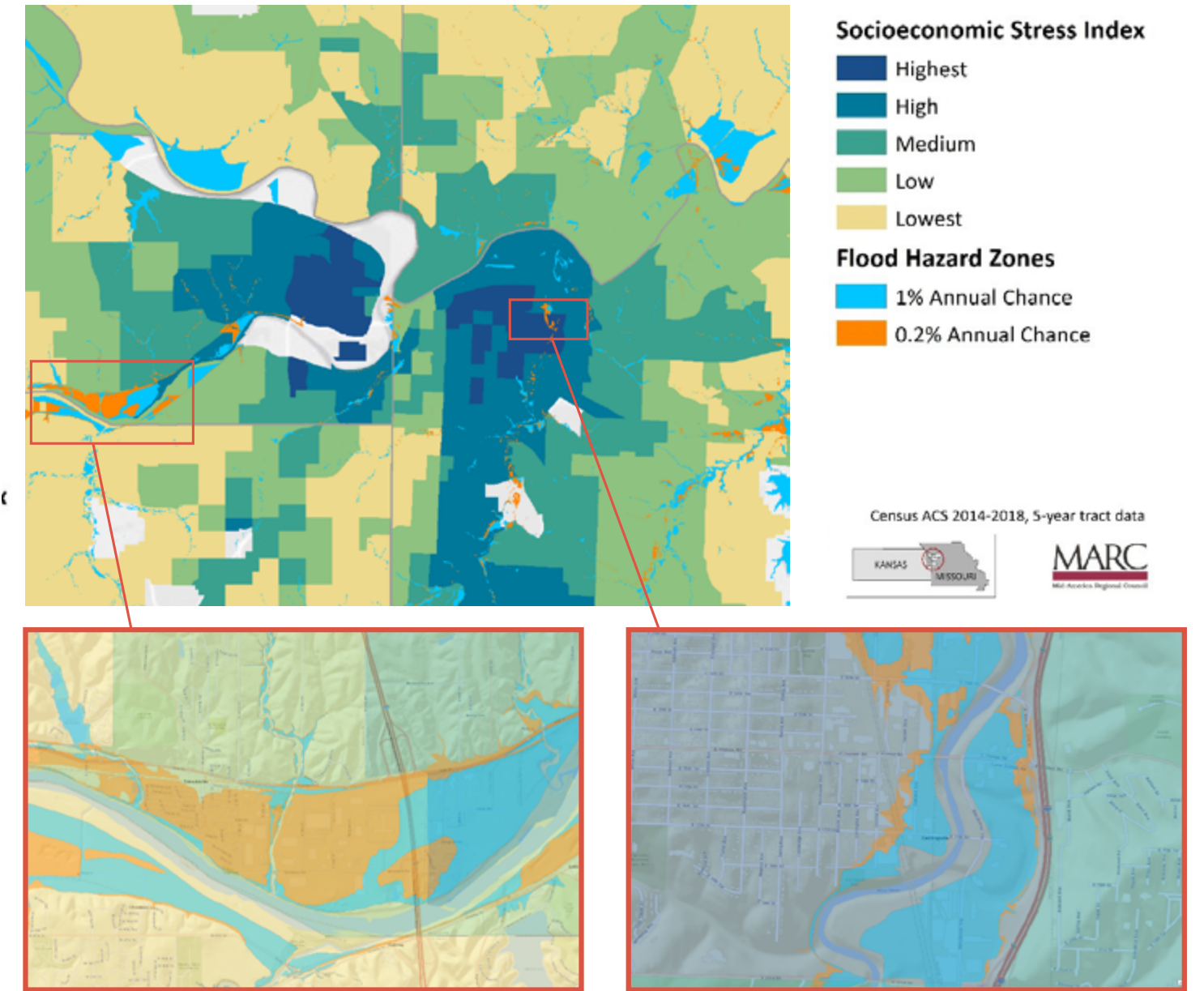
Within the planning area, 13% of the total population lives within census tracts that are considered “highest” or “high” in terms of socioeconomic stress. These census tracts are primarily located in the urban cores of Kansas City, Kansas, and Kansas City, Missouri. However, there are portions of Shawnee, Kansas, and Lenexa, Kansas, along the I-35 corridor and Olathe, Kansas, and Lawrence, Kansas, that have socioeconomically stressed areas, as well.



## Flooding and socioeconomic stress

Comparing the 100- and 500-year floodplains to areas of high socioeconomic stress can highlight flood vulnerabilities and significant needs for intervention. There are few areas where socio-economically stressed areas intersect floodplains. However, these areas still warrant further exploration. In the snapshots below, the Centropolis

neighborhood in Kansas City, Missouri, which is highly socioeconomically stressed, shows the 500-year floodplain (orange area) encroaching on residential housing. In the snapshot showing the City of Edwardsville, Kansas, while considered low for socioeconomic stress, has significant vulnerabilities to 100- and 500-year flooding.



