CITY OF GRAND RAPIDS

CLIMATE ACTION & ADAPTATION PLAN

AUGUST 2025

City Commission

Resolution of Approval

CITY OF GRAND RAPIDS

2025 Climate Action Adaptation Plan

94858 Result: Approved
Mover: Kilgore. Supporter: Perdue.
Yeas: Knight, Perdue, Ysasi, LaGrand, Belchak, Kilgore Nays: Robbins

WHEREAS:

1. The Intergovernmental Panel on Climate Change (IPCC) stated that to meet the 2015 Paris Agreement commitment of keeping warming below 2.7°F global emissions must be reduced; and

2. The State of Michigan's MI Healthy Climate Plan established a goal for Michigan to reach 100% carbon neutrality by 2050; and

3. On September 28, 2021, City Commission passed a resolution declaring climate change a crisis, committing to create a Climate Action and Adaptation Plan and the inclusion of community-wide science-based targets; and

4. The City's Strategic Plan calls to reduce carbon emissions, support climate adaptation and increase climate resiliency by creating and implementing a Climate Action and Adaptation Plan (CAAP) in partnership with the community that works in parallel and complements the new Community Master Plan; and

5. Grand Rapids aspires to be a resilient, low-carbon city that centers equity in climate solutions to ensure a safe and healthy community; and

6. The City will act as a leader for the Climate Action and Adaptation Plan by modeling emissions reductions in municipal facilities and fleet, implementing actions under local control, advocating for legislative and regulatory changes, and acting as a convener for community stakeholders to move innovative solutions and make collective progress towards the communitywide science-based targets; and

7. Collaboration between the City and community partners helped to create and conduct robust community engagement and outreach over the course of three years; and

8. The City Commission held a public hearing on April 29, 2025 to seek public comments and additional briefings on May 13, 2025 and July 15, 2025 that resulted in 20 prioritized actions of the plan; therefore

RESOLVED:

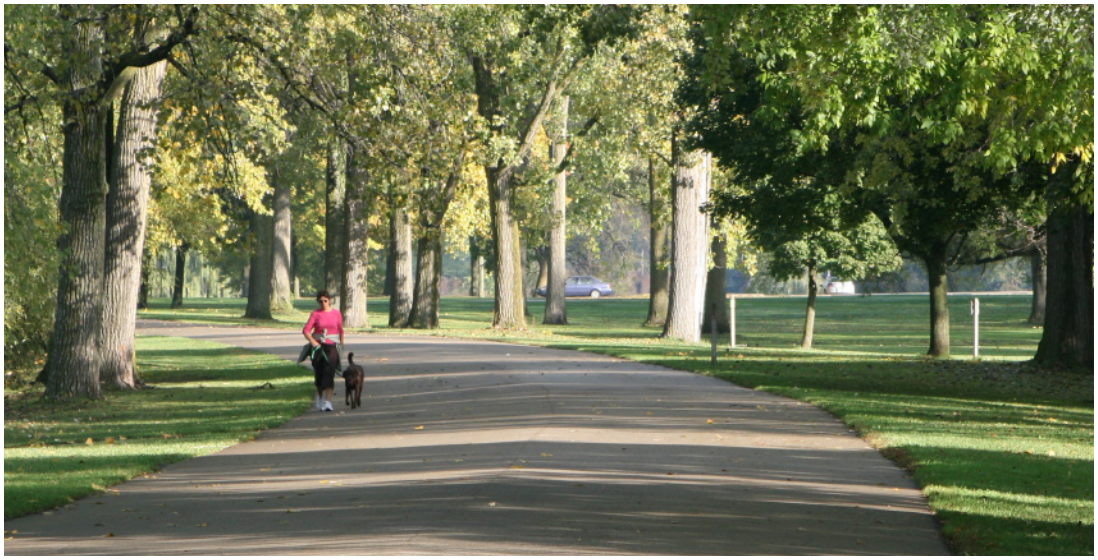
1. That the City Commission hereby accepts the Grand Rapids Community Climate Action and Adaptation Plan (Attachment A) as a guide for how the Grand Rapids community will reduce greenhouse gas emissions and prepare for the impacts of climate change on people, the environment and infrastructure; and

2. That the City Commission prioritizes the twenty (20) actions (Attachment B); and

3. That the implementation of the Climate Action and Adaptation Plan and prioritized actions shall be consistent with other goals of the City Commission, including economic prosperity and affordability, and more specifically, housing affordability, and is not intended to widen the gap of attainable and affordable housing by creating unsustainable housing and development cost increases.

I hereby certify that the foregoing is a true transcript of the action of the City Commission of the City of Grand Rapids, Michigan, in public session held August 12, 2025.

Joel H. Hondorp, City Clerk



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A Letter from the City Manager

As City Manager of Grand Rapids, I am proud of our city's recent efforts to embrace, enjoy, and protect our natural resources, such as water, trees, and parks. We have also been mindful of redeveloping our city in a way that has led to a vibrant urban community. However, we still face challenges from extreme weather events and how to sustainably manage resources (waste, water, energy, etc.) that affect residential services and fees. As we continue this journey and build upon our 175-year history, I reference this plan in light of several questions: "How do we improve or sustain our environmental future responsibly?" How can the built environment and natural environment coexist? How can we have a healthy environment and healthy economy simultaneously? How can we protect the planet while ensuring responsible and affordable housing and development? How can we focus on growth and land use in the community master plan while mitigating the unintended environmental impacts of growth?

As we engage our community, I remain committed to making progress in the health, safety, economic prosperity, mobility, and environmental sustainability of our city. We were recently acknowledged by LinkedIn as the number one city on the rise. To continue being a city on the rise, we must address climate resilience in a responsible way. This plan challenges us to elevate our commitment to addressing climate change. This commitment is reflected in our city's six core values and our Strategic Plan. We define sustainability as making decisions with the goal of achieving long-term net positive benefits, informed by understanding how those decisions impact climate resiliency, the environment, people, communities, and finances, both today and in the future.

To embody that value, the city has embraced efforts like the 2007 Green Grand Rapids Plan, Bike Plan, Parks Master Plan, Water Master Plan, Stormwater Master Plan, GR Forward Plan, Economic Development and Mobility Plan, and the most recent Bridge to our Future Community Master Plan. Moreover, in the fall of 2021, the city adopted our first municipal greenhouse gas emissions reduction goal – an 85% reduction by 2030 compared to our 2008 baseline and carbon neutrality by 2040. Thanks to the tremendous effort of many departments, we reduced emissions by 30% as of 2020, with the expectation of achieving a 47% reduction in 2025 from converting 18,000 streetlights to LEDs, powering the biodigester, and installing the solar array at our Lake Michigan Filtration Plant.

While it is critical that we lead by example and demonstrate that significant emissions reductions are achievable, we know that the city's municipal emissions account for just over 2% of our community's total emissions. It is paramount that we work in partnership with our residents and employers to identify effective ways to achieve our community-wide science-based emissions reduction targets of 62.8% per capita by 2030 and carbon neutrality by 2050.

I appreciate the collective effort that brought many community members together to propose the Climate Action & Adaptation Plan to the City Commission. This plan creates a roadmap for what we could accomplish by 2030 and 2050 to expand on our successes in sustainability. The efforts have garnered both support by some and concerns by others regarding their intent and unintended impact. The execution of the plan is now more challenging due to significant funding reductions around climate and clean energy spending at the federal level.

However, we will continue to advocate for funding at the federal and state levels, so our local community and residents do not have to shoulder the cost of this national and global problem without assistance. The plan aims to address the harmful impact of climate change, but we are also mindful of avoiding unintended outcomes that make housing and development more unaffordable and unattainable. To find balance, the City Commission has chosen to prioritize the top 20 initial actions of the plan to be strategic in focus, time, and resources given the current state of our nation.

Meeting this challenge will depend on the commitment of everyone in our community, state, and country. Each of us has a critical role to play. While the goals, strategies, and actions within the plan may require financial investment, many can provide rapid returns on investment (e.g., energy efficiency projects), and others have resilience benefits (e.g., on-site solar generation) that could drastically reduce and possibly eliminate future costs resulting from climate impacts. We must carefully evaluate investments, outcomes and impact while utilizing this plan as a guide for community members.

I would like to thank everyone who contributed to the Climate Action & Adaptation Plan: our Office of Sustainability for their leadership, the many city departments, and community members who shared their time, expertise, and experiences that led to this plan. I would also like to thank our City Commission, who used this community plan as a guide for their prioritization deliberations and sharpened our focus on actionable efforts. I look forward to the work we will accomplish together to ensure the health of all our people, places and the environment are advocated for, protected, and enhanced.

In partnership,

Mark A. Washington
City Manager

CITY OF GRAND RAPIDS

Letter from Community Partners

To the Readers of this Plan,

Addressing the climate crisis is not just an environmental imperative, but also a crucial economic and social one. Climate change is one of the most pressing global challenges of our time, posing significant threats to human well-being, social equity, and environmental sustainability. The impacts of climate change disproportionately affect marginalized communities and developing nations, exacerbating existing inequalities and injustices. To address these issues effectively here in Grand Rapids, there is a critical need for climate justice advocacy, policy reform efforts, and community initiatives aimed at reducing greenhouse gas emissions; like the City of Grand Rapids' first Climate Action & Adaptation Plan (CAAP).

Community Collaboration on Climate Change (C4) has been heavily involved in each round of the CAAP process since its inception. The C4 kicked off the first round of the CAAP engagement process with a Call to Climate Justice event and engaged community on the first round of the CAAP Survey. C4 canvassed, marketed, tabled and attended community events to gather CAAP resident input surveys. C4 continued to partner with the City of Grand Rapids in the second round of CAAP community engagements; where C4 collaborated to host community events, focused on the six CAAP key sectors of focus: Energy Systems, Residential Homes, Buildings & Industry, Transportation, Nature Based Solutions, and Food Systems. In further involvement in the CAAP process, C4 hosted and facilitated six Climate Risk and Vulnerability Assessment focus groups to engage with Spanish only speaking residents, the unhoused, the BIPOC community, and youth, at trusted venues familiar to the residents, in their neighborhoods. Lastly, C4 partnered with the City on the round 3 engagement event to engage with community on the draft of the CAAP. In many of these community initiatives and engagement, C4 worked to remove barriers to participation from marginalized communities, providing childcare, dinner, and stipends for participating.

With intentional engagement, the Grand Rapids' CAAP outlines a comprehensive and effective strategy to reduce greenhouse gas emissions, transition to renewable energy sources, and prepare for the impacts of climate change. The Community Collaboration on Climate Change (C4) will continue to work with the City of Grand Rapids and our climate justice partners to dismantle extractive systems and build new systems to combat climate change that are centered in human well-being and shared leadership. This Plan is vital for mitigating the impacts of climate change and introduces a significant opportunity for economic growth and job creation in the renewable energy sector.

On behalf of the Community Collaboration on Climate Change, I urge you to read the CAAP and support its implementation.

Sincerely,
Arturo Puckerin, Esq
Executive Director
Community Collaboration on Climate Change (C4)

Acknowledgements

The City would like to thank the following individuals for their commitment and dedication in assisting with the Climate Action & Adaptation Plan (CAAP) process. Sharing your knowledge, lived experiences, and ideas provided a vital service to your community. Additionally, the City would like to thank all community members who took the time to participate in the CAAP process and invest in the climate resilience of the city.

(*former)

SPECIAL THANKS
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The Wege Foundation

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Executive Summary

Urban areas help promote less carbon-intensive lifestyles with increased densities, connectivity and accessibility, yet climate change remains one of the most complex challenges of our time. The Climate Action and Adaptation Plan (CAAP) is a road map for how the Grand Rapids community will reduce greenhouse gas emissions (GHG) and prepare for the impacts of climate change on people, the environment and infrastructure. The CAAP brings together targeted universalism community engagement with local community-based organizations and technical resources, such as a greenhouse gas emissions inventory and climate risk and vulnerability assessment, to identify the key sectors needed to address climate change.

The six key sectors identified as priorities in the CAAP to address community-wide emissions and prepare for the impacts of climate change were:

- **Energy Systems:** Addressing the generation, distribution and consumption of fossil fuel-based energy.
- **Residential Homes:** Increasing the affordability, energy efficiency, health, climate resilience and access to renewable energy of housing
- **Buildings & Industry:** Reducing GHG emissions from buildings & industrial processes
- **Transportation:** Reducing reliance on fossil fuel powered single-occupancy vehicle usage, increasing active and shared modes of transportation, and increasing access to electric vehicles.
- **Nature Based Solutions:** Increasing sequestration and increasing nature's resilience to climate change.
- **Food Systems:** Reducing waste and increasing access to local food and growing opportunities

Collectively, the plan offers 16 goals to be met by 2030 that will help get us on the pathway to carbon neutrality by 2050. The plan includes 32 over-arching strategies and 197 actions to be implemented to meet the City's established community-wide science-based targets. The CAAP is considered an educational resource as well as an action-based guide for climate work.

Implementation will be the crucial to the success of this plan. The City of Grand Rapids is committed to addressing the climate crisis by working towards the goals, strategies and actions outlined within this plan to achieve the established community-wide science-based targets. Key actions for the City's will include modeling emissions reductions in municipal facilities and fleet, implementing actions under local control (e.g., land use), and advocating for legislative and regulatory changes necessary to meet the CAAP's goals. The City will also provide leadership in establishing effective partnerships with nonprofit leaders, private businesses and residents to move innovative solutions and community progress. However, achieving Grand Rapids community-wide science-based targets will only be made possible with community buy-in and proceeding action. Within the CAAP there are numerous opportunities for external partners and organizations to provide leadership. Working together we'll move further toward the CAAP's vision that Grand Rapids will be a resilient, low-carbon city that centers equity in climate solutions to ensure a safe and healthy community.

Climate Science and Impacts in Grand Rapids

Greenhouse Gas Emissions Inventory Summary

The residents and employers located in the city of Grand Rapids generated 2.5 million metric tons of carbon dioxide equivalents ($MTCO_2e$) in 2019. 2.5 million $MTCO_2e$ is considered the greenhouse gas (GHG) footprint of the city of Grand Rapids. Often the term "carbon" is used interchangeably with "greenhouse gas" as carbon dioxide is the primary greenhouse gas emitted by human activities.

The three largest sources of GHG emissions are: **buildings** (40% total with single and multi-family residential accounting for 28% and commercial buildings accounting for 11%), the **transportation** sector (30% total with gasoline-powered vehicles accounting for 18%), and **industrial processes** (25%). Solid Waste, Upstream Impacts, Water & Wastewater, Process & Fugitive Emissions, and Agriculture are responsible for the remaining (approximately 6%) emissions.

2019 Grand Rapids Community-wide Emmissions Summary

A total of 2,472,415 $MTCO_2e$ was generated in 2019 from all sources.