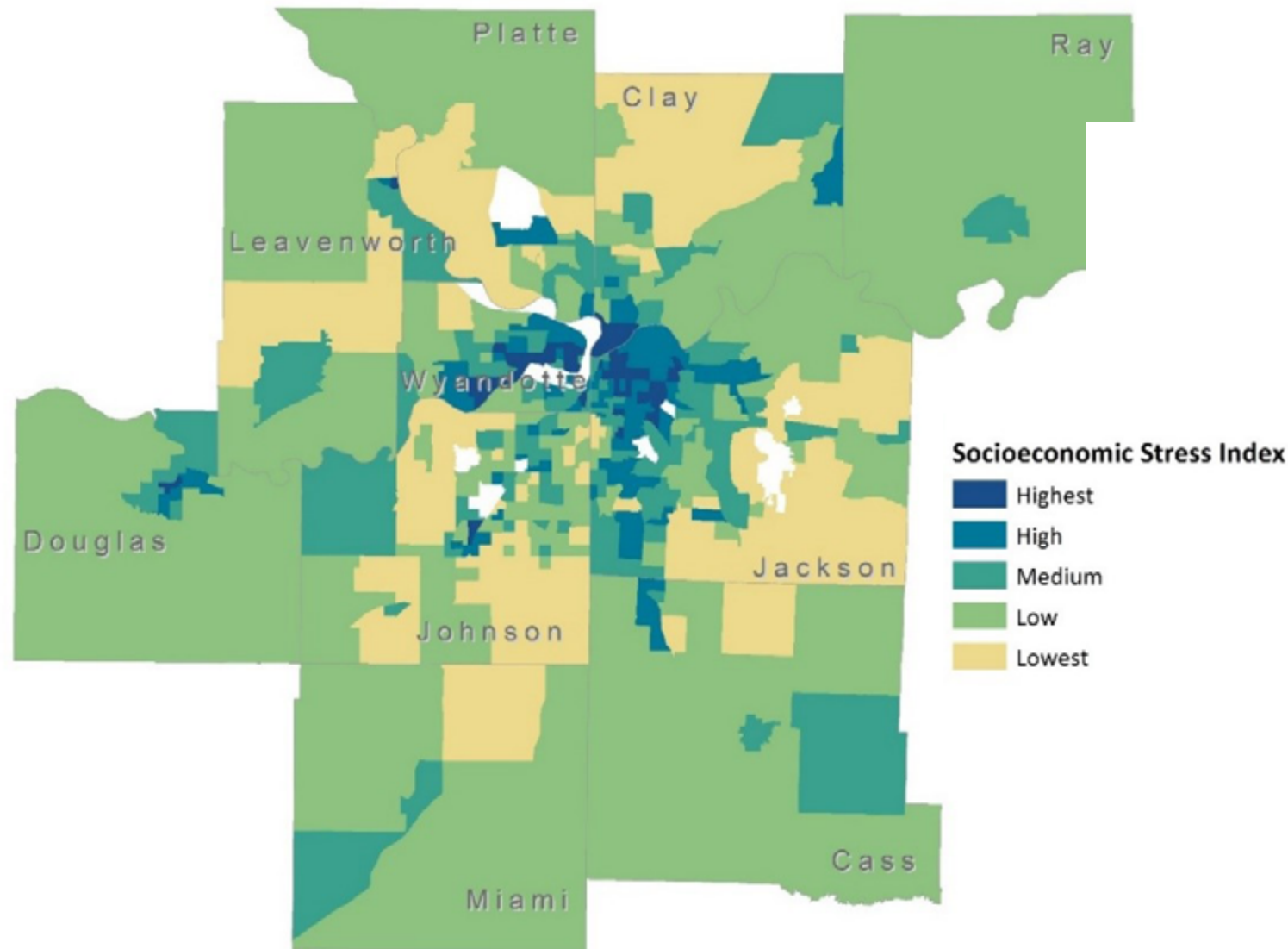
Edwardsville, KS

Centropolis neighborhood in Kansas City, MO

## Tornado-related socioeconomic stress

Tornado vulnerability indicators focus on accessibility, housing density and protection, language and socio-demographics. Due to the distribution of multi-family housing, disabilities and older adults, tornado vulnerability is more widespread throughout the region.

However, visually, it is apparent that tornado vulnerability is concentrated in the urban cores of Kansas City, Kansas, and Kansas City, Missouri. About 19% of the population lives in census tracts that are considered “highest” or “high” socio-economically stressed.



**19%**  
Population living in areas of tornado vulnerability

## Heat-related socioeconomic stress

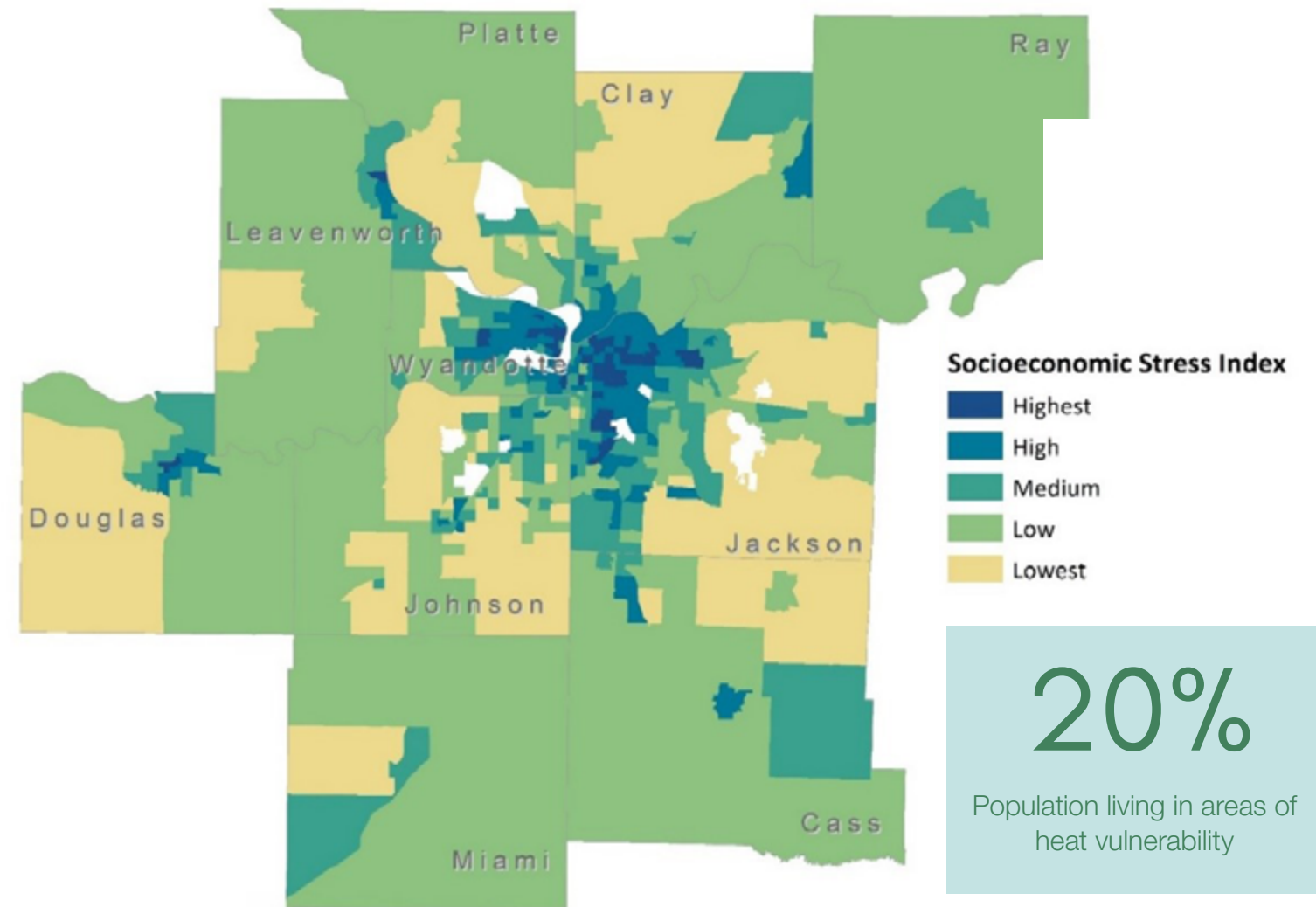
Heat vulnerability is concentrated in older, developed areas of the region where poverty tends to be highest—namely the urban cores of Kansas City, Kansas, and Kansas City, Missouri. Every county within the planning area has a least one census tract that is rated “medium” or higher for heat vulnerability. The percentage of the population living in highly vulnerable areas (highest and high) is approximately 20%.

In addition to spatially identifying heat-vulnerable areas, it is important to look at areas that may experience the added vulnerability of urban heat island effects. Urban heat islands have a tendency for higher air temperatures persisting in urban areas as a result of impervious, heat-absorbing infrastructure (e.g. buildings and asphalt) and less tree canopy coverage, tending to make cities

warmer than the surrounding countryside.

In addition to heat-related socioeconomic stress, the second map identifies census tracts that have landcover that is 35% or more impervious surfacing plus mitigating tree canopy coverage (40% or greater in tree landcover).

Vulnerability to urban heat is only highlighted in Kansas City, Kansas, and Kansas City, Missouri. The areas of both highest heat-related socioeconomic stress and urban heat vulnerability exist on the Main Street corridor in Kansas City, Missouri. While the Main Street corridor does not intersect with areas of high socioeconomic vulnerability, the corridor is the economic center of the region and used for recreation, shopping, medical services, transit connections and more.



**20%**  
Population living in areas of heat vulnerability

## Summary of findings and recommendations

### Key findings:

- Flooding and extreme heat will pose the greatest risks to the Kansas City region in the near term.
- Urban heat island impacts are concentrated in the downtown/urban core of Kansas City, Missouri. Urban heat could significantly impact the health of individuals who have higher exposure to heat and households in low-income communities, especially where substandard housing is prevalent and tree canopy is minimal.
- Race and poverty are dominant indicators of socioeconomic stress and overall climate vulnerability. Racial and economically concentrated areas of poverty are prevalent in the urban core of the region.
- Our regional adaptive capacity will rely on large-scale, system-wide transformation that positively impacts the built environment, access to opportunities and quality of life.

### Adaptation Priorities:

1. Focus on adaptation efforts in areas that support greater resilience for vulnerable communities.
2. Address contributing factors to the urban heat island effect and expand comfort resources for residents, such as cooling centers, shade structures, trees and native vegetation.
3. Encourage localized assessments of 500-year flood risks and identify mitigation strategies as required.

### Recommendations for next steps:

1. Map critical assets (transportation systems, electric grid, hospitals, etc.) across the region in relation to areas where hazards may pose the greatest risk.
2. Refine vulnerability indicators by integrating regional health data and resource accessibility (e.g. proximity to cooling centers, food, health care, etc.).
3. Communicate about risks and preparedness needs to support resilience.
4. Integrate climate action into emergency preparedness.
5. Encourage local jurisdictions to evaluate climate risks, critical infrastructure and localized socio-economical vulnerability within a local context.
6. Update the CRVA by 2024.



## GHG Target

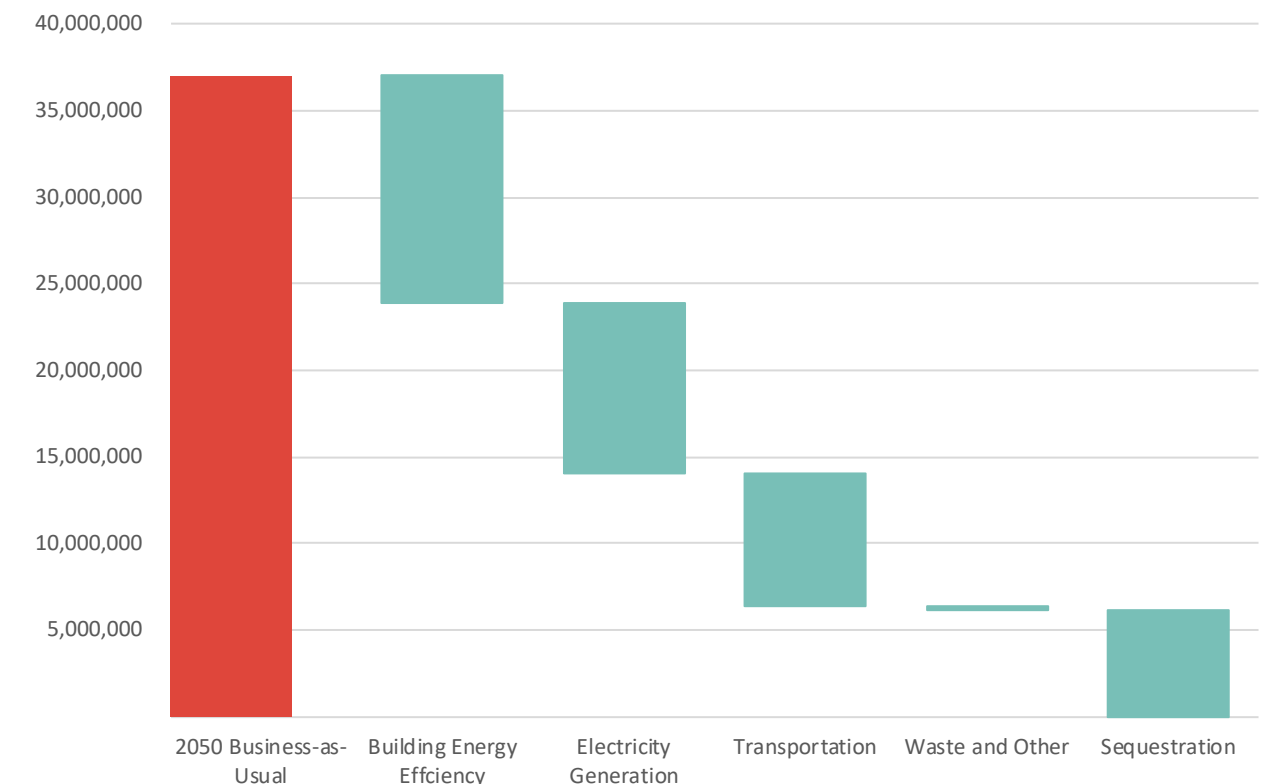
### NET ZERO BY 2050

- Net zero GHG emissions for local government operations by 2030
- Net zero GHG emissions for energy generation by 2035
- Net zero GHG emissions from homes and buildings by 2040

### How will we meet our target?

1. De-carbonizing the electric power grid.
2. Transitioning to electric vehicles, mode shift and sustainable development.
3. Optimizing the energy performance and health of buildings and homes.
4. Diverting food and landscaping waste from the landfill.
5. Sequestering carbon in the soil through green infrastructure conservation and restoration.

### Breakdown of CO<sub>2</sub>e reduction by action area





Energy. Water. Food. Ecosystems. Transportation. Public health. Entrepreneurship and innovation. Waste. Governance.

The Climate Action Plan takes an integrated, systems-based approach to addressing climate change. The complexity of climate change requires an understanding of interrelationships across sectors. Ideally, every proposed solution will elegantly solve more than one problem at a time, creating a long list of cobenefits for people, nature and the economy.

We might start with an aphorism. Eat healthy and exercise. Our plan builds from common sense and then asks how to scale up and connect. Many examples illustrate this thinking.

- Walkable, bicycle-friendly neighborhoods improve public health and social cohesion, while also decreasing emissions in a way that explicitly benefits residents who do not own vehicles. As walkability increases, often along treed streets, the need for surface parking is reduced. As impervious areas shrink (and green infrastructure is restored), so too do the effects of stormwater runoff and urban heat islands.
- Composting reduces landfill methane emissions. At the same time, it creates significantly more jobs than traditional solid waste management practices. Using compost in local gardens and orchards can support more food production and improve food access, security and nutrition. The application of compost to land restoration efforts increases carbon sequestration in the soil. It also turns the soil into a sponge, reducing flood risks and protecting water quality.
- Using nature-based solutions provides a long list of potential cobenefits. Trees shade our homes, conserving up to 25% of the energy needed for heating and cooling. They make our streets more comfortable and walkable, reducing car traffic. Trees absorb ground-level ozone and help infiltrate water into the ground. Moreover, trees increase property values, provide wildlife habitat and improve overall quality of life.

This plan is guided by a bias toward action. As a community, we already work on many of the solutions proposed here. Collaboration among experts from public health and entrepreneurship to urban design and ecology will enable more system-level connections to guide strategic investment. Ultimately, our community will become healthier and more resilient as we learn more about how to make system-level change.



## Action Sections



The action plan is divided into nine sections:

- Governance and leadership
- Community resilience
- Energy generation
- Energy efficiency
- Transportation and land use
- Urban greening
- Food and agriculture
- Solid waste
- Finance and innovation

For each section, a narrative provides an overview of the topic. For relevant sections, a summary of greenhouse gas reductions impact is provided.

### GOALS

- 1 Additionally, each section outlines several overarching goals, followed by a set of strategies and specific actions.

“Quotes in each section come from individuals who participated in community engagement on the MindMixer platform.”

# Goals: For each goal, there are a set of cobenefits and plan linkages identified

## COBENEFITS

Cobenefits are the added benefits that arise when combating climate change in addition to reductions in greenhouse gas emissions. While there are many more cobenefits that can result from climate action, the **nine** cobenefits listed below were identified as the most important and relevant by stakeholders during the plan development process. Each goal in the Climate Action Plan achieves multiple cobenefits. By drawing connections between goals and cobenefits, this plan elevates focus on opportunities to fully maximize the impact of our investments in climate action.

health & well-being	environmental quality	accessibility	affordability	cost savings
green job development	energy security	economic growth	resilience	

## LINKAGES

The linkages indicate other sections of the action plan that are relevant in some way to the goal. Along with cobenefits, these linkages are meant to be considered both in planning and implementation so that mutual benefits can be gained through new partnerships and collaborations, information sharing, cost-sharing of initiatives, etc.



### Strategies under each goal provide the following:

Mitigation ■ OR Adaptation ■

Each strategy serves mitigation, adaption or both climate resilience goals. Mitigation is the reduction of greenhouses gases, whereas adaptation focuses on anticipating the adverse effects of climate change and taking appropriate action to prevent or minimize the damage they can cause.