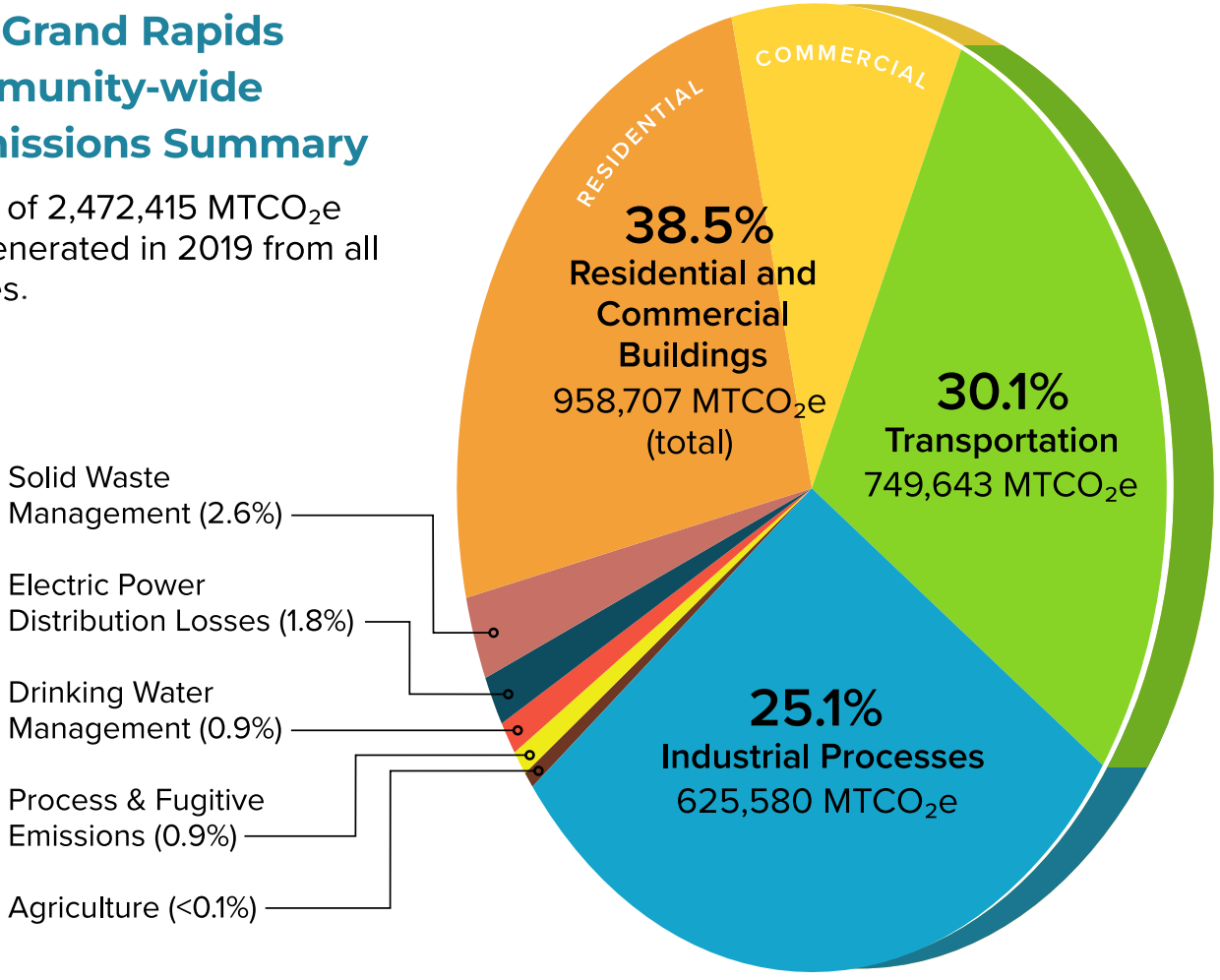
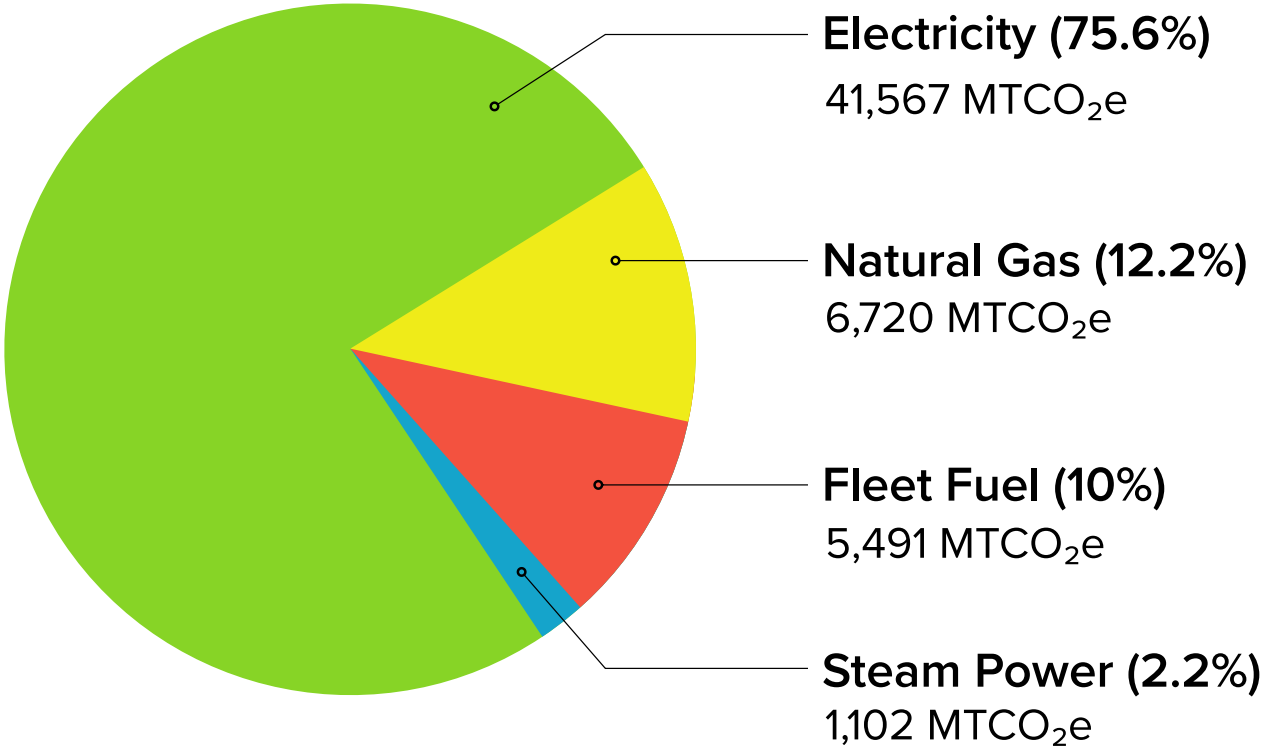


Figure 1: Community-Wide Emissions by Sector

The following fuel types are responsible for community-wide energy-related emissions: electricity (37%), natural gas (29%), gasoline (18%), diesel (7%) and other (9%). The inventory includes three GHGs including carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O).

Municipal operations account for 2.21% of community-wide emissions. The largest contributor to municipal operations is electricity with 76% of emissions. The next largest contributors are fuel for the fleet (12%) and natural gas (10%). Steam energy is responsible for the remaining (less than 3%) emissions.

2019 Grand Rapids Municipal Operations Emmissions Summary



Municipal operations account for 2.21% of community-wide emissions

Figure 2: Municipal Operations GHG Emissions

The GHG Inventory is based on 2019 data and was completed in November 2023 due to utility data finalization delays. Both Consumers Energy and DTE Energy provided actual 2019 consumption data for the emissions inventory. The utilities calculated total energy consumption based on their existing rates: residential,

commercial and industrial. Electricity generated and used on-site (typically via solar installations), as well as electricity emissions offset via renewable energy credits or carbon credits, is not included in the inventory as there is currently no data collection system for this information. Unfortunately, as there is no method of measuring and tracking total on-site renewable energy generation supplying buildings within the city of Grand Rapids, this is not currently accounted for in the emissions inventory.

This data will provide a baseline against which the City will be able to compare future performance and demonstrate progress in reducing emissions. To complete this inventory, the City utilized tools and guidelines from ICLEI – Local Governments for Sustainability (ICLEI), which provides authoritative direction for GHG emissions accounting and defines climate neutrality as follows:

"The targeted reduction of GHG emissions and GHG avoidance in government operations and across the community in all sectors to an absolute net-zero emission level at the latest by 2050."

To achieve aggressive emissions reduction goals and move towards climate neutrality, Grand Rapids must focus on energy efficiency, electrification, and renewable energy. Actions to reduce emissions in all of these sectors are a critical part of the Climate Action and Adaptation Plan.

Net-zero refers to the balance between the amount of GHG produced and the amount that's removed from the atmosphere. Balance can be achieved through a combination of emission reduction (producing less) and carbon capture (sequestration).

Community-Wide Science-Based Targets

The Intergovernmental Panel on Climate Change (IPCC) states that to meet the 2015 Paris Agreement commitment of keeping warming below 2.7°F (1.5°C), global emissions must be reduced by 50% of the 2019 level by 2030 and reach climate neutrality by 2050. Equitably reducing global emissions by 50% requires high-emitting, wealthy nations, that have generated the most GHGs to date, reduce their emissions by more than 50%. More than ever, it is imperative that countries, regions, and local governments set targets that are ambitious enough to slash GHG/carbon emissions between now and mid-century (2050) [1]. According to the 2023 IPCC Sixth Assessment Report, it is likely, or very likely, to exceed 2.7°F (1.5°C) under higher emission scenarios.

Science-Based Targets (SBTs) are calculated climate goals, in line with the latest climate science, that represent a community's fair share (taking into consideration wealthy nations generation of a larger portion of emissions to date) of the global ambition necessary to meet the 2015 Paris Agreement commitment to keep warming to below 2.7°F. (1.5°C).

To support the bold climate action needed in Grand Rapids, ICLEI calculated that City's SBTs in terms of per capita and absolute. Per capita refers to an average

emissions figure per person, and absolute refers to the total amount of community-wide GHGs. In November 2022, the City Manager approved the following SBTs:

- 62.8% per capita GHG reduction community-wide by 2030 from 2019 baseline emissions
- 100% per capita GHG reduction by 2050 from 2019 baseline emissions.

Figure 3 below projects what could be expected in a business-as-usual (BAU) scenario; where Grand Rapids continues on the current rate of GHG emissions reduction through 2030. The projected emissions estimated population growth, changes in automotive fuel efficiency standards, and anticipated changes to the carbon intensity of grid electricity. Sources for the projected emissions included 6.3% population growth from MDOT and 80% grid decarbonization by 2030 from Consumers based on Consumer Energy's 2021 Clean Energy Plan.

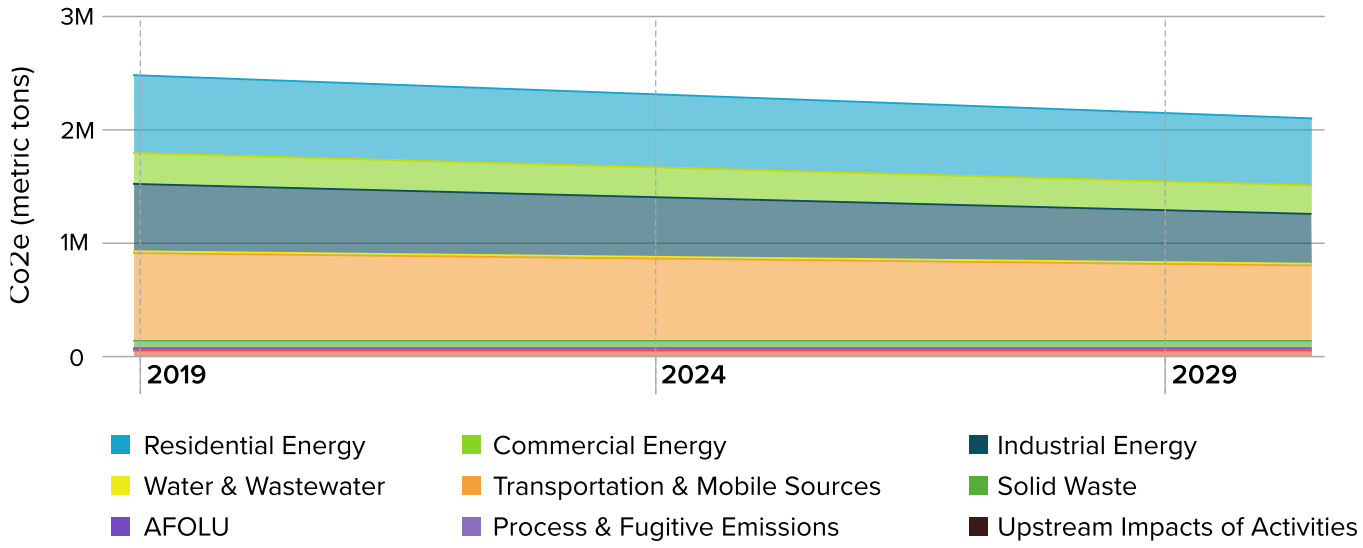


Figure 3: City of Grand Rapids BAU Projected CO_2e Values

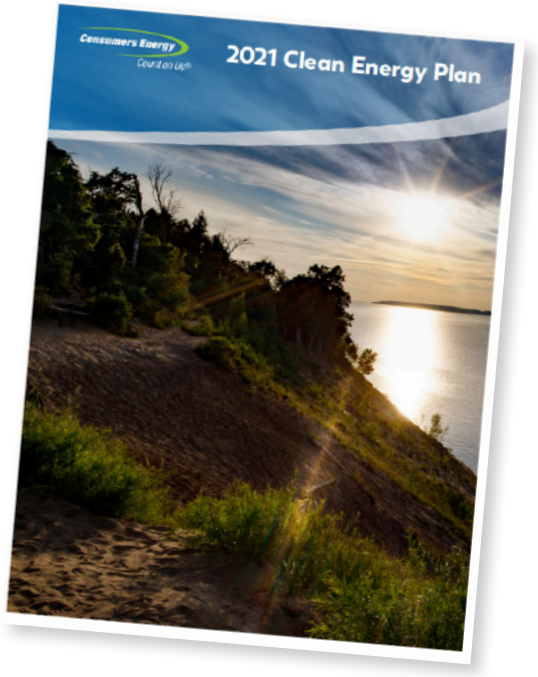
Considering all these factors Grand Rapids' 2030 emissions will be 2,105,309 $MTCO_2e$ – a 15.5% reduction from 2019 levels. [1] The only ways to reduce or eliminate GHG emissions from energy generation and distribution are:

- reduce or eliminate the consumption of energy
- reduce or eliminate methane and line losses from the transmission and distribution of natural gas and electricity respectively
- electrify vehicles, buildings, processes (eliminate on-site natural gas consumption)
- install or procure zero emissions energy such as renewably generated electricity or geothermal.

In order to meet the established SBTs a high impact assessment was conducted to determine how to achieve 62.8% GHG emissions reduction per capita by 2030. The solutions include:

- 80% electricity grid decarbonization by 2030
- 10% vehicle miles traveled reduction by 2030
- 22.5% of vehicle miles traveled is with electric vehicles by 2030
- 10% of all existing commercial buildings reduce energy 20% per year until 2030
- 5% of existing commercial buildings are electrified per year until 2030
- 5% of all existing residential buildings reduce energy 20% by 2030
- All new residential buildings and 1% of existing buildings will meet the 2018 International Energy Conservation Code (IECC)
- All new residential buildings and 11% of existing buildings are electrified per year until 2030

The Grand Rapids Climate Action & Adaptation Plan will act as a roadmap to reach these high-impact metrics. Consumers Energy will also play a key role in achieving community-wide goals as they work to decarbonize the electricity grid as laid out in **Consumers' 2021 Clean Energy Plan.**



Grand Rapids Climate Changes & Projections Summary

Great Lakes Integrated Sciences and Assessments (GLISA), in partnership with the City, created a summary of historic, as well as projected, changes in climate specific to Grand Rapids. This information helps us understand what changes we have already experienced as well as what changes we anticipate. The main takeaways are:

Increasing Temperature

- Historically Grand Rapids had on average 7.9 days per year over 90°F; by mid-century (2050) this is projected to rise from 20-38 days per year over 90°F.
- Average air temperature is projected to rise 3°F to 5°F by the mid-21st century (2050), with summer having the greatest increases of 4°F to 7°F.

Increasing Precipitation

- Total annual precipitation has increased by 16% from 1951 to 2017.
- Average annual precipitation in Grand Rapids is projected to increase by up to 3 inches by mid-century (2050) and by up to 7 inches by the end of the century (2100), though types of precipitation will vary (i.e. more winter precipitation in the form of rain).

Increase in Extreme Weather Events

- The total volume of rainfall in extreme events (heaviest 1% of storms) has increased by 52% since 1981.
- Grand Rapids is projected to experience an increase of up to 1.7 days of heavy precipitation (days with over 1 inch of rainfall) per year by mid-century (2050) and by up to 3 days per year by end of century (2100).

Essentially, Grand Rapids will see more days over 90°F in the summer and warmer days in the winter. Grand Rapids will also experience more rain and extreme weather events in shorter bursts that could cause an increase in the frequency and intensity of flooding and droughts. [2]

"In May of 2020, just after the pandemic, when the Sanford Dam was being washed away, we also had a storm in Grand Rapids and the flood waters rose around our house so that you couldn't even see land, except for across the River.

I could only access my house by kayak, and my dog didn't know where to go to the bathroom because there was no land.

And I think that climate change can be this sort of amorphous, hypothetical thing that feels like someone else's problem and some future day. But it's here now, and it affected us many times a year. It impacted our ability to work, it impacted our stress levels. And the thing about a river is it doesn't respect property lines or city lines."

– Comment at the Public Hearing for Climate Action, April 2025

Climate Risk & Vulnerability Assessment Summary

The Climate Risk and Vulnerability Assessment (CRVA) brings together climate information and insights on Grand Rapids' people, community systems, infrastructure, and natural resources to reveal local vulnerabilities to climate change. The City partnered with ICLEI—Local Governments for Sustainability USA (ICLEI USA) to complete the CRVA. Grand Rapids CRVA Working Group, composed of City staff and community members, provided local knowledge and perspectives underlying this CRVA's findings. The City also partnered with Community Collaboration on Climate Change (C4), a majority Black, Indigenous & People of Color (BIPOC)-led community-based organization (CBO), to host focus groups with community groups that are more likely to be vulnerable to the impacts of climate change.

Climate change does not affect everyone in Grand Rapids equally. People and communities who are historically disadvantaged, or burdened by pollution, are already experiencing the impacts of climate change "first and worst". [16] The City partnered with C4 to prioritize engagement with frontline communities through six focus groups held in May 2024. In these focus groups, 109 Grand Rapidians shared their concerns, needs, priorities, and aspirations for a climate-resilient Grand Rapids. The feedback from the focus groups and the CRVA Working Group provided the foundational experience that informed understanding Grand Rapids level of vulnerability.