Potential to reduce GHG	Status/Time frame	Scale
Low, Moderate, High or Indirect	Underway/1/3/5/10/10+	Neighborhood, local government, regional, state

This indicator gives the relative potential for GHG reductions for each strategy.

For some strategies, the reduction potential is indirect, meaning that the strategy itself does not reduce GHG, but it supports other strategies that do reduce GHG.

#### Partners

A list of potential partners that would likely be involved in implementing this strategy. The list provides a starting point and is not meant to be exhaustive.

#### Equity considerations/opportunities

This section highlights potential issues, guidance and/or opportunities to consider to bring equity to the implementation of the strategy.

#### Examples

- Where possible for each strategy, examples are provided that show success in implementing this strategy in other regions or cities, nationally or internationally.

#### Action

Several actions are listed under each strategy.

These actions are considered near-term actions or next steps.

# Implementation and Monitoring

MARC and Climate Action KC will jointly form a Regional Climate Action and Policy Forum in early 2021. This group will develop detailed one- and three-year work plans. A preliminary work plan based on a review of plan priorities and opportunities is described below.

## One-year work plan for 2021

Plan adoption and rollout:

- Establish a regional climate and action policy committee.
- Deepen equity-focused community engagement.
- Refine plan performance metrics and targets.
- Launch leadership development and capacity-building initiatives.
- Create a regional education, outreach and communications plan.
- Seek funding to support from public, philanthropic and corporate partners.
- Seek endorsement from (and preliminary plan implementation by) local communities.
- Host regional climate summit.

Launch or expand existing implementation efforts:

- Buildings and energy: Launch Regional Building Energy Exchange; form a collaborative regional energy working group to focus on renewable energy and energy efficiency.
- Green infrastructure: Promote adoption of model tree protections/native landscaping ordinances; launch update to stormwater engineering standards/planning guidelines; strengthen efforts related to Blue River restoration, urban forestry, native landscaping and watershed planning.
- Transportation: Continue to advance regional/local efforts related to bikes, trails, walkability, public transportation, sustainable places and alternative fuels.
- Innovation: Host at least one innovation and design challenge per year.
- Food/waste: Expand markets for compost applications; scale (or increase) local food from urban agricultural production and recovery of excess food; form urban-rural partnerships to incentivize carbon sequestration.
- Public health: Explore opportunities for collaborative partnerships to accelerate community resilience projects within the public health sector.

## Three-year work plan for 2021-2023

The three-year work plan will be refined during the course of year one. Activities described below will build upon the one-year work plan.

Planning:

- Coordinate plan implementation through the Regional Climate Action and Policy Forum.
- Deepen equity engagement, capacity building, networking and action in vulnerable communities.
- Manage working groups to facilitate action and community engagement in each sector.
- Secure at least \$10 million in funding from strategic new funding strategies.
- Develop regional public and private sector recognition program to celebrate progress; host leadership, capacity-building and technical trainings.

Actions:

- Develop and adopt new suite of local government energy policies.
- Implement building improvements for at least 300 residences in vulnerable communities and 75 schools/community centers/libraries/universities.
- Formulate accelerated strategy to retrofit 100% of homes in the lowest quintile of socioeconomic vulnerability.
- Identify top 10 mobility hubs for planning, design and construction.
- Plant and maintain at least 50,000 trees; create regional Conservation Corps.
- Expand implementation of sustainable food production, forestry and green infrastructure initiatives.
- Host at least one innovation design challenge per year, with a focus on new job and business creation for vulnerable communities.
- Implement regional outreach, communications and education plans as part of efforts to create the resilience web.

## Proposed targets by Sector

### Goal: complete by September 2021

A series of targets will enable the Kansas City region to mark and measure progress toward plan goals. By 2050, the Kansas City region will have a net zero carbon economy. Renewable energy and energy efficiency will provide the largest initial greenhouse gas (GHG) reductions, leading to net zero energy in homes and buildings. In the transportation sector, reductions will be slower to manifest and are anticipated to approach 80%.

After other emissions reductions are achieved, carbon sequestration through landscape stewardship and restoration will enable the region to achieve net zero status. While the emissions inventory for this plan does not account for significant GHG reductions resulting from waste and food systems, advances in those sectors will make meaningful contributions.

The following targets are illustrative in nature, and will be set through a process that is inclusive of key stakeholders and responsive to community needs in each area. The goal is to complete this process of setting targets by end of 2021.

### Renewable Energy

- Electricity used by area municipalities will be powered through 100% renewable energy by 2035.
- Area electric utilities will be net-zero carbon by 2035.
- Establish five community solar programs by 2030.

### Local Water

- Install water conservation/efficiency devices in 100% of vulnerable households by 2025, in 50% of all households by 2035 and 100% of households by 2050.

### Clean and Healthy Buildings

- All new buildings will be net zero carbon by 2030 and 100% of buildings will be net zero carbon by 2040

### Housing & Development

- Proportion of area residents living within ½ mile of a park, greenway, open space or natural area is at least 50% by 2030, 75% by 2040 and 95% by 2050 (MetroGreen).

### Mobility and Public Transit

- Establish graduated VMT reduction and mode shift (the percentage of all trips made by walking, biking, micro-mobility/ matched rides or transit) goals by December 2021 for the years 2025, 2030, 2040 and 2050.
- Build out all planned Destination, Junction, and Gateway mobility hubs by 2050.

### Zero-Emission Vehicles

- Increase the percentage of zero-emission vehicles in the region to 5% by 2025, 50% by 2035 and 75% by 2050.
- Electrify 75% of RideKC buses by 2040.

### Industrial Emissions and Air Quality Monitoring

- Achieve zero days/year of unhealthy air quality due to ground-level ozone by 2030.

### Waste and Resource Recovery

- Increase landfill diversion rate to 50% by 2030, 75% by 2035 and 100% by 2050.
- Reduce municipal solid waste generation per capita by at least 15% by 2030; reduce organic waste going to landfill by 30% by 2030.
- Increase regional compost production from 20,000 tons/year in 2020 to 50,000 tons/year in 2025, 100,000 tons/year in 2030 and 350,000 tons/year in 2050.
- Increase proportion of waste products and recyclables productively reused and/or re-purposed to at least 25% by 2035 and 50% by 2050.

### Food Systems

- Fresh, nutritious food within ½ mile of low-income residents by 2030.
- Facilitate 20 large institutions to adopt food-sourcing policies.
- Increase urban agricultural production by 50% by 2030.

### Urban Ecosystems and Resilience

- Increase tree canopy in most vulnerable areas by at least 50% by 2030; plant a tree on the southwest corner of every house by 2030; achieve 40% canopy coverage in three transit corridors and 10 mobility hubs by 2035, in six corridors and 20 mobility hubs by 2040, and in all planned mobility hubs by 2050.
- Increase connected, healthy riparian habitat by 50% by 2030; restore 75% of region's riparian habitat by 2040 and 90% by 2050.
- Plant 243,000 acres of native landscapes by 2030 (Clean Air Action Plan).
- Identify goal to reduce urban/rural temperature differential for vulnerable communities by 2023.

### Prosperity and Green Jobs

- Increase the number of green jobs by 10% by 2035 and by 25% by 2050.
- Host at least one human-centered design sprint per year between 2021 – 2026.

### Lead by Example

- Achieve net zero greenhouse gas emissions for all city/county operations by 2030; convert all city/county fleet vehicles to zero emission where technically feasible by 2035.
- Champion policies aimed towards all new municipally-owned buildings and major renovations being net zero.
- Provide resilience-focused leadership training for all public, nonprofit and corporate resilience officers by 2025.



## Policy recommendations for local government

### Energy

- Adopt solar-ready ordinances.
- Adopt energy-benchmarking ordinances.
- Adopt building performance requirements.
- Adopt IECC 2021.
- Require energy disclosure at time of sale or rent.
- Link economic incentives to building performance.

### Transportation, land use and housing

- Revise zoning codes to allow for and encourage accessory dwelling units (ADUs), parking maximums and shared parking, housing unit size, height, setbacks, etc.; implement inclusionary zoning.
- Adopt, implement and evaluate complete and green streets policies.
- Revise zoning and other policies to create transit-supportive environments around existing and planned transit.

### Urban Greening

- Adopt tree, native landscaping and strengthened stream buffer ordinances.
- Update planning/zoning regulations and engineering standards for stormwater management.
- Include green infrastructure in capital improvement and asset management plans.

### Food Systems

- Amend agricultural zoning to include smaller acreages used for agriculture/ food production.

### Solid Waste

- Develop strategies/policies to enable recycling in multi-family residential buildings.
- Develop policies to enable compost collection.
- Update purchasing policies to include specifications for materials reuse, durability, packaging, embodied energy, recycled content and locally manufactured products.



# Collaboration and Leadership



## GOALS

- 1 Create new patterns of regional collaboration that guide and connect actions and facilitate equity and transparency.
- 2 Empower communities to lead



Photo courtesy of MARC.

“The hard work of resilience is both about top-down solutions as well as bottom-up ideas and momentum.”

JEREMY K.

Implementation of the regional climate action plan requires strong levels of coordination, collaboration, partnership and engagement at all levels.

Leadership development and capacity building across communities, organizations and businesses is fundamental to achieving the level of change required to attain planning goals.

A range of public, nonprofit and private sector organizations are involved in climate action across the community, among them the Mid-America Regional Council and Climate Action KC. Each of these organizations, in turn, participate in expansive networks with leaders and organizations across the community.

Creating new organizational structures will help achieve planning goals in several ways. First, with the variety and number of interested organizations and stakeholders, there is a clear need for stronger coordination. Second, stronger coordination will catalyze stronger leadership and action, and build increased levels of accountability.

Climate action initiatives will be configured to build leadership and capacity across the community, with a strong emphasis on social equity, linking community-based organizations with policy leadership and decision-making at all levels.

### Leading by example:

1. [Climate Action KC](#)
2. MARC Air Quality Forum
3. Regional Transit Coordinating Council

# Goal 1: Create new patterns of regional collaboration that guide and connect actions and facilitate equity and transparency

## COBENEFITS

health & well-being	environmental quality	accessibility	affordability	cost savings
green job development	energy security	economic growth	resilience	

## LINKAGES



Photo courtesy of MARC.

### CL-1.1: Create a regional climate policy and action committee to guide plan implementation

Mitigation ■ | Adaptation ■

A new forum to guide implementation of the plan and foster partnerships and linkages among key actors in the Kansas City region is imperative. The forum would reflect a strong commitment to diversity, equity and inclusion to ensure that ensuing work is responsive to the needs of vulnerable communities.

Representation from key sectors (i.e. transportation, water, green infrastructure, food, public health, energy, buildings) and multiple disciplines (i.e. architecture, planning, ecology, landscape architecture, engineering, community development, business, economic and workforce

development, youth) will help drive actions among local governments in the metro and within diverse organizations, businesses and communities.

The forum would meet regularly, working under the direction of the MARC Board of Directors and the Executive Committee of Climate Action KC. It would seek to integrate climate actions within a broad cross section of regional efforts. A variety of working groups may form to address specific issues or challenges as they arise. The forum would also develop processes and project pipelines to accelerate collaborative action at multiple scales.

Potential to reduce GHG	Status/Time frame	Scale
Indirect	1-year	Regional

#### Partners

Climate Action KC, local governments, neighborhood and community leaders, and sector-based leaders.

#### Equity considerations/opportunities

Just, diverse, inclusive and equitable representation is a fundamental element of committee structure and composition.

#### Examples

- Climate Action KC working groups and committees
- LA Regional Collaborative for Climate Action and Sustainability
- Southeast Florida Regional Climate Change Compact

#### Action

Launch an inclusive process to define role, structure and composition.

Establish a Regional Climate Policy and Action Forum, with one- and three-year work plans.

Develop project and policy development processes to accelerate adoption and implementation.

### CL-1.2: Measure and track performance towards reaching goals and targets

Mitigation ■ | Adaptation ■

The plan proposes a set of preliminary quantitative goals and targets. By joining the Global Covenant of Mayors for Climate and Energy, this plan seeks to achieve GHG reductions of at least 26-28% by 2025; net zero emissions from local government operations by 2030; net zero emissions from energy generation by 2035; net zero emissions from buildings by 2040; and become a net zero regional economy by 2050.

At the same time, the plan seeks to achieve adaptation goals relative to food security, energy and water affordability, mobility, public health, safety, infrastructure durability and resilience, among other issues. More detailed performance metrics and targets related to job creation, equity benefits and other factors remain to be developed.

Potential to reduce GHG	Status/Time frame	Scale
Indirect	Underway	Regional

#### Partners

Partner stakeholders and organizations, subcommittees of the Regional Climate Policy and Action Forum, MARC committees

#### Equity considerations/opportunities

Metrics will include explicit measures with equity benefits.

#### Examples

- pLAn – Los Angeles Climate Plan
- MARC Communities for All Ages Recognition Program
- Climate Indicators: Southeast Florida Climate Compact
- Climate and Energy Progress Dashboard: Metropolitan Washington Council of Governments

#### Action

Present plan to local jurisdictions for consideration, adoption and implementation.

Develop performance metrics, a data management strategy and performance communications tools.

Develop a recognition program for local governments and other community organizations to track progress on plan implementation.

# Goal 2: Empower communities to lead

## COBENEFITS

health & well-being	environmental quality	accessibility	affordability	cost savings
green job development	energy security	economic growth	resilience	

## LINKAGES



### CL-2.1: Develop a network of climate leaders and ambassadors at all levels

Mitigation  | Adaptation

A broad range of community stakeholders participated in the development of this plan. Moving from plan development to implementation will require the identification and cultivation of leaders and champions across the community. Local governments, local businesses, neighborhoods, schools, universities, hospitals and others will need to identify points of leadership for implementation.

Climate Action KC leadership provides a strong starting point for community champions and ambassadors. Deepening this leadership among local governments and community groups, especially in frontline communities, will be pivotal to the plan’s success.

Potential to reduce GHG	Status/Time frame	Scale	Lead
Indirect	3 year	Regional	MARC

### Partners

Climate Action KC, local governments, businesses, neighborhood organizations, nonprofits, trade associations, business districts, universities

### Equity considerations/opportunities

Leadership is viewed in an inclusive manner. The initiative views leadership potential throughout the community—at multiple scales and positions, with diverse networks creating opportunities for leverage, partnership, collaboration, synergy and efficiency. Leadership development strategies can be tailored based on interest and need.

### Examples

- Association of Climate Change Officers

### Action

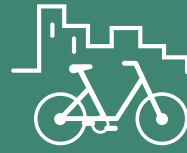
Encourage public- and private-sector organizations to hire, designate or share resilience officers. The Building Energy Exchange concierge service may be of particular assistance to smaller communities.

Provide training and certification to support leadership development and organizational capacity.



Volunteer at recycling event  
Photo courtesy of Bridging The Gap.

# Transportation



## GOALS

- 1** Reduce vehicle miles traveled (VMT) per capita
- 2** Shift the regional fleet to low- and no-emission vehicles
- 3** Shift trips to affordable, equitable and safe mobility options
- 4** Improve the transportation system so it is resilient to the shocks and stresses of climate change

“Resiliency for me means an emphasis on multimodal transportation. This isn't necessarily anti-car, so much as it is pro-environment ... The communities that are thriving right now and that will emerge faster and stronger than others are the ones that have found ways to quickly and meaningfully support transportation options for the most vulnerable, who must walk and bike to get to key destinations.”