Vulnerability is defined as the propensity or predisposition to be adversely affected by hazards [3]. Grand Rapids assessed the vulnerability of people, local systems and assets to climate change using three criteria: exposure, sensitivity, and adaptive capacity (Figure 4).

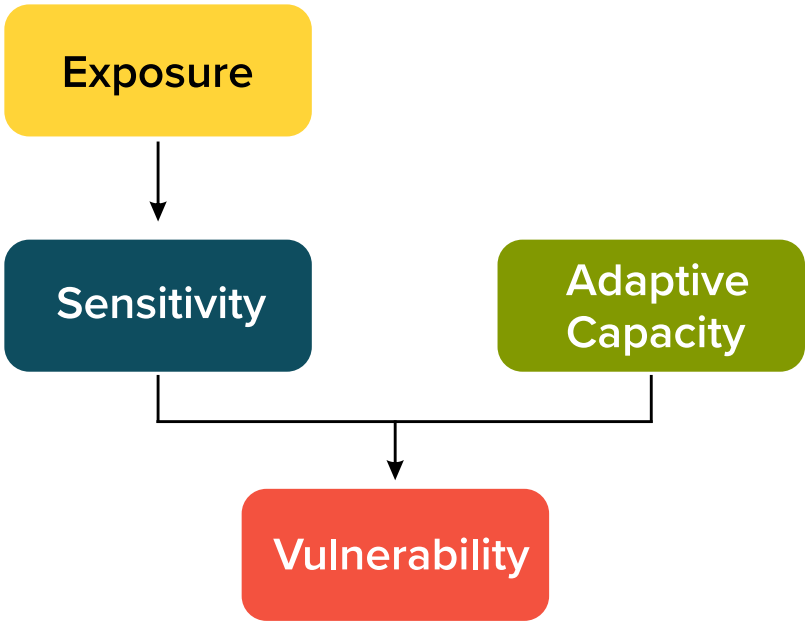


Figure 4: Components of vulnerability [3]

These terms are defined as follows:

- Exposure refers to whether an asset or system is located in an area that is likely to experience the effects of a climate hazard now or in the future.
- Sensitivity refers to how an asset or system fares when exposed to a climate hazard.
- Adaptive capacity refers to the ability of an asset or system to adjust or adapt to climate change.

The CRVA focused on four broad categories of hazards related to climate change:

1. Rising temperatures and extreme heat
2. Heavy rainfall and flooding
3. Severe convective storms (e.g., severe thunderstorms, hail or tornadoes)
4. Drought

Additional climate hazards, including wildfire smoke and warmer winters, are also addressed to a degree in the CRVA. The community experiences highlighted throughout the CRVA show climate hazards are already negatively affecting Grand Rapids. According to the best available climate data and research, hazard impacts will worsen as climate change accelerates.

To address the risk of hazards and taking into consideration the Grand Rapids community's vulnerability (established through data and community engagement) the following recommendations and potential implementation strategies were developed through the CRVA process. The recommendations highlight possible entryways to address the City's biggest threats and include:

- Prepare for more interconnected, complex, and cascading hazards
- Center equity and inclusion in resilience actions
- Integrate climate resilience cross-departmentally to accelerate progress while increasing efficiencies and avoiding costs down the road
- Tackle education and preparation for extreme heat
- Maintain momentum on flooding and stormwater management
- Get ahead of drought
- Bolster existing capacity to manage storms
- Make space and provide resources for Grand Rapidians to process their feelings on a changing climate
- Climate aware management of natural assets
- Engage with the business community

Grand Rapids will use the CRVA as a foundation for future efforts to build community resilience, advance equitable outcomes, support a healthy and clean environment, improve quality of life, and advance preparedness for all.

The City of Grand Rapids prioritizes green stormwater infrastructure to mimic the natural water cycle. Sustainable solutions like rain gardens slow down and spread out the flow of stormwater. The result is a cleaner river and more beautiful city.

Regional, National and Global Context

The City of Grand Rapids is committed to addressing the climate crisis by working towards the goals, strategies and actions outlined within this plan to achieve the adopted community-wide science-based targets (SBTs). However, it's important to note that achieving Grand Rapids community-wide SBTs will only be made possible with community buy-in and proceeding action. GHG emissions from local government operations are 2.21% of total community-wide emissions, leaving 97.79% of emissions outside of direct City control. The City will act as a leader for this work by modeling emissions reductions in municipal facilities and fleet, implementing actions under local control (e.g., land use planning and zoning) and working collaboratively to bring other community stakeholders to the table to consider innovative solutions for community progress.

Another key consideration for the City is that climate change does not end at city boundaries, but is instead a global issue that requires collaboration, engagement and advocacy across regional, state and national boundaries. While GHG emissions are generated locally, all globally produced emissions combine in the lower atmosphere to collectively cause climate change. Grand Rapids will work to reduce GHG emissions locally, but without global GHG emissions reduction local climate change hazards and impacts will continue to be seen, emphasizing the importance of climate adaptation actions.

In the United States, former President Biden made significant investment in climate change through executive orders (restoring the United States' participation in the 2015 Paris Agreement, Justice40, renewable energy and GHG emissions reduction targets) and legislation (IRA - Inflation Reduction Act). However, within the first week of President Trump's second presidency the United States withdrew from the Paris Agreement, declared a national energy emergency urging oil and gas expansion, eliminated the Justice40 program, and revoked former President Biden's goals for electric vehicles (EVs). Since the first week of President Trump's presidency, the climate change landscape at the federal level changes daily and provides an increasing amount of uncertainty. A number of climate and environmental justice grants funded through the IRA have been paused with potential for rescission. Federal agency regulatory authority has been stripped and capacity has been diminished through mass layoffs in the Environmental Protection Agency (EPA), Department of Energy (DOE), Federal Emergency Management Agency (FEMA), and National Oceanic and Atmospheric Administration (NOAA). Although the City of Grand Rapids may not have the ability to control national policy decisions with unknown federal support, local leadership will be more important than ever in advocacy and lobbying efforts. The City is committed to pursuing funding opportunities that remain available from the Inflation Reduction Act and to continue advocating for climate actions at a federal level.

The State of Michigan with Governor Whitmer's leadership maintains a commitment to a clean energy future through the State's MI Healthy Climate Plan and commitment to achieve carbon neutrality by 2050. However, with another election cycle in 2026, uncertainty remains on the longevity of support. With legislation controlled at the state level, the City is committed to lobby for continued legislative movement (e.g. community solar bill) and will continue to partner with state agencies like the Michigan Department of Environment, Great Lakes and Energy (EGLE) and the Michigan Department of Licensing and Regulatory Affairs (LARA) to further climate action.

MIHCP Dashboard

Lastly, The City of Grand Rapids is committed to working regionally with surrounding municipalities, counties, and regional planning agencies to collaborate on GHG emission reduction projects (e.g. Grand Valley Metro Council's West Michigan Healthy Climate Plan) and opportunities to minimize climate impacts regionally (e.g. Regional Hazard Mitigation Plan).

Climate Justice:
Incorporating Equity Into Climate

Image: GRPL

Understanding Our History

Indigenous peoples have been living in the Grand Rapids area since time immemorial. For the past 2,000 years, various tribes and cultures have been living, hunting, growing, and traveling along Owashtanong ("farflowing river" in Anishinabek), also known as the Grand River. The People of the Three Fires – an alliance of the Ottawa (Odawa), Chippewa (Ojibwa), and Potawatomi (Bodewadi) – established villages across the region. One of the largest villages and main gathering places of the Ottawa was in present-day downtown Grand Rapids. The people of the Three Fires remain present and connected to the area despite a history of colonization and displacement. [4]

Fur traders and missionaries from the United States and Europe entered the region and colonizers soon followed to settle – often by force. In 1821, the Treaty of Chicago gave the United States control of the land south of the Grand River, with exceptions for native reservations. With the threat of forced removal after the 1830 Indian Removal Act, tribes also signed the unfavorable Treaty of 1836 and ceded millions more acres of land north of the Grand River. At that point, the boundaries of today's Grand Rapids were now completely ceded to the U.S. government. As land was taken and native populations were displaced and institutionalized, the population of white settlers continued to expand. The Village of Grand Rapids, purchased and named by Louis Campau, grew from three-quarters of a mile to four square miles,

Image: Grand Rapids Public Library

and eventually to a city of 10.5 square miles in 1857. Industry in Grand Rapids shifted from fur-trading posts into a booming lumber and furniture hub. [4] The region's industrialization greatly impacted the river and surrounding natural landscape, as development increased, and the Grand River became a dumping ground for human and industrial waste. The eventual passage of the Federal Clean Water Act in 1972 would create environmental regulation to push for the restoration of waterways.

During the Great Depression Michigan banks collapsed, including six in Grand Rapids. To stabilize the housing market the Roosevelt administration created new agencies such as the Home Owner's Loan Corporation (HOLC). In the late 1930s the HOLC began the practice known today as redlining. Redlining was a practice developed by multiple real estate and public sector actors to adopt color-coded maps to identify areas of "riskiness" for housing investment and mortgage lending —which relied explicitly on racist assumptions. The risk maps created four color-coded categories into which neighborhoods were rated: A (Green - Best), B (Blue - Still Desirable), C (Yellow - Declining), and D (Red - Hazardous). [6]

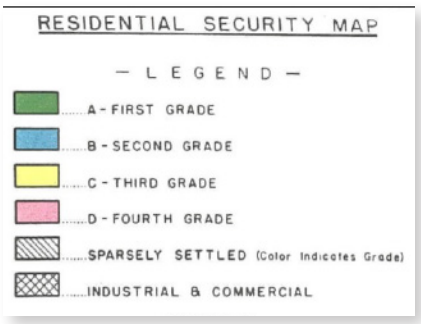


Image of the HOLC legend. Published in November, 1937.

The HOLC redlined Grand Rapids on November 5th, 1937. Consistent with the requirement of the government Underwriting Manual, the redlining specifically targeted residents of color in Grand Rapids; deeming their neighborhoods as "hazardous" to investment because they had residents of color or were in proximity to residents of color. The HOLC, in partnership with the Federal Housing Administration (FHA) and private banks, used these risk maps to deny home loans in communities impacted by redlining practices, even when the applicant may have otherwise been eligible for the loan. The FHA continued to use neighborhood composition in drafting its loan underwriting guidelines until 1949. The policies were upheld by local governments which used the maps to direct funds and resources such as public water and sewer to higher-rated white neighborhoods, while exclusionary zoning policies were often drafted in a manner that reflected the redlining of previous generations. The biased homebuying market kept Grand Rapids' neighborhoods mostly segregated for decades. A 1964 report from the Grand Rapids Urban League found that 88% of the city's Black families lived within five census tracts of land in the city. [5]

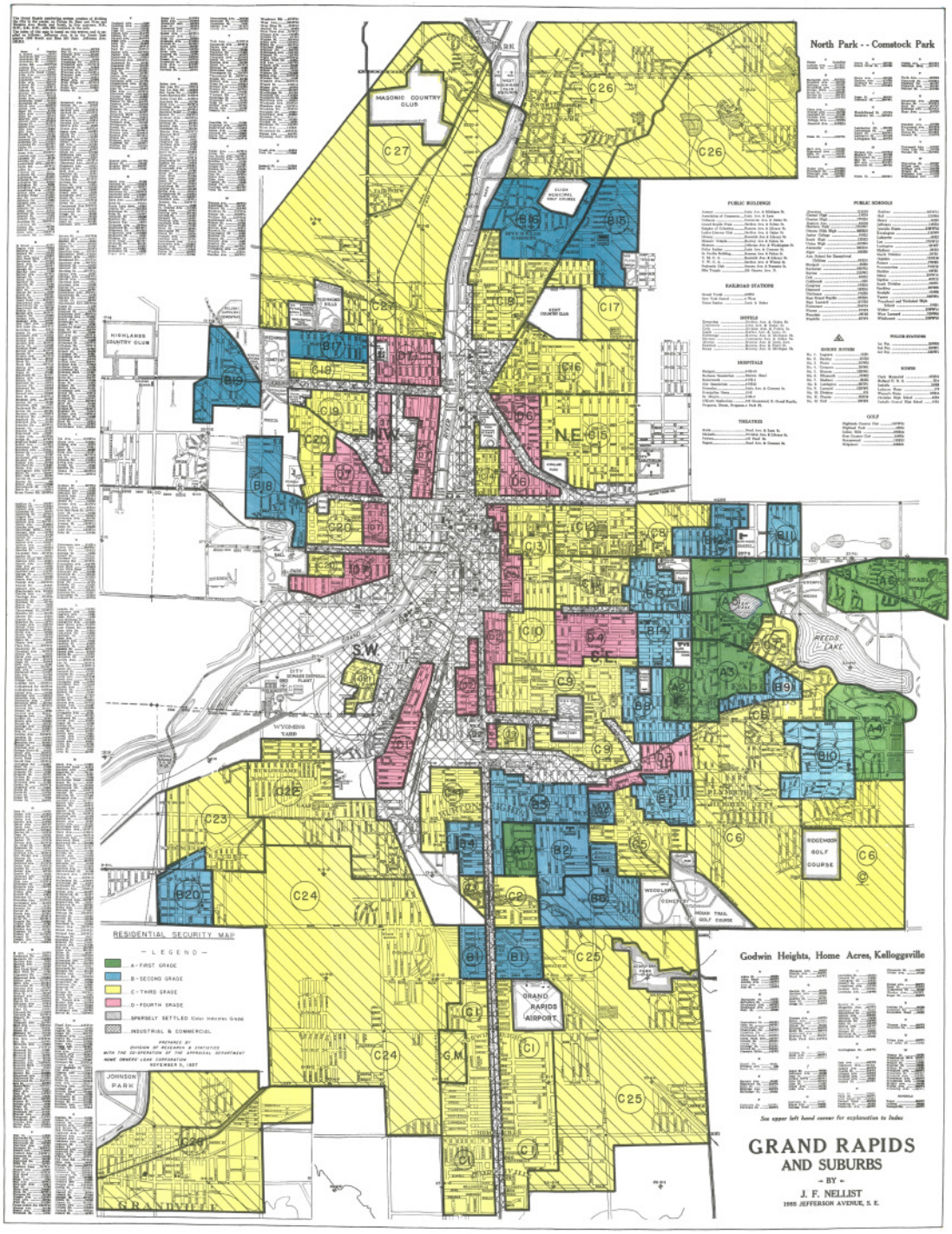


Figure 5: Original Grand Rapids Home Owner's Loan Corporation (HOLC) Redlining Map [6]

As part of the **2024 Community Master Plan** an overlay map was created with the original redlining boundaries with the City's Neighborhoods of Focus (NOF). NOF are City of Grand Rapids census tracts with the highest percentage of BIPOC residents and the greatest disparities across all quality-of-life indicators such as education, wealth, and employment.