MICHAEL K.

The way we move and how we develop our communities plays a critical role in the amount of greenhouse gases (GHGs) we emit.

Reducing the amount we travel and using fuel sources that produce fewer GHG emissions are ways to reduce emissions from sources in the transportation sector.

To reduce the amount mileage we drive collectively, we can drive alone less and expand the use of other transportation modes, like biking, public transit and carpool. Remote working could play a major role in reducing single-occupancy vehicle trips, especially in the Kansas City region where so many people commute alone in their own cars. Now that the COVID-19 pandemic has forced many people to work from home, more and more companies are expanding their telework policies.

Another way to reduce the amount we drive, especially alone in our own cars, is to make it possible for the average household to fulfill everyday needs closer to home. We do this by focusing investment in centers and corridors, allowing more people in our region to live, work and play without driving long distances.

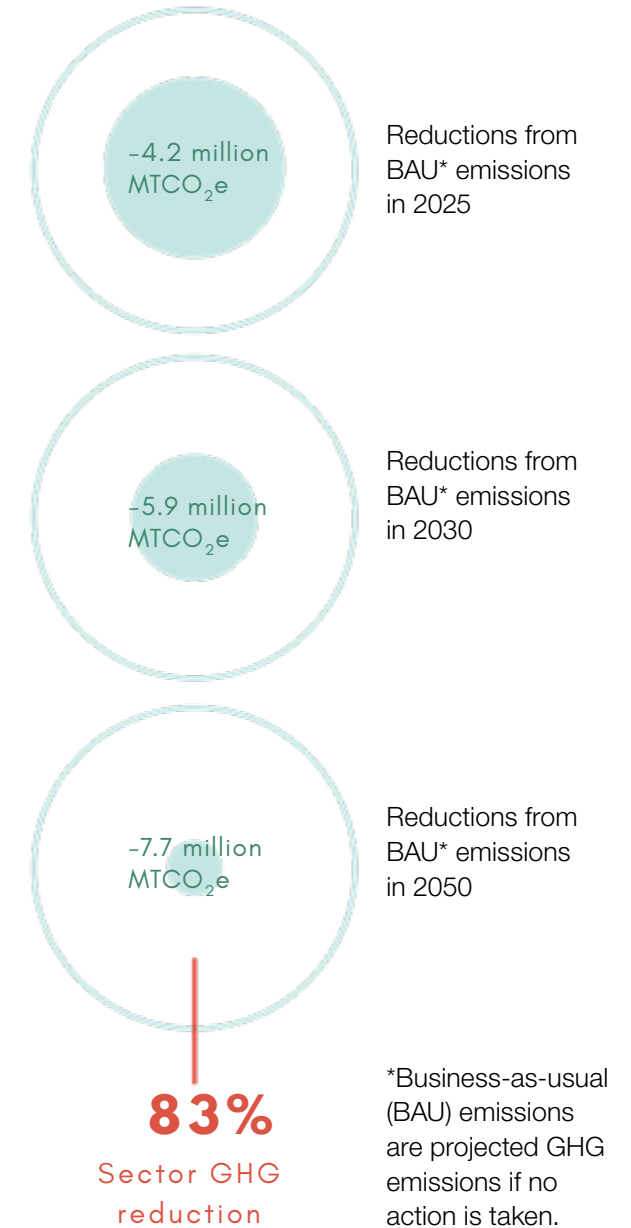
Centers and Corridors: The Kansas City region, like all metropolitan areas, contains major roadways that attract development. In our region, six main corridors were identified through the Creating Sustainable Places initiative. Directing resources to redevelop and incentivizing a mix of uses—commercial and residential—around these corridors and other activity centers is key to making our region more vibrant, connected and green.

Use greener fuel: The other primary way we can reduce GHG emissions is to shift from petroleum fuel to existing low-emission alternative fuels or no-emission vehicles. Electrification of our vehicle fleet will greatly reduce GHG emissions. If 75% of the vehicles on our roadways are electric, emissions will go down by 35% from 2015 levels. If other strategies are added, such as compact land use around centers and corridors, our models indicate that emissions can be reduced 61% from 2015 levels, putting the Kansas City region in the relative range of reductions needed to mitigate major climate change impacts.

## Leading by example:

1. Main street corridor (streetcar), KCI bus electrification
2. Gilham Road cycle track
3. Downtown Overland Park redevelopment
4. City of Olathe CNG trash truck fleet
5. City of Shawnee green street classification
6. City of Olathe compressed natural gas sanitation trucks

## GHG Reduction:



## Top reduction strategies:

1. Fuel switching (electrification)
2. Shifting trips to bus, bike, walking or shared mobility
3. Fuel efficiency
4. Low carbon/sustainable urban development



# Goal 1: Reduce vehicle miles traveled (VMT) per capita

## COBENEFITS

health & well-being	environmental quality	accessibility	affordability	cost savings
green job development	energy security	economic growth	resilience	

## LINKAGES



### T-LU 1.1: Increase and target sustainable, mixed-use and mixed-income development at key activity centers and corridors where infrastructure is already in place.

Mitigation  | Adaptation

By increasing the number of housing units and types as well as encouraging a mix of uses around existing activity centers and corridors, residents and workers will naturally reduce the mileage they drive. This is not only because distances to get to jobs, grocery stores and other amenities will be reduced, but because sustainable development lends itself to other

forms of transportation, like walking, biking, transit and scooters. By developing these types of high-intensity centers and corridors where infrastructure already exists, we will realize several cobenefits such as reduced land consumption and improved opportunities for communities to gather and interact in common spaces.

Potential to reduce GHG	Status/Time frame	Scale
High	Underway	Neighborhood, Local Government, Regional

#### Partners

Local governments, BikeWalkKC, transit agencies, RideKC Development Corporation, existing businesses, neighborhoods

#### Equity considerations/opportunities

When implementing this strategy, priority should be given to existing environmental justice (EJ) areas that include activity centers and corridors. Equity opportunities and benefits include jobs access, economic development/workforce development and housing affordability.

#### Examples

- Downtown Overland Park redevelopment
- Redevelopment at key nodes along Prospect Max (31st St., etc.)

#### Action

Prioritize funding for projects in activity centers and along corridors, and ensure funding is fairly and justly distributed.

Work with economic development organizations and local governments to incentivize and create favorable conditions for housing and job opportunities and a mix of other uses (including green infrastructure) around centers and corridors.

Examine housing unit size, height and setback requirements and allow for and encourage accessory dwelling units (ADUs).

Encourage implementation of inclusionary zoning, especially in activity centers, to facilitate the creation of affordable housing.

### T-LU 1.2: Establish 15-minute neighborhoods

Mitigation  | Adaptation

The 15-minute neighborhood concept imagines neighborhoods where residents can reach most of their daily needs within a 15-minute walk of their homes. This includes access to goods and services like grocery stores, schools and healthcare. Many residents of 15-minute neighborhoods would also be able to reach their jobs within this 15-minute walkshed, thanks to incentives for small- to medium-sized employers. For a 15-minute neighborhood to be truly sustainable, it would need to contain housing

opportunities for a range of income levels, thus allowing a variety of workers to live, work and play within its boundaries. To work towards implementing 15-minute neighborhoods, it is crucial that planners work closely with neighborhood leaders and residents to fine-tune the concept to the particular community.

Potential to reduce GHG	Status/Time frame	Scale
High	1-3-year	Neighborhood, Local Government

#### Partners

Local governments, economic development organizations, BikeWalkKC, transit agencies, RideKC Development Corporation, neighborhoods, existing businesses

#### Equity considerations/opportunities

While 15-minute neighborhoods have the potential to increase opportunities for lower-income households, especially those that do not own a car, gentrification leading to the displacement of existing residents is a possible side effect of this strategy. Therefore, local governments should work to increase incentives for affordable housing and work to diversify employment in partnership with local neighborhood associations.

#### Examples

- Paris
- Houston
- Ottawa

#### Action

Provide educational opportunities to learn more about 15-minute neighborhood initiatives around the country.

Integrate 15-minute neighborhood elements into the evaluation criteria for the Planning Sustainable Places program.

Examine 15-minute neighborhood components when creating long-range plans for areas and cities.



Armour Road Complete Streets  
Photo courtesy of MARC.

**T-LU 1.3: Increase complete and green streets throughout the region**

Mitigation  | Adaptation

Complete and green streets provide comfortable places for people to walk, roll, bike and drive while managing stormwater with vegetation and permeable surfaces.

While all streets cannot accommodate all users, most can be retrofitted to allow for the comfortable and safe travel of all users.

In the Kansas City region and across the country, many streets can undergo a “road diet,” replacing pavement previously only designated for motor vehicles with transit facilities, bike lanes, sidewalks, multi-use paths or other public space.

Furthermore, green elements can provide additional benefits such as beautification, place making, providing shade and urban heat reduction, and decreased flooding through better water retention.

By increasing complete and green streets throughout the region, local governments will facilitate a mode shift from driving to walking and biking, thereby reducing VMT, while mitigating the effects of climate change.

Potential to reduce GHG	Status/Time frame	Scale
Medium	Underway	Neighborhoods, Local Government

**Partners**

BikeWalkKC, transit agencies, local governments, neighborhood associations

**Equity considerations/opportunities**

Complete streets by their nature provide a more equitable transportation system because they are designed more for people than single-occupant vehicles. Still, changes to streets are not always viewed by the neighborhood in a positive light. All communities should be engaged in changes to the built environment that affect them, and planners should make a concerted effort to engage nearby neighborhoods as early as possible during the planning process to gather input.

**Examples**

- Armour Road, North Kansas City
- Gillham Road, Kansas City, Missouri
- River Market
- Lenexa City Center

**Action**

When resurfacing streets, local governments are encouraged to examine local and regional plans, restriping with bike lanes and adding trees or other green infrastructure measures.

Encourage adoption and evaluation of complete and green streets policies.

Encourage development of local plans for complete streets implementation, including extensive community engagement.

**Goal 2: Shift the regional fleet to low- and no-emission vehicles**

**COBENEFITS**



**LINKAGES**



**T-LU 2.1: Expand electric vehicle charging infrastructure throughout the region**

Mitigation  | Adaptation

While we know that more concentrated, mixed land use is critical to reducing vehicle-related emissions, electric vehicle technology has the potential to greatly reduce emissions produced by the transportation sector. Modelling work MARC has done indicates that electrification of 75% of our fleet would reduce greenhouse gas emissions by 35% (from 2015 levels).

In order to support the efficient electrification of our vehicle fleet, charging infrastructure needs to be deployed effectively throughout the region. The large portion of the

Kansas City region covered by Evergy has an extensive network of electric vehicle chargers, while some areas not covered by Evergy either have sparse coverage or no electric vehicle charging infrastructure at all.

For the most part, there is less charging infrastructure in lower-income areas. Expanding access will enable vulnerable communities to enjoy the benefits, like cleaner air.

Potential to reduce GHG	Status/Time frame	Scale
Medium	Underway	Neighborhood, Local Government, Regional

**Partners**

Electric utilities (Evergy), local engineering firms, state and local governments, Metropolitan Energy Center, U.S. Department of Energy, National Renewable Energy Laboratory, charging station providers

**Equity considerations/opportunities**

Incentives for used EVs or EV carsharing to expand EV charging would benefit low-income communities. Expanding charging infrastructure to underserved communities should be prioritized after extensive neighborhood education, outreach and input.

**Examples**

- [Evergy Clean Charge network](#)

**Action**

Identify and prioritize EV charging station opportunities and potential funding sources.

Support direct incentives for electric vehicles on the local, state and federal level.



## T-LU 2.2: Implement EV car-sharing in low-income communities

Mitigation  | Adaptation

Many individuals and households in low-income communities do not have access to their own vehicle. Transit ridership and rates of walking and biking are often higher in these communities as a result.

Still, having access to a vehicle is important and often necessary, especially in a car-dependent environment. While car-sharing programs in general provide a mobility option to those who do not own their own vehicle, EV car-sharing has the added benefit of zero tailpipe emissions.

Given that low-income communities often have higher rates of asthma and other respiratory conditions, EV car-sharing in these communities could achieve multiple benefits.

EV car-sharing in neighborhoods with existing transit has also been shown to delay or reduce the need to purchase a vehicle—a cost savings benefit to lower-income communities.

Potential to reduce GHG	Status/Time frame	Scale	Lead
Low	5-year	Neighborhood, Local Government, Regional	Local

### Partners

Car-sharing companies, community-based organizations, neighborhoods, local governments

### Equity considerations/opportunities

This is an equity-focused strategy. It is meant to supplement the provision of effective transit and mobility options in lower-income communities and communities of color.

### Examples

- [LA's BlueLA carshare program](#)

### Action

**Research EV car-sharing programs and business models that operate in low-income communities.**

**Conduct a feasibility study of developing this type of program including potential car-share locations.**



## T-LU 2.3: Electrify municipal, transit agency and other public fleets

Mitigation  | Adaptation

Local governments and public agencies have a significant opportunity to lead the transition away from gas-powered vehicles.

As fleet vehicles are replaced, local governments can make use of federal funds and cooperative procurements to decrease overall costs or minimize additional costs. Local governments and public agencies should also consider the source of the electricity from an overall

emissions standpoint. Pairing fleet transitions with opting into renewable energy sources will help further reduce emissions.

Furthermore, electrifying public fleets, such as transit vehicles, will also help reduce ground-level emissions in communities that already experience higher rates of asthma and other respiratory conditions.

Potential to reduce GHG	Status/Time frame	Scale
Medium	Underway	Local Government, Regional

### Partners

Transit agencies, local governments, MEC, EV providers, EPA, DOE, NREL, environmental advocacy groups, electric utilities (Evergy)

### Equity considerations/opportunities

Electric vehicles not only eliminate GHG tailpipe emissions but also reduce pollutants that affect respiratory health conditions like asthma. As a result, transit agencies and local governments should work to replace fleet vehicles that operate or are used in vulnerable communities.

### Examples

- Kansas City, MO
- Minneapolis, MN
- City of Atlanta
- City of Los Angeles
- MTA (New York) electric bus conversion

### Action

**Educate public agencies about existing funding opportunities for alternative fuel vehicle purchasing; encourage submissions of applications for this funding.**

**Provide information to local governments about purchasing electric vehicles through the Kansas City Regional Purchasing Cooperative (KCRPC).**

# Goal 3: Shift trips to affordable, equitable and safe mobility options

## COBENEFITS

health & well-being	environmental quality	accessibility	affordability	cost savings
green job development	energy security	economic growth	resilience	

## LINKAGES



Photo courtesy of RideKC.

### T-LU 3.1: Create more protected and connected bike lanes, greenways, sidewalks and electric bike and scooter share systems

Mitigation ■ | Adaptation ■

Research shows that when safe pedestrian and bicycle infrastructure is built, more people feel comfortable walking and biking to get to where they need to go.

Paired with the distribution of shared bikes and scooters, a connected and well-maintained system provides mobility choices that have zero tailpipe emissions and provide residents with a way to integrate physical activity into their daily lives.

Expanding these modes of transportation complements expanded public transit by providing options for first- and last-mile travel to complete a full trip. This is essential for improved connectivity within a multi-modal system and job accessibility.

Potential to reduce GHG	Status/Time frame	Scale	Lead
Medium	Underway	Local Government, Regional	Local/MARC

#### Partners

Local governments, mobility service providers, BikeWalkKC, RideKC, scooter providers

#### Equity considerations/opportunities

Priority should be given to improving pedestrian and bicycle infrastructure as well as expanding shared bike and scooter fleets in underserved communities, which are more impacted by both mobility and air quality issues.