HOLC Map of Grand Rapids with Current Neighborhoods of Focus (NOF)

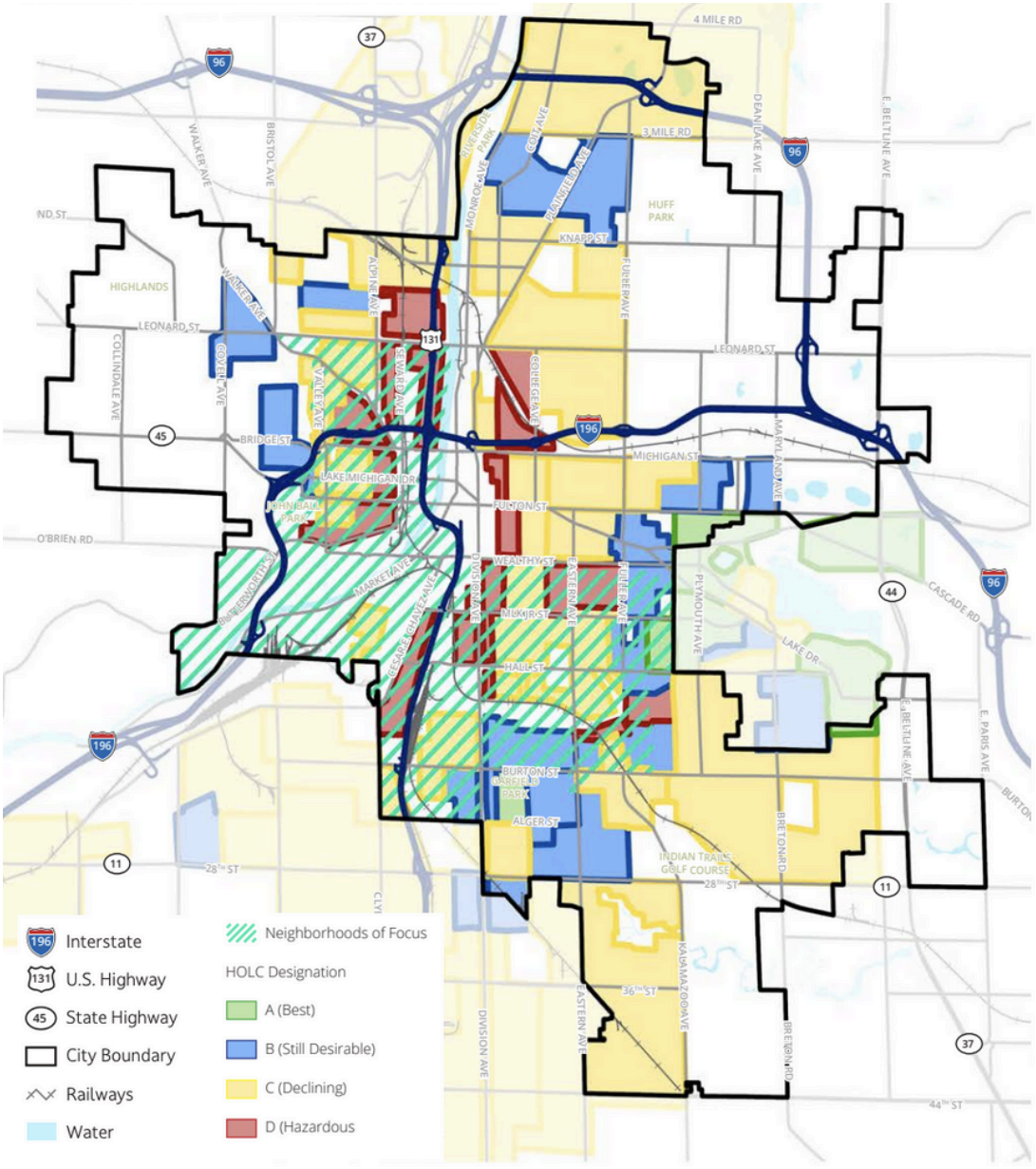


Figure 6: Community Master Plan HOLC Map of Grand Rapids with NOF Overlay

The legacy of these policies continues today and has resulted in large disparities in resources and services while constraining residential choices. Redlining effected the way our physical environment developed and how our land was used in Grand Rapids. The effects of this racist practice are an important consideration as we look to decide on equitable solutions in our community.

Discriminatory practices of redlining led to racial segregation, racial tension and civil unrest. The Grand Rapids Uprising occurred on July 25, 1967, in a predominantly Black and impoverished neighborhood. It was estimated that 1,000 people, both Black and white, participated in the uprising with 44 injuries, no deaths, and 30 arrests. Firefighters responded to 54 fires during an 11-hour period with damage estimated to be about $500,000, which now amounts to about $3.5 million when adjusted for inflation. [7]

While redlining was outlawed in the Fair Housing Act of 1968, disparities in resources and prejudicial treatment of communities of color continue to the present. The murder of George Floyd, a 46-year-old Black man, drew widespread outrage in May 2020 after a video circulated online showing then Minneapolis Police Officer Derek Chauvin holding his knee on Mr. Floyd's neck on a Minneapolis street corner as he gasped for breath. George Floyd's death spurred nationwide protests against police brutality. Thousands of demonstrators marched in downtown Grand Rapids on Saturday, May 30, 2020, in response to the murder of George Floyd. In the early morning hours of May 31, looting and fires spread throughout downtown Grand Rapids impacting infrastructure and air quality. The mayor of Grand Rapids, Rosalynn Bliss, enforced a curfew until June 2 and requested the support of an unarmed Michigan National Guard to secure the Grand Rapids Police Department and to help board up impacted businesses. Damage was estimated to be over $1 million. [7]

In April 2022, another wave of mass protests occurred in Grand Rapids due to the shooting and killing of local resident Patrick Lyoya, a 26-year-old Black man and refugee from the Democratic Republic of Congo, by then Grand Rapids Police Officer Christopher Schurr. The Grand Rapids Police Department placed Schurr on administrative leave and fired him upon results of an investigation. Patrick Lyoya's killing prompted calls for reforms in Grand Rapids police policies, particularly regarding the use of deadly force in handling traffic stops and the need for transparency in police interactions with the public through body camera usage. [8]

Reflecting not only historical harms and disparities but addressing the inequities that grew from history and affect residents today is a necessity in moving toward equitable community solutions and a broader call for justice.

Today's Injustices and Climate Impacts

The displacement of Indigenous peoples from the Grand River forcibly removed caretakers of the land who protected local ecosystems and preserved biodiversity by employing a variety of regenerative land practices such as agroforestry (planting trees alongside crops), intercropping (growing multiple crops together), controlled burning to manage grasslands, rotational grazing, and permaculture (agricultural systems that mimic natural patterns). [9] Colonization and the industrialization that followed their displacement are key contributors to the climate crisis we face today.

Redlining, and the lack of investment in neighborhoods of color following redlining, has created a cascading effect on residents' lives today. As noted in Understanding Our History, areas that underwent government sanctioned segregation in the past correlate with NOFs and have higher concentrations of BIPOC residents due to historical segregation. These same communities were not provided equitable access to resources and investment leading to modern day neighborhoods (NOFs) with less tree canopy, larger amounts of impervious surfaces, and therefore more vulnerable to two of Grand Rapids key climate hazards: extreme heat and flooding.

Neighborhoods with denser tree canopies are cooler than neighborhoods with less dense tree canopies because of shade and evapotranspiration (the release of water into the air by trees). The leaves of trees catch and store rain, and the roots help to reduce flooding by drawing water into the plant and out of our streets and rivers. In these ways, tree canopies reduce risks of both heat and flooding. Leaving NOFs and communities of color more vulnerable to the effects of climate change (both heat and flooding). [10]

A Changing Climate

"Poor air quality impacts my ability to go outside and do the things I enjoy: like take my dogs on a walk. The lack of rain, and then downpour, makes a big impact on my property in the city."

– CAAP Survey Respondents, March 2023

The risk of flooding is much higher in communities with a large coverage of impervious surfaces such as parking lots, roads, sidewalks, and driveways. These surfaces prevent rain or snowmelt from being absorbed into the ground below and instead create stormwater.[11] This runoff can move pollution, such as salt, oil, or dirt, into our streams and lakes. A large area of impervious surfaces, especially dark-colored asphalt or pavement, will also raise the temperature as it absorbs radiation from the Sun.[12] This heat is re-radiated back into the atmosphere and can increase the surface temperature by several degrees. Our NOFs that have high coverage of parking lots, asphalt rooftops, and cement will suffer the worst consequences of the urban heat island effect.

When low-income or marginalized communities are harmed by hazardous waste, resource extraction, and other land uses from which they do not benefit this is called

environmental injustice. In 2019, the University of Michigan completed a report on environmental injustice in the state of Michigan, and out of the top 10 census tracts, 5 of them were located in Grand Rapids – specifically where our communities of color reside. [13] Today in Grand Rapids we can see in Figure 7 that there is overlap in where industrial zoning is present and where our Black and Brown communities reside. This correlates with health issues in community including poor air quality, and high concentrations of asthma, lead poisoning, and negative birth outcomes.

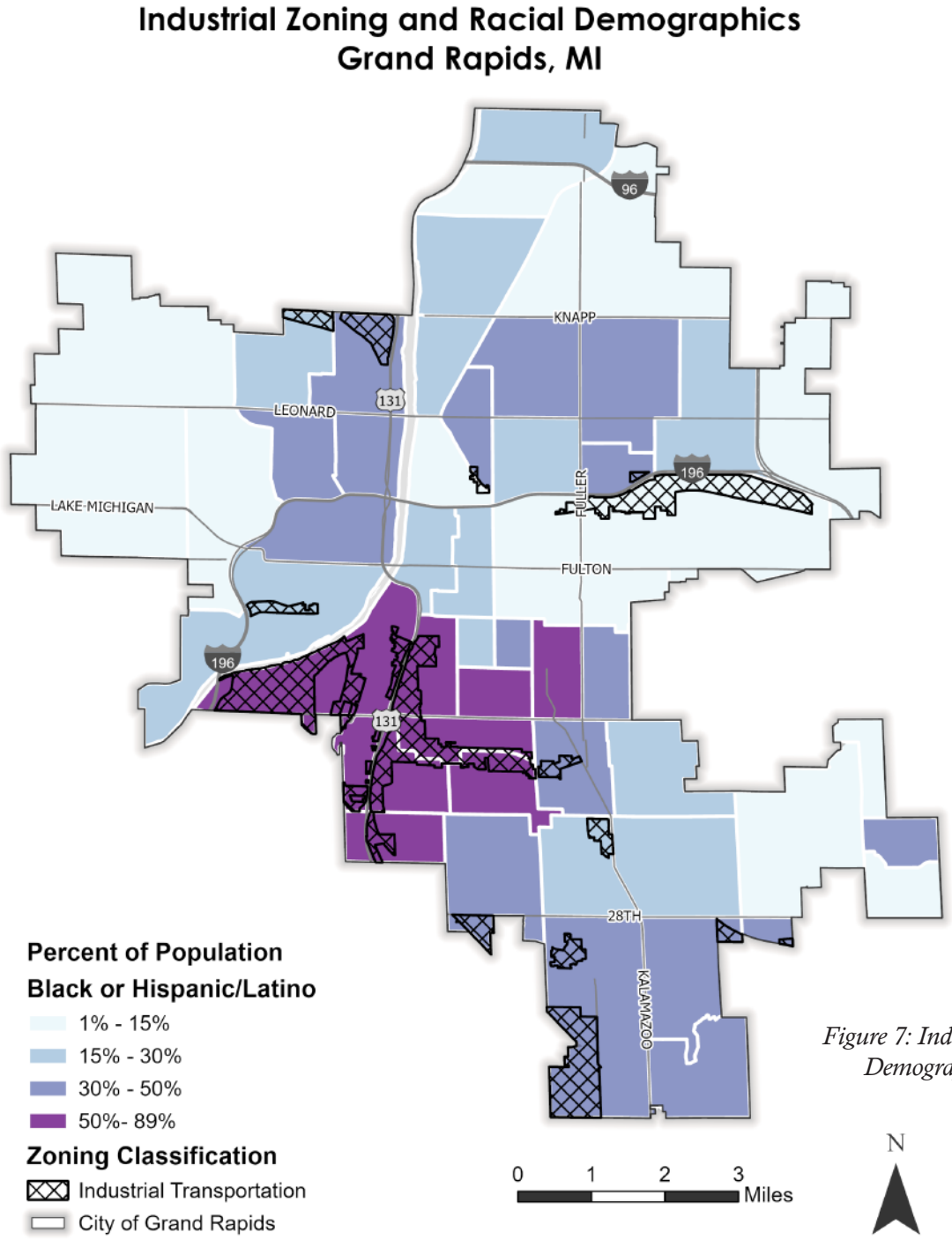


Figure 7: Industrial Zoning and Racial Demographic Overlay Map [3]

While the correlations are clear, land use and zoning can provide solutions as well. Some cities have created "green zones or eco-districts" to promote a variety of sustainable practices including giving higher scrutiny for proposed sources of pollution in the green zone.

Lastly, increasing feelings of safety and welcoming in community will contribute to climate resilience. Residents of color expressed during the Community Master Plan engagement process unease with accessing existing greenspace due to police presence in parks. Encouraging use and sense of ownership of greenspaces, hosting cultural events, and maintaining open dialogue with community to understand their needs and opportunities to build relationships are essential to minimize adverse climate impacts that access to greenspace can mitigate (e.g., heat hazard, reduction in physical and mental health).

Michigan has the potential to see an increase in climate-related migration, which refers to the movement of people influenced by climate change. [14] After the killing of Patrick Lyoya, the African immigrant community expressed grief that after immigrating to the United States to escape violence, they no longer felt safe or welcome in Grand Rapids. [8] As more extreme impacts of climate change (sea level rise, wildfires, hurricanes, etc.) affect other parts of the world and the country, Grand Rapids will need to continue to work on welcoming initiatives — like the goals, recommendations and strategies laid out in the **Kent County Welcome Plan** — to ensure the Grand Rapids community is prepared to create a safe and inclusive environment for potential climate migrants. [15]

The City recognizes that climate change adds to the burdens of residents already facing industrial pollution, low tree canopy, and disparities in health and financial security. The intersection of these challenges makes it difficult for these communities to build resilience and respond to the growing threats posed by climate change. The Grand Rapids Climate Action and Adaptation Plan seeks to address historical inequities and disproportionate climate impacts by centering an equity-focused approach — developing strategies and actions that prioritize providing opportunities to vulnerable communities and minimizing climate risks.

Plan Introduction

Shared Equity Vision

Purpose

A Climate Action and Adaptation Plan (CAAP) is a road map for how a community will reduce greenhouse gas emissions and prepare for the impacts of climate change on people, the environment and infrastructure. The CAAP is considered an educational resource as well as an action-based guide for City work.

Vision

Grand Rapids will be a resilient, low-carbon city that centers equity in climate solutions to ensure a safe and healthy community.

Equity Focused Approach

On September 28, 2021, the Grand Rapids City Commission passed a resolution declaring a climate change a crisis. The City Commission acknowledged that climate change is both one of the most urgent and complex challenges of our lifetime. The impacts of climate change are not solely about the environment, but about people. All residents, regardless of socioeconomic status, will feel climate impacts and many impacts are projected to worsen. However, individuals will not experience these changes equally. A report by the Environmental Protection Agency (EPA) found that four socially vulnerable populations may be more exposed to the highest level of climate change: [16]

- low-income communities
- Black, indigenous, and people of color (BIPOC)
- educational attainment below a high school graduate level
- individuals ages 65 and older

Understanding the comparative risks to vulnerable populations is critical for developing effective and equitable strategies for responding to climate change.

A just climate future is...

"Equity in implementation of climate change solutions. I live in the 49507 where we suffer the most from climate change impacts and environmental hazards but receive few resources and little support. I'd like to see more tree cover, more public transportation, improved waste systems such as city wide composting and a better energy grid."

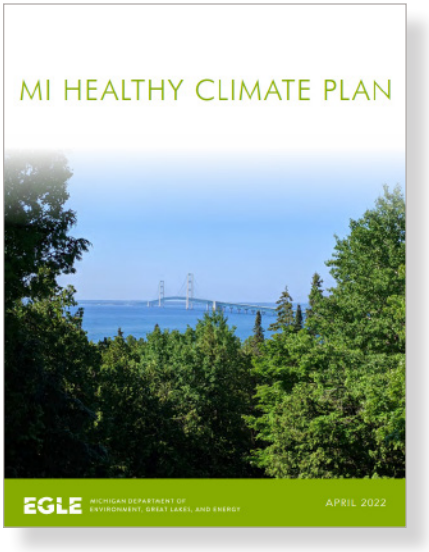
– CAAP Survey Respondent, May 2023

The City of Grand Rapids is dedicated to advancing equitable outcomes and opportunities by leading with racial equity to address root causes of disparities. The City defines equity as the condition achieved when people have the tools, resources and connections necessary to be fully engaged, and prepared to benefit from the opportunities they seek. Racial equity is achieved when one's race or ethnicity does not determine, in a statistical sense, how one experiences opportunity, power, and life outcomes. This targeted approach on racial equity will advance our universal goal of being a resilient, low carbon city in Grand Rapids. Equity is one of the City's six core values and is embedded into all decisions, policies, plans and practices.

Complementary Plans

Climate change intersects with a variety of planning topics, and thus this plan is built off the work of the planning efforts that came before it. The following plans and processes have informed the strategies and actions in the CAAP.

MI Healthy Climate Plan (2022)



The State's action plan to reduce greenhouse gas emissions and transition toward economy-wide carbon neutrality. The MI Healthy Climate Plan lays out a pathway for Michigan to reach 100% carbon neutrality by 2050 to avert the worst impacts of the climate crisis, create good-paying jobs, and build a healthier and more prosperous, equitable, and sustainable Michigan for all Michiganders.

West Michigan Healthy Climate Plan PCAP (2024)

A comprehensive climate action plan for reducing GHG emissions in Ionia, Kent, Montcalm, and Ottawa Counties prepared by the Grand Valley Metro Council. This plan connects and uplift existing state, regional and local plans, while preparing communities to pursue funding opportunities through implementation-ready measures to reduce GHG emissions.

Regional Hazard Mitigation Plan (2022)

The plan identifies risks, vulnerabilities, and mitigative efforts to prepare for and respond to hazards present in the communities in Kent County, Ottawa County, and the City of Grand Rapids. The plan is a regional partnership of Kent County, Ottawa County and the City of Grand Rapids.

Bicycle Action Plan (2019)

The Bicycle Action Plan provides a vision for bicycling in Grand Rapids, as well as information on the City's current bicycling infrastructure, programs, policies and culture.

GVMC Transportation Demand Management Plan (2023)

The Transportation Demand Management Plan uses strategies to inform and encourage travelers to maximize the efficiency and interconnection of our transportation systems, leading to improved mobility, reduced congestion, and lower vehicle emissions.

The Rapid Transit Master Plan (In Process)

The Transit Master Plan (TMP) will strategically guide The Rapid to build a sustainable transit system to serve metropolitan Grand Rapids and the surrounding region.

Parks and Recreation Strategic Master Plan (2022)

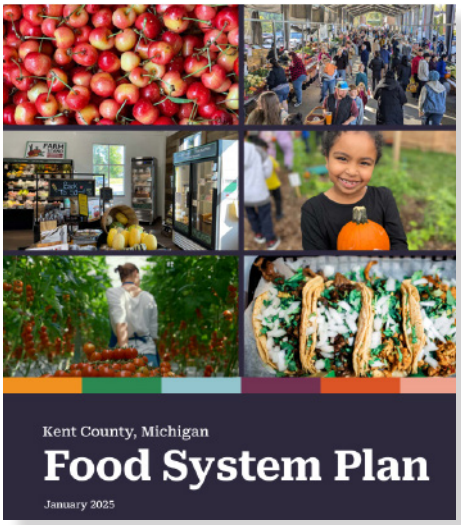
A road map for the long-term development and sustainability of the City's park system.

Lower Grand River Watershed Resilience Action Plan (2024)

A plan intended to assist municipal governments, communities, stakeholders, and citizen groups throughout the Lower Grand River Watershed to become agents for positive change in the pursuit of higher water quality.

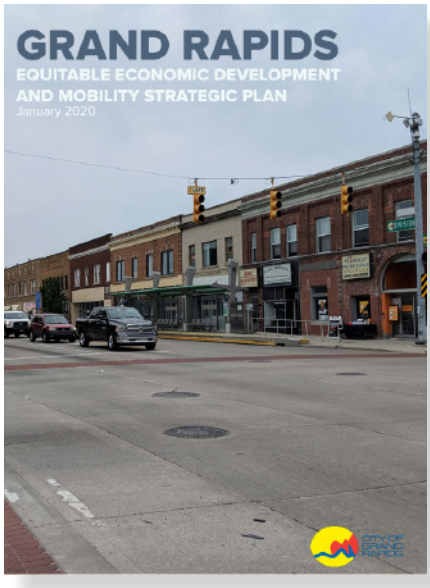
Kent County Food Policy Assessment & Plan (2025)

A plan to create a healthy, sustainable regional food system that brings economic, environmental, and social benefits to the community by aligning policies, such as ordinances, zoning, and incentives to support the local food system.



Vital Streets Plan (2016)

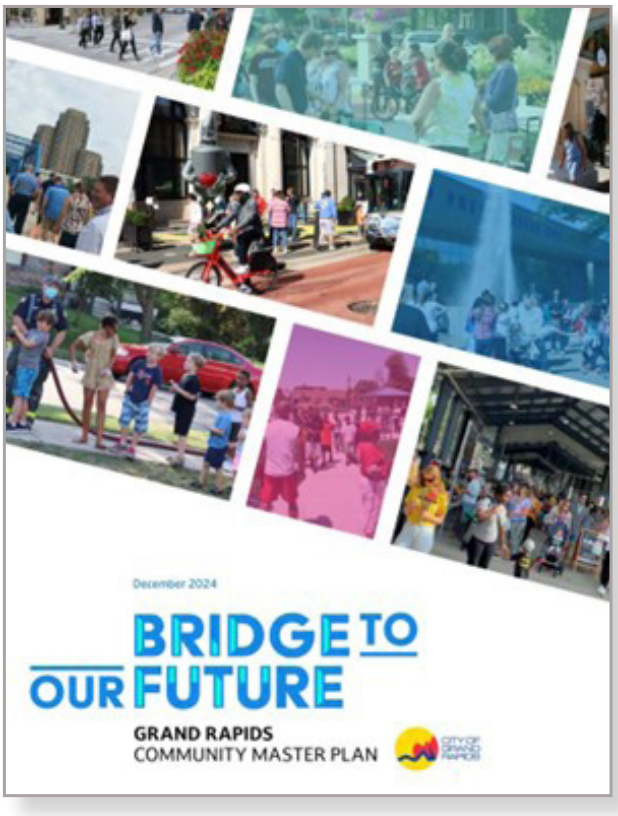
The Vital Streets Plan incorporates the concept of complete streets and green infrastructure into one framework for designing a network of city streets and rights-of-ways that are accessible, attractive, multimodal and safe. Vital Streets serves all people of our community; by contributing to the livability of our neighborhoods and business districts, protecting the quality of our river, and increasing economic opportunity to individuals, businesses, and new development.



Equitable Economic Development and Strategic Mobility Plan (2020)

The Equitable Economic Development and Mobility Strategic Plan evaluates current programs and practices through a lens of equity and crafts a community-defined goal for equitable economic development and mobility, as well as a set of actionable strategies that the City is committed to implementing to realize this goal.

Grand Rapids Community Master Plan (2024)



In fall 2022, the City of Grand Rapids launched Bridge to Our Future, a process to create a new Community Master Plan (CMP). The previous Master Plan was adopted in 2002 and has been updated in the years since, but new challenges and opportunities called for a new plan. Bridge to Our Future was a community-driven process that focused on engaging residents of all backgrounds throughout the city. The result is a plan that includes a community-generated vision statement, value threads, goal areas, and specific recommendations to guide the future physical development of the city. The Community Master Plan sets a long-term direction for the city's growth and development and serves as a guide for decision-makers and the community for future development over the next 20 years.

The CAAP works in collaboration with the adopted CMP following its bold, 20-year vision for the city's growth and development by addressing land use concepts related to equity, housing, sustainability, and economic development. The CAAP includes 54 strategies or actions that correspond directly with CMP recommendations across the chapters of Great Neighborhoods, Vital Business Districts, A Strong Economy and Balanced Mobility.

The CAAP closely mirrored the CMP process and timeline and enabled staff to incorporate CMP engagement feedback specific to climate change and environmental justice into the CAAP. Overlap with the CMP will be indicated throughout the CAAP by references to the CMP chapter, objectives, and recommendations, e.g., [CMP 1.C.4].

Engagement Overview

The CAAP was created from a mixture of data on GHG emissions, the climate risk and vulnerability of the Grand Rapids community, existing community plans, and the lived experiences of residents and business owners. The process to create the plan followed the timeline below.

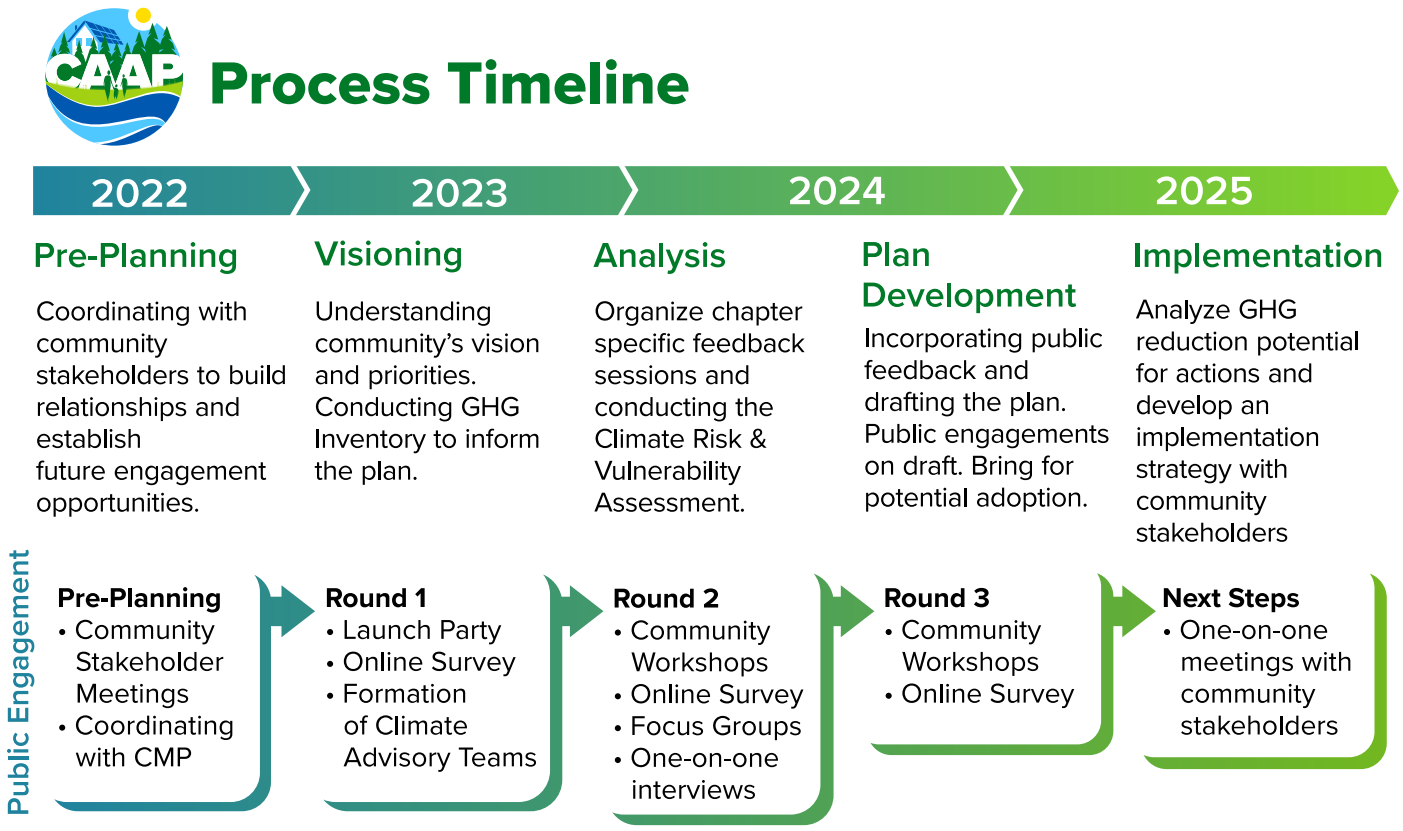


Figure 8: CAAP Process Timeline

Pre-Planning Process

Before commencing the CAAP process, the City of Grand Rapids worked with an intersection of 20 local BIPOC leaders and traditional white environmentalists to create the framework for the community-based organization, Community Collaboration on Climate Change or C4. The vision of the C4 was to create a climate justice movement. The City partnered with the C4 to design a planning process that would focus on a targeted universalism approach. Targeted universalism is a process that includes setting universal goals and assessing how different groups in the community fare relative to the goals. Barriers, structural impediments, and resource deficiencies are addressed directly to ensure all groups achieve the goals. In practice, the CAAP's target universalism approach centered community engagement on those most likely to face barriers to participation, including residents who are unhoused, identify as BIPOC, youth and seniors, and Spanish-speaking communities.

C4 Community Collaboration on Climate Change

The planning process was designed to include three rounds of community feedback opportunities. The C4 created a CAAP Committee to plan the engagement events, provide feedback on the CAAP process, and review drafted recommendations through the planning process.

Visioning: Round 1 Engagement

March 2023 – February 2024

Outreach began in March 2023 with a "Call to Climate Justice" kickoff event held in partnership with the C4 at the Center for Community Transformation. The kickoff featured a free dinner for attendees from four BIPOC-owned caterers, free childcare services, and translation services for Spanish and Swahili. There were also complementary shuttles available for unhoused individuals that provided transportation to and from the event. The kickoff included resource tables for community and engagement focused on facilitated group table activities with discussion among attendees. Community members provided their insight on the following three questions at the tables:

- **Q1: What is climate change?**
- **Q2: What is climate justice?**
- **Q3: What climate actions can you take?**

An online survey was introduced to the community at the C4 kickoff event and distributed while tabling at a variety of diverse community events in 2023. Residents provided their insight on the following questions:

- **Q1: How does a changing climate affect you?**
- **Q2: What are your top 3 priorities for this climate plan?**
- **Q3: What does a just climate future in Grand Rapids look like to you?**

"I hope that you all can look at the plan as a seed that we can build upon. We understand that it is ambitious, but it needs to be.
And I think what I would say is anything transformational doesn't didn't seem realistic in the beginning, but it takes the seeds and us to work together as a community to reach those ambitious goals."

– Comment at the Public Hearing for Climate Action, April 2025

For Question 1, key themes emerged on how a changing climate affects respondents and includes harm to their physical and mental health, increasing energy bills, and disruption to outdoor activities.

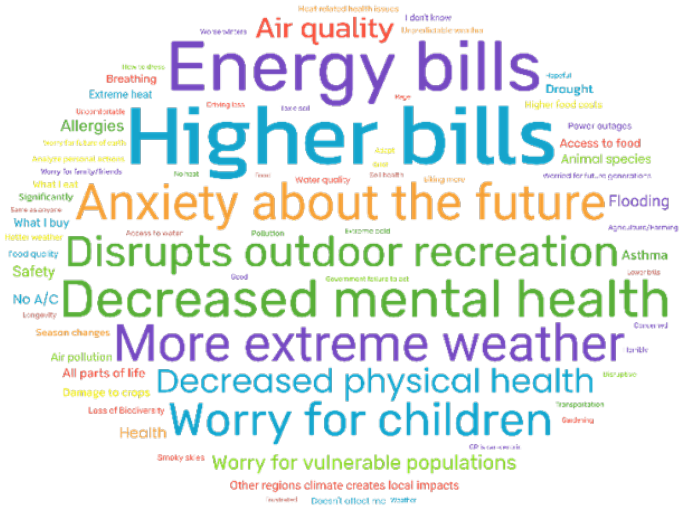


Figure 9: Word cloud for Q1: How does a changing climate affect you?

Figure 10: Word cloud for Q3: What does a just climate future in Grand Rapids look like to you?

For Question 2 the top three priorities from community were Energy Generation, Food Systems, and Transportation. Lastly for Question 3, five major themes surfaced.

A just climate future looks like...

...affordability and access to resources for resiliency and preparedness.

...ethical practices such as equity, inclusion, transparency, accountability, and prioritizing underserved communities and those at higher risk.

...sustainable policy changes.

...resilient practices such as trees, native plants, and local food systems.

...mental health support and community aid.

In June 2023, the C4 hosted the Eco-Justice Jam Poetry Slam to allow local artists to share their climate stories amongst community. The event was planned through C4 Ambassadors and focused on increasing connection to climate justice in ways that feel authentic and positive to community – sharing a meal, art, music, and games.

Using the results of the Greenhouse Gas emissions Inventory Report, the CAAP Visioning Survey, as well as mapping community resources, the City began to identify if Climate Advisory Teams (CAT) should be created for any sector. The priority of the CATs was to bring together local stakeholders across different fields to create draft strategies and actions for the climate plan. CATs were created for the Transportation, Commercial Buildings, and Residential Housing sectors as no active local multi-stakeholder groups existed on these subjects that addressed climate change. The CATs met monthly to draft key sector strategies and actions. A total of 81 individuals participated across three CATs. For the Commercial Building CAT representatives from the GR Chamber, Rockford Construction and The Right Place participated in the process, but have unresolved concerns that are not reflected in the Commercial Buildings chapter. The strategies and actions for the key sectors of Energy Systems, Nature Based Solutions, and Food Systems were drafted based on multiple rounds of survey feedback, focus groups and 1-on-1 meetings with local subject matter experts.

The Climate Risk and Vulnerability Assessment (CRVA) process, in partnership with ICLEI, began concurrently with the Round 1 Visioning process and concluded before the end of the Round 2 Analysis process to ensure the results were incorporated into the development of the CAAP. The City began the CRVA process by convening staff and community stakeholders as members of the CRVA Working Group in October 2023. Participants represented a range of City departments as well as community expertise and interests. CRVA Working Group members participated in virtual meetings and in-person workshops to complete the CRVA work. During meetings and workshops, participants got to know each other; learned about CRVAs and climate change adaptation; brainstormed climate change impacts in Grand Rapids; shared insights on community systems, vulnerabilities, and risks; reviewed deliverables; and shared priorities for adaptation action.

Local Governments for Sustainability, (originally International Council for Local Environmental Initiatives or ICLEI), is an international collaboration of over 2,500 governments committed to sustainable urban development.

Analysis: Round 2
February 2024 – October 2024

Climate Advisory Teams met monthly to finish drafting key sectors strategies and actions. The strategies and actions for the key sectors of Energy Systems, Nature Based Solutions, and Food Systems were drafted based on multiple rounds of survey feedback, focus groups and 1-on-1 meetings with local subject matter experts.

In May 2024, the community was engaged in the CRVA process with six in-person focus groups organized and hosted by C4. For the focus groups, C4 Ambassadors held in-person gatherings to engage with residents. The focus groups discussed participants past experiences with heat and flooding, possible future impacts of heat and flooding, coping mechanisms used, what residents need from the City, and ideas for a resilient future in Grand Rapids. Five focus groups explored heat, one of which was completed in Spanish. Two of the focus groups were composed mainly of younger and older African Americans. One group focused on flooding and was largely unhoused residents.