#### Examples

- BikeWalkKC's Bikeshare for All initiative

#### Action

Consider implementation of city- and county-wide plans for trails and protected bike facilities, including bike sharing.

Work with providers to bring electric bikeshare and scooter programs to activity centers and mobility hubs, especially in underserved areas.

### T-LU 3.2: Build out the Smart Moves transit and mobility system, including the network of mobility hubs

Mitigation ■ | Adaptation ■

In 2017, the Smart Moves 3.0: Regional Transit and Mobility Plan was adopted. Smart Moves provides for increased and expanded fixed route transit service, a network of mobility hubs where different moves come together, and the expansion of supportive land use and mobility services across the Kansas City region. The Smart Moves 3.0 plan also places an emphasis on using transit and mobility services to increase the accessibility of employment opportunities.

Smart Moves contains plans to improve the regional transit system over a 20-year time horizon. These improvements include increasing the number of fast and frequent routes, and addressing the current deficit in east-west connectivity and low service levels during the evening and on weekends. These strategies will allow more people to count on transit as a reliable, safe and enjoyable transportation option.

Potential to reduce GHG	Status/Time frame	Scale	Lead
High	Underway	Local Government, Regional	Local/MARC

#### Partners

Local governments, transit agencies, mobility service providers

#### Equity considerations/opportunities

Priority should be given to improving and expanding service in low-income communities and communities of color, which are more impacted by jobs access and environmental quality issues.

#### Examples

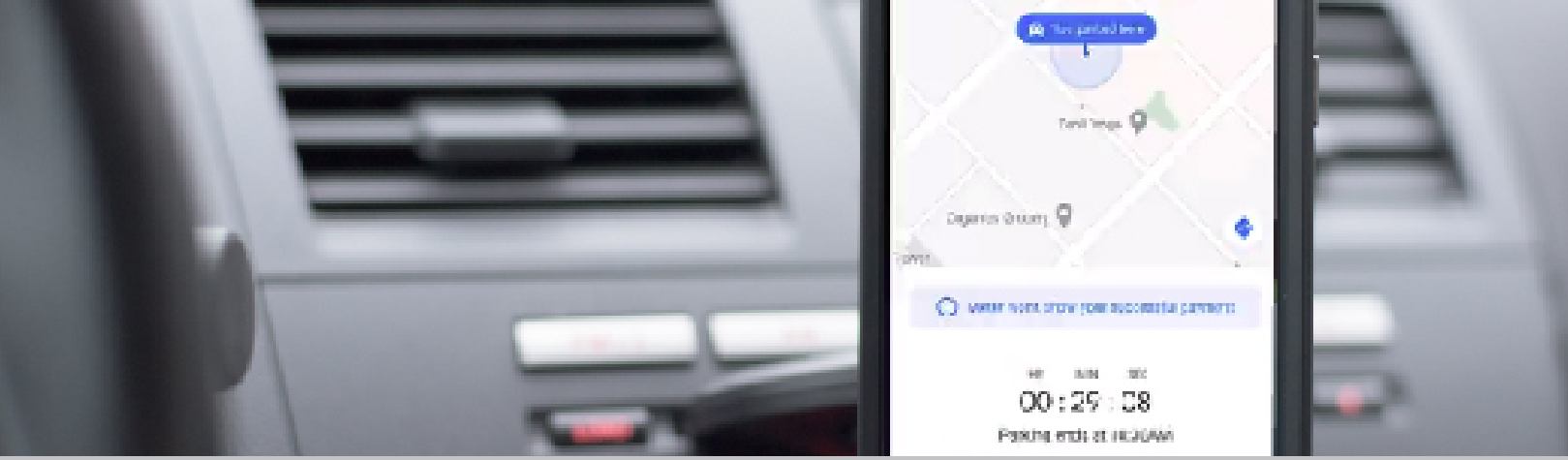
- Prospect MAX
- Main Street Streetcar expansion
- East Village Transit Center

#### Action

Encourage implementation of Smart Moves transit and mobility hub recommendations.

Evaluate transit service provision and/or mobility hub creation through Planning Sustainable Places program.

Consider zoning and other policies to create transit-supportive environments around existing and planning transit.



**T-LU 3.3: Encourage a shift to other modes of transportation through parking policy**

Mitigation  | Adaptation

Parking policies have the power to impact how much people choose to drive alone versus use other modes like transit, biking, walking, carpool/vanpool and scooter/bikeshare programs. If people do choose to drive, smart parking technologies can provide drivers with information on parking availability and reduce circulation in a district—and therefore greenhouse gas emissions.

Additionally, parking is expensive for developers to provide. Surface parking spots cost between \$5,000 and \$10,000 to construct and a spot in a parking structure generally costs over \$20,000 to build. Allowing developers near fast and frequent transit to decrease or eliminate the amount of parking they build serves as both a development incentive and facilitates the creation of more affordable housing units.

Potential to reduce GHG	Status/Time frame	Scale	Lead
High	Underway	Local Government	Local

**Partners**

Developers, local governments

**Equity considerations/opportunities**

Reducing the area for parking increases the viability of public transit, makes streets more walkable and reduces heat islands and stormwater runoff.

**Examples**

- Prospect MAX
- Main Street Streetcar expansion
- East Village Transit Center

**Action**

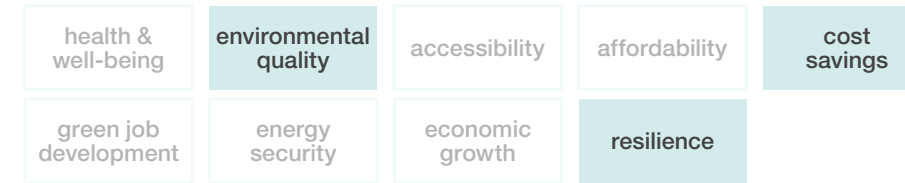
Consider elimination off-street parking requirements for multi-family and commercial development in activity centers and around transit routes and mobility hubs.

Explore elimination of parking minimums, especially around fast and frequent transit.

Encourage parking maximums and work with businesses to share their parking resources to reduce the need for parking.

**Goal 4: Increase the resilience of the transportation system to shocks and stresses of climate changes**

**COBENEFITS**



**LINKAGES**



**T-LU 4.1: Redesign and upgrade critical and vulnerable infrastructure**

Mitigation  | Adaptation

The Kansas City region, like many other areas, is already experiencing the effects of climate change. Key local threats focus on extreme heat, drought and flooding. Cities, counties and states would benefit from assessing and reducing risks and vulnerabilities when building new or retrofitting existing transportation facilities.

Local assessments would help prioritize infrastructure retrofit or construction in ways that reduce risks and vulnerabilities. Planning and design processes may consider broader transportation system dynamics to facilitate implementation of sustainability upgrades ahead of worsening impacts.

Potential to reduce GHG	Status/Time frame	Scale	Lead
Indirect	Underway	Local Government, State	Local/State

**Partners**

American Public Works Association, KDOT/MODOT, watershed managers

**Equity considerations/opportunities**

Priority should be given to retrofitting existing and adding new infrastructure that is designed to mitigate the effects of climate change in vulnerable communities. Benefits include workforce development and jobs access.

**Examples**

- Blue River Watershed Resilience Study, Kansas State University

**Action**

Gather data and map where transportation infrastructure is particularly at-risk to flooding and potentially other hazards.

Support inclusion of green infrastructure when designing or retrofitting roadways, prioritizing areas where vulnerable populations are concentrated—green infrastructure may include restoration of impacted streams and stream corridors.

Provide educational opportunities for local governments on how to redesign and upgrade transportation infrastructure for climate resiliency.