Location	Date(2024)	Attendees	Topic and Demographic (if noted)
King building	May 9	10	Heat
Cook Library	May 20	20	Heat (Spanish language)
GR Proactive, Division Ave S	May 23	21	Flooding (unhoused demographic)
Metro Night Club	May 26	18	Heat (20-30 years old)
Twelve 'O One Soul	May 28	20	Heat (youth to seniors; mainly African Americans)
Samaria J's Salon	May 30	20	Heat (youth to seniors; mainly African Americans)

Table 1: Grand Rapids Climate Risk & Vulnerability Assessment Focus Group Dates & Attendance

Once all key sector chapters were drafted, the City, in partnership with the C4 and other community stakeholders, engaged with residents at community events, focus groups, and hosted seven community listening sessions (six of the seven located in NOFs) to receive input on the drafted strategies and actions. Free meals were provided at every event, with event in NOFs including childcare services and Visa gift cards for participants.

- **Transportation Event – February 15, 2024**
  Ottawa Hills High School
- **Commercial Building Event – June 7, 2024**
  GR Chamber of Commerce
- **Energy Event – June 18, 2024**
  Center for Community Transformation
- **Nature Based Solutions Event – July 9, 2024**
  LINC Up's Gallery Space
- **Food Systems Event – July 10, 2024**
  Center for Community Transformation
- **Residential Housing Event – August 7, 2024**
  Center for Community Transformation
- **Residential Housing Event in Spanish – September 19, 2024**
  Home Repair Services

Primarily attendees felt positively about the strategies and actions, and provided changes or additions they would like to see in the chapters. More information on event partners, engagement techniques and takeaways for each event can be found in Appendix B.

During the second round of engagement the City partnered with local consultant, Khamai Strategies, to support C4 and other community partners in community engagement efforts. In partnership with the C4, Khamai Strategies attended BIPOC focused community events, such as LINC Up's Rock the Block and Dunham St. Block Party, during the summer months to engage residents on the CAAP. Khamai Strategies also worked in collaboration with C4 and Matthews House Ministries to engage with the unhoused population in a focus group for feedback on the CAAP.

In October 2024, all key sector drafts were posted on the City's CAAP website with a survey available for public feedback. Participants selected a key sector of the CAAP to provide input on what they liked, disliked, and specific changes they would like to see included in that chapter.

Lastly, all Round 2 engagement feedback from events, listening sessions and survey results were taken into consideration and incorporated into the final draft plan in anticipation for Round 3 engagement.

Photo: Third Round CAAP Engagement Event hosted by C4.

Plan Development
Round 3: December 2024 – February 2025

The Round 3 CAAP engagement began in December 2024 with the release of the full draft of the Climate Action & Adaptation Plan and a feedback survey. The majority of participants said they were satisfied with the Climate Action & Adaptation Plan. If respondents were not satisfied, they were asked to provide any additional suggestions they had for the plan. Overall, the feedback received from the survey on the CAAP was constructive, providing appreciation for the plan and relaying technical language adjustments of the goals, strategies and actions.

The Final CAAP Feedback Event was held in partnership with the C4 at The Venue on February 6, 2025. The event featured free dinner from BIPOC caterer "The Candied Yam" free childcare, Spanish translation services, and provided gift cards to participants who turned in their feedback sheets. After a 15-minute introduction, attendees were encouraged to take their feedback sheets to the six stations that each represented a chapter in the CAAP. A subject matter expert facilitator was present for each chapter station to answer any questions participants may have had and to receive any verbal feedback provided. Overall, the feedback collected was positive and community members acknowledged the variety of strategies and intersectionality of the CAAP's scope of work. Each attendee was able to provide their input on each chapter of what they liked, disliked, and if they had any requested changes.

3 City Wards engaged

3 Rounds of Outreach

81 Climate Advisory Team Members

1,600+ Participants

Total Participation

The CAAP process engaged over 1,600 people. Total participation numbers reflect all three rounds of engagement through the CAAP process. However, the strategies and actions in the CAAP are also from the incorporation of CMP engagement and data.

CMP data was sourced specifically from the CMP's second round of engagement, which included over 1,800 participants and held workshops on the topics of:

- Land use planning for climate mitigation and adaptation
- Land use planning for environmental justice, health, and equity

The majority of those engaged (937) in the CAAP engagement process were during in-person events. While demographic data was requested at events with feedback sheets, often demographic data was not provided. However, by focusing on a targeted universalism approach, CAAP in-person events removed barriers to participation (compensation, childcare, food, etc.) and were intentionally located and marketed to residents in the neighborhoods of focus. Demographic data was collected from each round of the CAAP survey, but alone does not capture the authenticity of the planning process (as it captures only 41% of those engaged). Information about race, ethnicity, gender identity was collected for each online survey and ward information was collected only for Round 3 online survey.

A complete breakdown of the community engagement process and participation can be found in Appendix B of this plan.

Racial Equity Framework Overview

In an effort to dismantle systemic and institutional injustices that have been prevalent throughout our history, the City has made the conscious choice to highlight equity in each strategy of the City's Climate Action and Adaptation Plan (CAAP). The City's CAAP process recognizes that addressing climate change is impossible without racial equity. We realize that City infrastructure, policies, and investments have historically and systemically neglected and harmed Black, Indigenous and People of Color (BIPOC) and low-income communities. The City acknowledges these injustices and the need to right these wrongs by creating a culture of equity.

We recognize:

- BIPOC and low-income communities are the most impacted by extreme weather, and climate change will worsen existing harms and challenges.
- BIPOC and low-income communities must be prioritized to receive the benefits of the transition to a carbon-neutral society.
- If we design and implement programs to serve BIPOC and low-income communities, we will positively impact all residents in Grand Rapids.

CITY OF GRAND RAPIDS VALUES

Accountability
Equity
Collaboration
Innovation
Customer Service
Sustainability

Because of this, the City has focused the CAAP process on co-creation with community. The *Building Equity Process* from the Government Alliance on Race and Equity (GARE) was selected as a best practice to inform the Racial Equity Framework process. Climate Advisory Teams (CAT) or reviewers used the Equity Process Framework to create and revise strategies for the Climate Action and Adaptation Plan (CAAP).

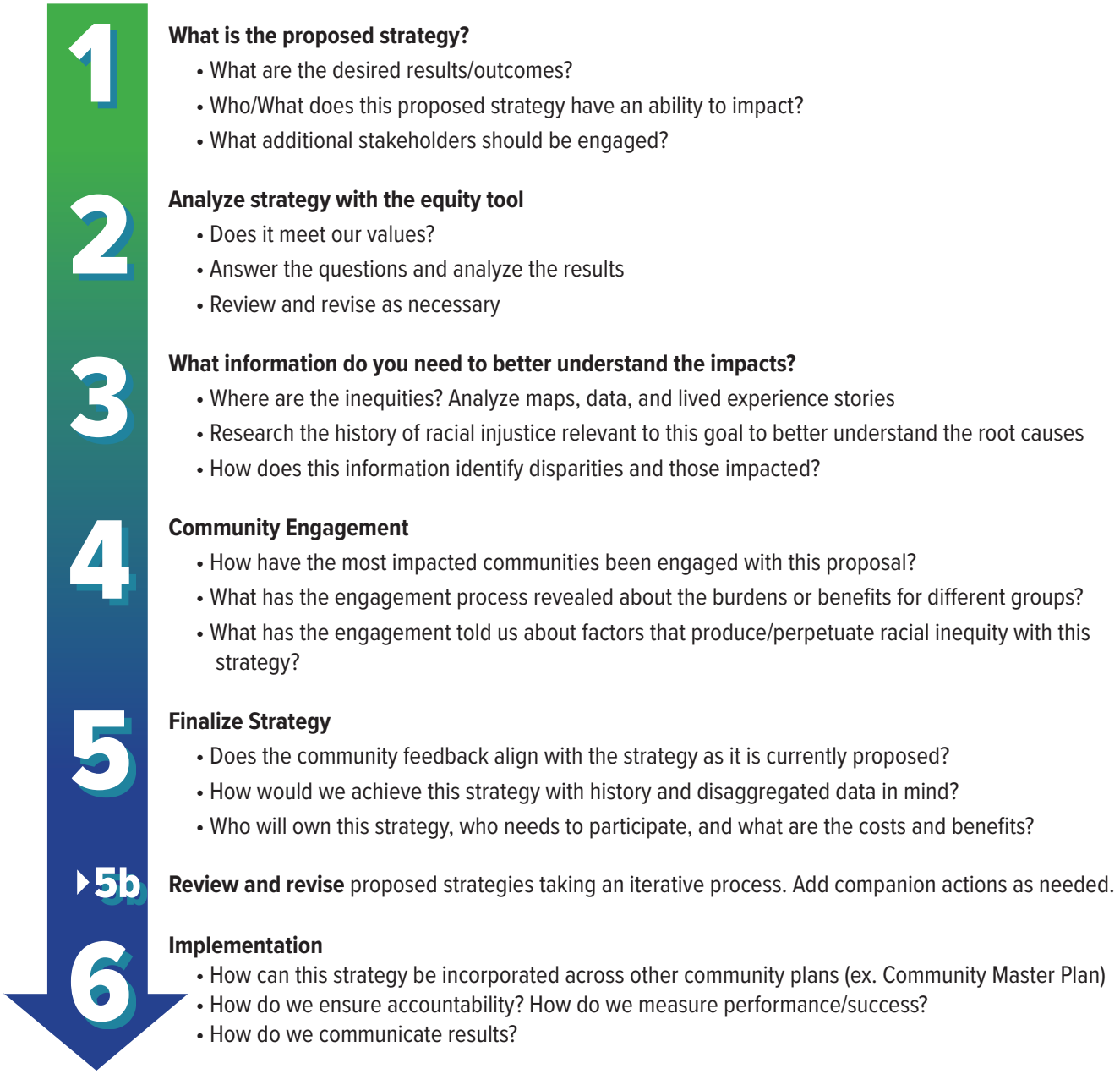


Figure 11: Six Steps for Building Racial Equity (adapted from GARE)

The Equity Toolkit from Austin (TX) Climate Equity Plan served as a best practice for the Racial Equity Tool and screening questions. Working with community advocates from the C4, the following subjects were selected to ensure the CAAP will increase racial equity: Health, Affordability, Accessibility, Just Transition, Community Capacity & Accountability.

1. **Health** – Strategy improves physical and mental health outcomes for low-income communities and communities of color. The strategy upholds the fundamental human right to clean, healthy and adequate air, water, land, food, education, transportation, safety, and housing.
2. **Affordability** – Strategy lowers and stabilizes costs related to basic living needs (housing, food, utilities, healthcare, transportation, etc.) for low-income communities and communities of color.
3. **Accessibility** – Strategy increases access to jobs, housing, transportation, funding, education, healthy foods, and a clean environment for low-income communities and communities of color. Strategy removes barriers through city infrastructure, policy, and investments.
4. **Just Transition** – Strategy ensures economic justice so that low-income communities and communities of color are prioritized in the benefits of the strategy and are protected from any potential negative consequences.
5. **Community Capacity** – Strategy elevates the voices of low-income communities, youth and communities of color by sharing power and cultivating leaders, skills, and resources that a community needs to survive, adapt, and thrive.
6. **Accountability** – Strategy ensures that low-income communities and communities of color can hold governments and institutions accountable for equitable implementation.

Table 2: Racial Equity Tool Questionnaire for Health Subject (adapted from Austin's Climate Equity Plan).

Subject 1: Health Strategy improves physical and mental health outcomes for low-income communities and communities of color. The strategy upholds the fundamental human right to clean, healthy and adequate air, water, land, food, education, transportation, safety, and housing.	Impact		
	Harm -1	Neutral or N/A	Benefit +1
Does the proposed strategy reduce air pollution (Ozone, VOC, NOx, etc.) and reduce asthma and other respiratory-related healthcare visits?			
Does the proposed strategy reduce extreme temperature exposure and healthcare visists for related illnesses (hyper/hypothermia, heat exhaustion, etc.)?			
Does the proposed strategy reduce stress, anxiety, and depression (i.e. improve mental health)?			
Does the proposed strategy help restore or protect ecosystem health (air, land, water, soil)?			
Does the proposed strategy encourage healthy local food systems?			
Overall response to these questions with justification:			

The Climate Advisory Teams or reviewers analyzed proposed strategies through the CAAP Racial Equity Tool and evaluated responses through scores that indicated if the proposed strategy would provide a positive impact (benefit), neutral, or negative impact (harm). If a strategy after discussion presented with any potential harm, the strategy was revised or eliminated.

The Racial Equity Tool was utilized in slightly different ways for each key sector of focus in the CAAP. Below is a breakdown of how each chapter was examined with the Racial Equity Tool by the CATs, or the Grand Rapids Office of Sustainability.

- **Energy Systems:** Sector strategies and actions created through 1:1s and focus groups with existing community partners. Racial Equity Framework and Tool worked through internally with Office of Sustainability staff.
- **Residential Homes:** The Residential Climate Advisory Team was comprised of a diverse group of housing advocates and community-based organizations, but due to timing the team was unable to review the strategies through the Racial Equity Tool. Racial Equity Framework and Tool worked through internally with Office of Sustainability staff.
- **Buildings & Industry:** Despite sending invitations to diverse participants, many of the BIPOC invitees had to decline to participate on the Commercial Building Climate Advisory Team (C-CAT) due to lack of capacity. Since the C-CAT lacked racial diversity, Office of Sustainability staff hosted two separate workshops with six paid local BIPOC Equity Consultants to review the draft Buildings & Industry sector strategies using the Racial Equity Tool.
- **Transportation:** Transportation Climate Advisory Team worked collectively together and in breakout groups to walk through each strategy proposed.
- **Nature Based Solutions:** Sector strategies and actions created through 1:1s and focus groups with existing community partners. Racial Equity Framework and Tool worked through internally with Office of Sustainability staff.
- **Food Systems:** Sector strategies and actions created through 1:1s and focus groups with existing community partners. Racial Equity Framework and Tool worked through internally with Office of Sustainability staff.

Plan Framework

Themes

- **Equity:** Leveraging City influence to intentionally remove and prevent barriers created by systemic and institutional injustice.
- **Economic Prosperity:** Increasing financial opportunities for both individuals and organizations in a just transition to a greener economy
- **Health:** Considering physical, mental, and emotional well-being as a significant indicator of quality of life
- **Resilience:** The ability of people, systems or community assets exposed to a hazard to resist, absorb, accommodate, adapt to, transform and recover from the hazards' impacts
- **Collaboration:** Working together in partnership with others; teamwork.

Key Sectors of Focus

- **Energy Systems**
  - o Addressing the generation, distribution and consumption of fossil fuel-based energy.
- **Residential Homes**
  - o Increasing the affordability, energy efficiency, health, climate resilience and access to renewable energy of housing.
- **Buildings & Industry**
  - o Reducing GHG emissions from buildings and industrial processes.
- **Transportation**
  - o Reducing reliance on fossil fuel powered single-occupancy vehicle usage, increasing active and shared modes of transportation, and increasing access to electric vehicles.
- **Nature Based Solutions**
  - o Increasing sequestration and increasing nature's resilience to climate change.
- **Food Systems**
  - o Reducing waste and increasing access to local food and growing opportunities.

VALUES

The value themes are woven throughout the plan key sectors of focus. Tagged actions indicate that recommended project, policy, or program directly advances that value theme.

Collaboration

Economic Prosperity

Resilience

Equity

Health

Measures of Success

Meet the community-wide science-based targets of:

- 62.8% per capita GHG reduction community-wide by 2030 from 2019 baseline emissions
- 100% per capita GHG reduction by 2050 from 2019 baseline emissions.

Internal Definitions

- **Community Goal:** Desired outcomes in specific sectors to achieve our community science-based targets and reduce the impacts of climate change.
- **Strategy:** Major initiatives, or services that must be completed in order to progress towards the goals.
- **Action:** The programs, activities, and projects that will push forward the strategies.

Key Sectors of Focus

Energy Systems

Community Goals

- **Goal: 80% electricity grid decarbonization by 2030**
- **Goal: Increase the reliability and resilience of energy systems.**

Climate Impact

In 2019, 97% of all Grand Rapids community-wide GHGs were generated from the generation, distribution and consumption of fossil fuel-based energy. Coal, crude oil, and natural gas are all considered fossil fuels because they were formed from the fossilized, buried remains of plants and animals that lived millions of years ago. Because of their origins, fossil fuels have a high carbon content. Coal has historically been burned in power plants for electricity and gasoline is a product of crude oil. Renewable energy, like solar and wind, generally produce zero GHG emissions.

Most energy emissions are attributed to how residents and organizations use energy (in buildings, homes, vehicles) and you can find more information on those emissions in other chapters. Only 3% of energy related GHG emissions are from the distribution of natural gas (methane leaks) and electricity (line losses). [1]

Our community's energy related GHG emissions are associated with the following types of energy: electricity 37%, natural gas 29%, gasoline 18%, diesel 7% and miscellaneous 9%. [1] GHG emissions are greatest from electricity because the majority of electricity in 2019 was produced by burning fossil fuels including coal and natural gas. As more renewable energy is constructed (e.g., solar, wind), GHG emissions associated with electricity will decrease and eventually be less than emissions generated by natural gas.

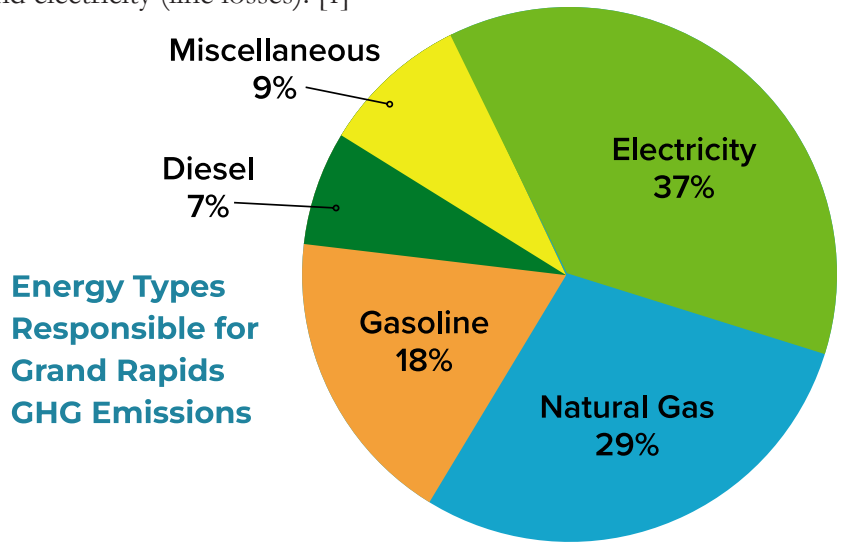


Figure 12: Energy Types Responsible for Grand Rapids' GHG Emissions

The largest predicted climate changes for Grand Rapids that will impact the energy sector are increases in temperature, extreme weather events and precipitation. Rising temperatures will increase the demand for air conditioning (electricity) and decrease heating needs (natural gas). Increased extreme weather events will cause more electricity power outages (damage to power lines) and likely increase the duration of the outage. Lastly, increased precipitation and drought will both impact humidification needs. [2]

Equity & Health Impact

Human life and business/organizational prosperity depend upon safe, reliable, clean and affordable energy. Energy keeps people warm/cool, powers food storage and cooking as well as appliances that support daily living, moves vehicles, generates lighting and safety systems, supports access to communication sources, powers the generation and delivery of goods and services, in addition to many other things. However, the generation and distribution of energy has had a disproportionate negative impact on vulnerable communities, including communities of color and low-income communities.

The burning of fossil fuels (coal, natural gas, and gasoline) generates toxic air pollution such as mercury, nitrous oxide and particulate matter, which significantly impact respiratory conditions, including asthma. In addition, burning natural gas on-site (in your home or other buildings) generates air pollution linked to increased asthma incidences and carbon monoxide poisoning.[17] Energy infrastructure serving vulnerable communities is typically less reliable, resulting in more frequent and longer-lasting power outages. Vulnerable communities are often faced with a "heat or eat" dilemma where people must choose between paying for food or heating. This dilemma contributes to higher utility shut-off rates. Finally, vulnerable communities have little to no access to renewable energy sources due to insufficient residential building structures (e.g., older roof structures, lack of appropriate electrical wiring), renting, and/or lack of ability to pay for renewable energy (upfront capital or subscription fees).

A Changing Climate

"It is affecting my bills. [They] are always in the $100 dollar range and more. I live in the 49507 zip code and I want my bills to reflect like anyone. I don't want to choose to feed my kids or pay my gas or electric bill."

– CAAP Survey Respondent, March 2023

What's Happening Now & Barriers

The State of Michigan is the primary entity authorized to regulate electricity and natural gas energy generation and distribution through laws enacted by the Michigan Legislature and regulations passed by the Michigan Public Service Commission (MPSC).

In November 2023, the Michigan Legislature passed The Clean Energy & Jobs Act (PA 233, PA 234) and The Clean Energy Future package (PA 235, PA 229, PA 230, PA 232) updating the energy laws previously passed in 2008. [18] This broad package of laws created many new requirements for the MPSC and energy utilities, including:

- Creates a statewide process to permit solar, wind and battery projects in the state.
- Amends the Michigan Zoning Enabling Act to subject zoning ordinances to PA229.

Lake Michigan Filtration Plant, Photo: City of Grand Rapids

- Requires utilities to generate 60% of their electricity from renewable sources and 80% from carbon-free sources by 2035 and 100% clean energy portfolio by 2040.
- Increase energy efficiency standards for energy utilities and specifically direct programs to include low-income and other underserved communities.
- Allows farmers to rent land to solar operations while maintaining preservation of farmland.
- Establishes the Community and Worker Economic Transition Office in the Department of Labor and Economic Development.

The effective dates of these laws vary and the MPSC is currently in the process of developing the required regulations.

Before the State passed new legislation, Consumers Energy and DTE Energy, the two energy utilities that provide the majority of electricity, natural gas to Grand Rapids, respectively, had their own voluntary emissions reduction and renewable energy goals.[19] The utilities may need to amend these goals based on the requirements in the 2023 energy laws. Currently their goals are:

- Consumers Energy: Net zero carbon emissions and meeting 90% of customers' energy needs through clean sources, including wind and solar by 2040
- DTE Energy: Net zero by 2050 for own operations and gas supply and 35% reduction in downstream or customer emissions by 2040

The MPSC requires that Consumers Energy submit an Integrated Resource Plan (IRP) at least every 5 years and this plan must detail how much electricity the utility

anticipates it will need to produce and how it will produce that electricity. Consumers Energy then requests the MPSC approve a rate to charge to customers via a regulatory rate case that will match the capital and operating costs of producing that electricity. It is important to note that, in Michigan, public utilities can only earn a profit for their shareholders from capital projects (building construction projects such as natural gas plants, solar arrays, wind farms). The City of Grand Rapids has participated in MPSC cases requesting increases in energy efficiency, renewable energy, distributed generation credits, authentic community engagement and reduction of fossil-fuel based electricity generation to meet climate goals. While the City was able to navigate the process, the MPSC regulatory processes and cases are complex, making it inaccessible for most residents and organizations.

Building and operating renewable energy projects are subject to state and local requirements, private market forces, federal incentives and electric utility interconnection processes. While the cost of renewable energy has dropped significantly over the last couple of decades and is now cheaper than building coal or natural gas plants, the availability of federal tax incentives may be impacted by the Trump administration. President Trump's declaration of a national energy emergency prioritizing oil and gas, as well as tariffs on building materials, have the potential to impact the renewable energy market. The City regulates the installation of renewable energy via the zoning ordinance and building permit processes. Property owners are able to install solar on their property under state law, however, there remains limited opportunity for solar energy access to people who cannot install solar panels on their own property because their roof is shaded, they lack suitable roof space, live in rented or multi-family properties or cannot afford the upfront costs to buy and install solar. For those who can afford solar, Consumer Energy's distributed generation rate and credit structure has made pursuing solar financially difficult. One current barrier to solar is that often times only electricity users that produce and consume 100% of solar generated electricity without sending energy back to the electricity grid (referred to as "behind-the-meter") have the opportunity for a large return on investment if they can finance the cost of installing the solar. The impacts of 2023's Public Act 235 to increase the distributed generation cap from 1% to 10% could be substantial. However, this impact will be dependent on MPSC decisions and needs to be assessed to determine how far the changes could increase financial opportunities to pursue solar.

Currently, only electric utilities can own and operate arrays in which subscribers can participate. Consumers Energy's Solar Gardens program requires participants to pay a premium (cost in addition to regular electricity costs). In the Solar Gardens program, the credit the participant receives for solar-generated electricity will not be larger than the cost to participate. In 2024, a community solar bill was pending in the MI Senate; the City of Grand Rapids participated in providing public comment in support of the bill. The bill would have enabled for the private development of community solar where residents, businesses and organizations own and financially

Community Solar

Community solar is an energy program that allows multiple individuals to share the benefits of a single solar energy system. This concept was developed to provide solar energy access to people who cannot install solar panels on their own property because they lack suitable roof space, live in rented or multi-family properties or cannot afford the upfront costs from a solar installation company. Participating in a community solar project allows individuals to access clean and renewable energy while receiving credits on their electricity bills.

Photo: WRRF Biodigester under construction

benefit from a portion of the solar array. At this time, the bills have not successfully passed.

Recent developments in battery storage technology increase the ability of solar generators to increase the amount of solar-produced electricity they can consume on their property. However, battery storage is often unaffordable. Another opportunity exists with developing microgrids, a smaller local electrical grid that can operate independently of the larger utility power grid in case of a power outage, but these can be difficult to pursue in Michigan due to outdated laws and regulations, cost, and a burdensome interconnection process to the grid. The age and location of existing infrastructure and the materials and life cycle of batteries and solar panels will be barriers in the future, as well as how to dispose of the materials responsibly.

It is also important to note that the City of Grand Rapids regulates the local steam district through the City Charter, which is currently owned and operated by Vicinity Energy. Currently, the steam district burns natural gas to produce heat for the district, which includes 122 buildings and the sidewalk snowmelt system throughout the downtown area.[20] Vicinity is transitioning a portion of their steam generation to electric boilers with desires for a complete transition. Vicinity is considering the funding and infrastructure pathway to source renewable energy for the electric boilers – creating an opportunity for zero emissions heating. Vicinity has a net zero carbon by 2050 goal across all of its operations.

As of 2025, the City produces enough renewable natural gas (RNG) from its biodigesters to potentially power most of the Water Resource Recovery Facility (WRRF) off the RNG power it generates and has the ability to expand with minor modifications. The City of Grand Rapids established a goal to supply 100% of municipal government operations with renewable electricity. To meet this goal, the City installed a nearly one megawatt behind-the-meter solar array at the Lake Michigan Filtration Plant, continues to operate a small rooftop solar array at the Oak Industrial office building and purchased renewable energy credits (RECs). The City continues to assess pathways to decrease reliance on RECs and to sustainably maintain 100 percent renewable energy, including pursuing solar on other City properties (e.g., Butterworth Landfill, fire station, City Hall, etc.) and participating in Consumers Energy's Renewable Energy Program.

Planning & Funding Considerations

One planning consideration is the potential increase of demand in electricity. Grand Rapids population is expected to grow in the coming decades, which will lead to an increase in demand. As the electrification of vehicles and building systems/appliances (air and water heating, stoves, fireplaces) increases, this will increase the amount of electricity that needs to be generated and distributed and will reduce the amount of natural gas needed. In order to meet demand, ***energy efficiency programs will be essential*** to meet community needs.

As our community adapts and builds more resilience to climate change, we are seeing an increase in on-site renewable energy generation (solar) as well as an increasing interest in battery storage. These will reduce the amount of electricity purchased from a utility and will also reduce GHG emissions associated with electricity consumption. Continuing to increase access to on-site renewable energy will be a priority.

The Biden administration, through Executive Orders and regulatory agency actions, leaned heavily into creating new programs for energy efficiency and clean energy development. The U.S. Congress also passed the Inflation Reduction Act (IRA), which authorized significant investments in the clean energy economy. President Trump has and is continuing to work to repeal and reverse clean energy programs and is shifting the federal government's focus to supporting the fossil fuel industry. The full impacts of this change in energy policy and funding opportunities remains uncertain at this time.

The state of Michigan has called for a clean energy economy in the newly released MI Healthy Climate Plan. However, at this time there is no dedicated organization focused on increasing access to career development in renewable energy, green entrepreneurism in Grand Rapids. Outside of the Urban Core Collective and Sierra Club, there are few other local organizations who focus on energy justice and intervene with the MPSC on utility cases. Increasing education and engagement around energy systems and how to be involved in the process will be crucial to the MPSC understanding the greatest needs of vulnerable residents and businesses.

MIHCP Climate Plan

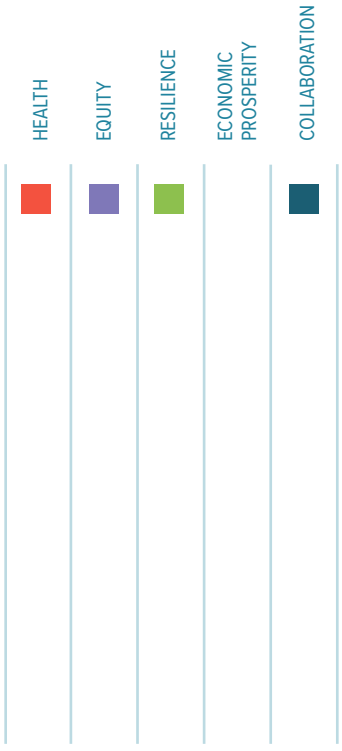
The achievement of the goals in this chapter will primarily be dependent on the leadership and accountability of utilities, regulators, and legislators. The complexity of future planning and investing to meet Grand Rapids' community-wide science-based targets are tied directly to utility outcomes. The City of Grand Rapids will continue to advocate with state legislators, regulators and utility partners and will pursue additional funding options (e.g., State of Michigan Solar for All, Climate Pollution Reduction Grant [CPRG] programs) to make emission reduction progress.

Desired Future Impact

The ideal future state of energy generation and distribution for the Grand Rapids community includes affordable, safe and reliable access to clean energy for all residents and employers. No energy accounts would be placed into shut-off status and the near-term focus of energy improvements would be on vulnerable communities, essential service providers and small employers.

In addition, Michigan would be an ideal location for anyone interested in the clean energy economy – providing employers and employees (including energy utilities) the opportunity to prosper. The clean energy economy would continue to grow in Michigan with a concerted emphasis on training and creating jobs for residents and new entrepreneurs, particularly those that have been left out of the energy economy.

The energy generation and distribution sector would achieve zero emissions ahead of 2040 with full support, including bill reduction/credit increase or wealth generation, for those that desire to install or procure their own zero emissions energy. In addition, resilient support systems, such as resilience hubs and microgrids would be up-and-running supporting community during and after emergencies. The health of residents would increase with less air pollution. Lastly, conservation efforts would be prominent in decision making increasing energy efficiency, life cycle planning for solar panels and batteries, and balancing our urban forest canopy with the utility system.



Strategy #1: Increase residents', businesses and organizations' access to and understanding of energy systems (electricity, natural gas, steam, waste to energy and renewable natural gas).

- **Action 1:** Identify existing education resources and organizations in community and create a single education platform on all energy systems.
  - o Map the community and identify which organizations have what existing resources available and who their intended audience(s) are.
  - o Determine who is best positioned to provide access to and education on energy systems, evaluating competencies such as trust, resources, capacity, network and existing energy systems experience and expertise.
  - o Create a single web site with information on all energy systems.
  - o Ensure the community understands the costs of energy generation and how they are paid for.
  - o Educate on current and emergent energy systems (e.g., Kent County's Waste-to-Energy, City's biodigester).

HEALTH	EQUITY	RESILIENCE	ECONOMIC PROSPERITY	COLLABORATION
	■	■	■	■
		■		■
				■

- o Ensure information sources and education on energy systems includes GHG emissions, emissions associated with electricity line losses and methane leaks from natural gas distribution, and clean versus renewable versus fossil fuel-based energy.
- o Ensure information sources and education on energy systems includes expected climate change impacts to energy systems, resilience opportunities, health (air pollution), equity, environmental justice and job opportunities.

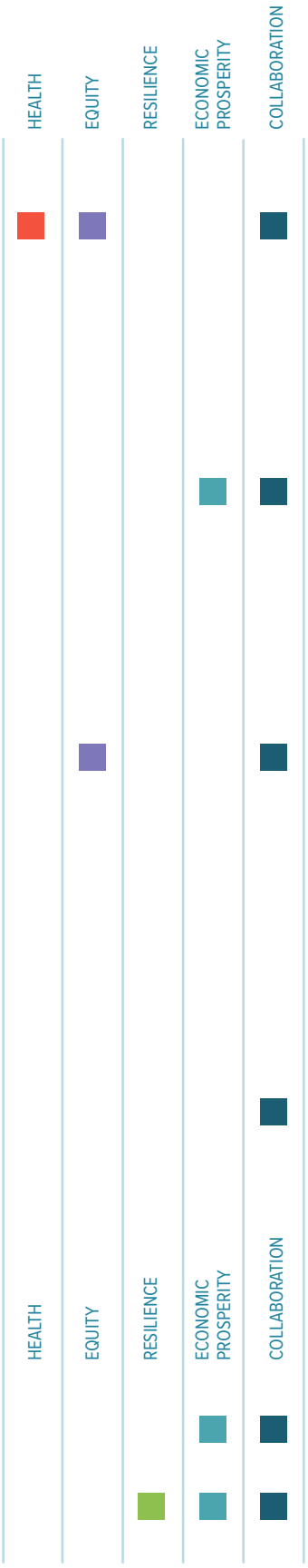
• **Action 2:** Partner with energy utilities serving the community (Consumers Energy, DTE Energy, Vicinity Energy) to enhance access to, as well as awareness and understanding of, their existing services, programs and compliance with renewable/clean energy and other climate related commitments, with a special emphasis on offerings designed to help vulnerable populations, small businesses/organizations and essential services.

- o Provide education on Consumers Energy IRP process.
- o Evaluate to the degree natural gas is responsibly sourced.
- o Educate and report on DTE Energy commitments for natural gas service.
- o Provide education on why large utility-scale renewable energy projects are needed in rural areas for utilities to meet renewable energy goals with local generation.

• **Action 3:** Educate the community on legal requirements for energy systems, with a special focus on the 2023 energy laws, and the process by which energy systems are regulated (predominantly through the MPSC).

- o Educate on the difference in net-metering and distributed generation and the 2016 law that switched from net metering to distributed generation.

• **Action 4:** Share the City of Grand Rapids' journey to achieve 100% municipal renewable energy, including methods for calculating historical, current and future total energy consumed, percent of renewable energy sourced, and emissions generated.



Strategy 2: Increase residents', businesses' and organizations' access to and participation in decision-making for energy systems.

- **Action 1:** Partner with the MPSC to share information on how interested parties can engage in MPSC's decision making processes, especially on new rules being created under the 2023 MI Energy Laws including the expansion of the MPSC's authority to consider climate change, equity and health when making decisions.
  - o Help residents engage on Consumers Energy IRP and Clean Energy Plan.
- **Action 2:** Continue to advocate for federal and state legislation that keeps the federal and state government at the forefront of sustainable and climate focused energy systems, including bills that support privately owned community solar arrays allowing individual or organizational ownership and wealth generating opportunities.
  - o Identify and coordinate partners to scale advocacy (ex. Chamber, Vicinity, County, businesses, residents).
- **Action 3:** Increase the community's participation in rule making, rate cases (affordable energy, distributed generation) and other MPSC decisions (ex. IRP, Voluntary Green Pricing (VGP), etc.).
  - o Continue City partnership with ELPC to participate and intervene in MPSC cases
  - o Lift up community focused groups for participation (ex. CUB, UCC, Sierra Club).
  - o Identify partners to scale advocacy (Chamber, Vicinity, County, businesses, residents, MGC).
- **Action 4:** Engage with Kent County and partner communities to evaluate the potential impacts of the requirements under Public Act 235 of the 2023 MI Energy Laws, which establishes clean energy standards and allows the County's Waste-to-Energy to operate until 2040.

Strategy 3: Decrease the cost of renewable energy and/or other innovative, low to no emission technologies.

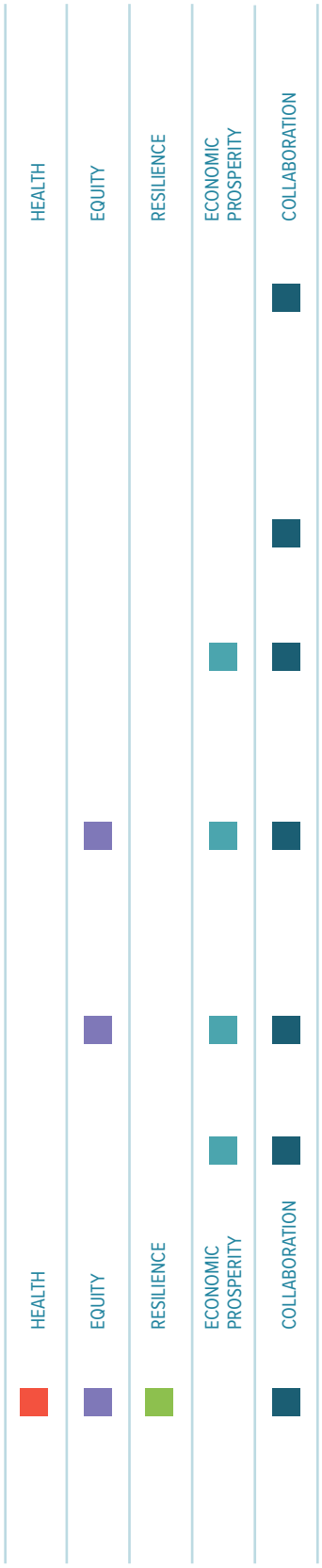
- **Action 1:** Earn and invest as much existing grant funding as possible (ex., Solar For All, Climate Pollution Reduction Grants, MPSC, etc.).
- **Action 2:** Support local parties interested in obtaining tax credits (ex. direct pay, EV or solar tax credits).

HEALTH | EQUITY | RESILIENCE | ECONOMIC PROSPERITY | COLLABORATION

- **Action 3:** Create a "solarize program" to educate on solar options, leverage solar tax credits and offer group-buy discounts to reduce the price of purchasing solar.
- **Action 4:** Leverage funding sources, including local green banks and on-bill financing, to expand access to low and no cost financing for on-site renewable energy and/or other low to no emissions energy technology (ex., combined heat and power, geothermal, etc.).
- **Action 5:** Partner with Vicinity Energy on creative approaches to offering affordable e-steam to Steam District customers.

Strategy 4: Support the installation of solar or other low or no emissions technology on-site.

- **Action 1:** Update the City's zoning ordinance to remove zoning barriers in all districts for on-site solar. [CMP 1.C]
- **Action 2:** Educate and provide renewable energy training for the City's Development Center staff to ensure streamlined processes for requesting and receiving permits necessary for solar.
    - o Re-evaluate SolarApp+.
- **Action 3:** Identify an organization / process where interested parties can receive support analyzing the technical opportunities and financial implications of installing on-site solar.
    - o Conduct updated solar analysis on City properties.
    - o Create an online resource that performs a quick evaluation of opportunities.
    - o Work with organizations to promote solar installers that have been vetted.
    - o Increase awareness, understanding and speed of Consumers Energy's interconnection process in support of on-site solar installations.
- **Action 4:** Continue City's commitment to and achievement of 100% renewable energy for municipal operations with an emphasis on installing as much on-site solar as possible.
- **Action 5:** Work with industry professionals to increase understanding and awareness of other innovative, low to no emissions technologies located on-site at a property, including thermal systems, geothermal, and green hydrogen.
- **Action 6:** Maximize local benefit of the City's renewable energy portfolio through renewable natural gas generation at the City's biodigester and pursuing solar at the City-owned Butterworth Landfill.



- **Action 7:** Create a process to measure, track and report on the performance of on-site solar installations (size of array, electricity produced, consumed and placed back onto the grid, cost and cost savings).

Strategy 5: Support the purchase of renewable and carbon-free energy, with an emphasis on locally generated energy.

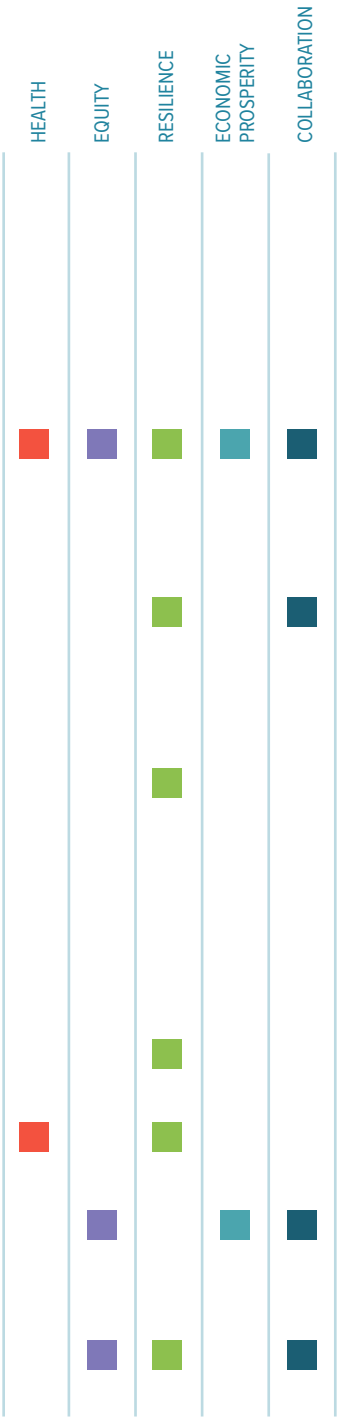
- **Action 1:** Ensure residents, businesses and organizations are aware of opportunities to purchase renewable or carbon-free energy from utilities (ex. Consumer's Energy's Voluntary Green Pricing program, DTE Energy's Natural Gas Balance).
    - o Ensure VGP projects are competitively bid and the kind of projects intended.
- **Action 2:** Educate interested parties on opportunities to purchase renewable energy credits or carbon offsets as well as other renewable energy contracting options like virtual power purchase agreements (vPPA).
- **Action 3:** Participate in statewide discussions to expand renewable energy markets in Michigan.

Strategy 6: Nurture a clean energy economy.

- **Action 1:** Work collaboratively with stakeholders, such as trade unions, schools, universities, community-based organizations and utilities to form a Green Career Task Force to pair career development and contractor training programs with training curriculums on green technology and trades with a focus on serving vulnerable communities.
- **Action 2:** Facilitate the development of redevelopment-ready sites for new renewable energy industries (e.g. utility infrastructure) to locate or relocate to Grand Rapids. [CMP 3.A.1]
- **Action 3:** Research, identify and coordinate discussions between local energy generators (ex. excess heat, heated water) and large energy users for potential synergies.

Strategy 7: Improve the resilience of the energy system.

- Action 1: Encourage utility-scale energy providers to plan for and implement system upgrades to prepare for an increase in electricity demand from electric vehicles, the electrification of buildings and processes, increased air conditioning needs with rising temperatures, more extreme heat events, and more power outages from extreme weather events.



- Engage on how DTE / community repurpose natural gas infrastructure and ensure just transition.
- Evaluate and address risks with only one energy provider that may experience disruption in service (all electric properties & power outage).
- Advocate for burying electricity infrastructure where significant hazards may exist.
- Review MPSC audit of distribution systems and recommendations for electricity plans.

- **Action 2:** Partner with utilities and community-serving institutions to raise awareness on and create new programs to address their own storm readiness and the local impacts of power outages, especially to vulnerable communities and small businesses.
- **Action 3:** Partner with local utilities to reduce tree and utility line conflicts above and below ground (ex. Tree Line USA Standards for urban forest utility tree pruning and maintenance, Utility Arborist Association best management practices).
- **Action 4:** Increase battery storage as well as awareness and understanding of how battery storage can increase resilience to power outages and expanding access.
  - Pursue aggregated distributed generation and storage.
  - Research vehicle to grid (V2G) opportunities where vehicle batteries serve as storage for other energy uses.
- **Action 5:** Evaluate opportunities to pilot microgrids and islanding capabilities.
- **Action 6:** Provide best in class emergency preparedness, response and recovery services associated with climate change hazards.
- **Action 7:** Increase the number of local residents, businesses and organizations applying for and receiving financial support due to power outages.
- **Action 8:** Identify and support active community hubs to transition to resilience hubs prioritizing NOFs.

Residential Homes

Community Goals

Goal: 5% of all existing residential buildings reduce energy 20% by 2030

Goal: All new residential buildings and 1% of existing buildings will meet IECC 2018

Goal: All new residential buildings and 11% of existing buildings are electrified per year until 2030

Goal: Improve the health and resilience of housing to the impacts of climate change.

Climate Impact

A home's materials, size, design, and construction affect the degree to which it contributes to climate change, exposes its occupants to climate-change-related hazards and financial risks, and protects its residents from such hazards.

The 2019 GHG emissions inventory showed residential energy use in Grand Rapids makes up 27.8% of total community-wide GHG emissions including both single-family and multi-family residential housing. This chapter will focus on single-family residential housing which in this plan includes residential buildings that have 4 units or less. However, it's worth noting that the building code and the City's Planning Department define multi-family housing as 3 or more units. GHG emissions in single-family residential homes are primarily from energy used within the home on electricity, cooking, heating, and cooling. However, various building designs and materials can make homes more or less energy efficient, and, by extension, generate more or less greenhouse gas emissions.

A Changing Climate

"The changing climate creates a lot of uncertainty about safety. The recent unpredictable storms, unsafe air, heatwaves wildfires, flooding, long winters, and other hazards are all shaping how I move through the world."

– CAAP Survey Respondent, October 2023

While there is currently no data available on the proportion of Grand Rapids homes that have air conditioning (AC), anecdotally, many homes (particularly older homes and low-income households) in the City either lack it completely or may not have enough cooling if residents rely on fans or window AC units. AC might be used sparingly to save money on electric bills. These conditions could expose residents to dangerous conditions during hot weather. Heavy rainfall and flooding, including basement flooding, could damage residential property. Increased heavy rainfall and flooding could increase the price of insurance for residents and businesses.

Equity & Health Impact

Grand Rapids has an older housing stock, which can add character, but also presents challenges. Over 60% of homes in Grand Rapids were built before 1960, with many being built in the early 1900s [29]. The quality of the existing housing stock varies across neighborhoods. Substandard conditions and environmental exposures are known issues in housing stock in the Neighborhoods of Focus (NOF). This combination of factors increases sensitivity, as substandard housing is more likely to be damaged by hazards like convective storms and flooding. Residents experiencing housing burden, when over 30% of income is spent on rent/mortgage and utilities, are less able to afford improvements and maintenance that reduce risk. Older homes within NOF often lack air conditioning, have limited access to green space that mirrors historic redlining, and are more likely to experience urban heat island effect due to increased impervious surfaces.

The *urban heat island* effect is an increase in temperature caused by the built environment of paved surfaces and closely packed buildings that amplify and trap heat.

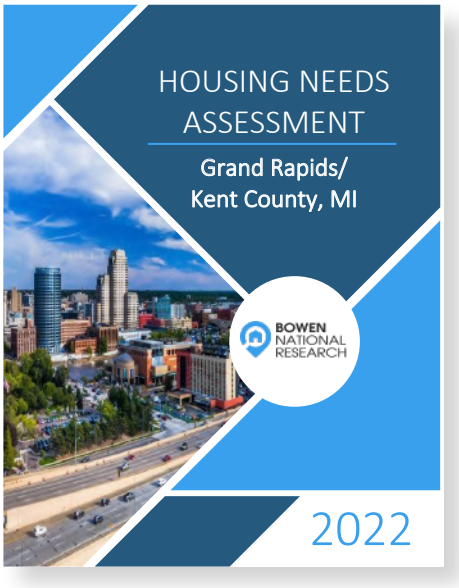
Low-income and Black, Indigenous, and People of Color (BIPOC) are most vulnerable to the impacts of climate change in Grand Rapids from being more likely to live in less resilient housing. Living in older housing that lacks insulation and air conditioning leaves residents more vulnerable to extreme temperatures which can lead to health impacts ranging from difficulty sleeping to heat exhaustion. Asthma and allergies can be triggered by homes being less resistant to water intrusion, pollution, and extreme temperatures. Combustion byproducts from gas appliances have been linked to asthma, and most homes do not have proper gas stove ventilation. Mental health is impacted from being concerned about costs, experiencing direct harm from physical health impacts, and worrying about the home providing inadequate shelter. These health impacts lead to additional healthcare costs and less money for other needs related to health and well-being which furthers disparities in terms of health and wealth. Residents may be unaware of existing resources or lack capacity to apply for assistance programs. Also, while residents are beginning to see the impacts of climate change, they might not yet recognize health impacts connected to climate change such as heat exhaustion or know how best to prepare for more temperature extremes, precipitation, and severe weather events.

In 2008, Michigan legislators repealed access to choice of electricity providers to a cap of 10% of retail electricity customers in Michigan and gave two regulated public utilities — DTE and Consumers Energy — a monopoly over 90% of the

retail electricity market in the Lower Peninsula. The lack of choice in the market can contribute to higher electricity rates and energy burden for low-income populations. High energy burden, the percentage of gross household income spent on energy costs, is another cause of vulnerability to impacts of climate change. Without proper insulation in many homes, the cost of energy is higher. Some residents may resist using heat or air conditioning to save money which could increase health risks. As electricity is more expensive than gas, transitioning away from fossil fuel use becomes more challenging without increasing operating costs.

What's Happening Now & Barriers

Housing is a high-priority concern for Grand Rapids residents. The City needs more housing as well as better options in terms of quality, density, proximity to jobs and amenities, and affordability. Population trends and projections in the City's 2022 Housing Needs Assessment show the housing gap in Grand Rapids is growing. The report estimates a growing housing gap of 7,951 rental units (a 48.9% increase since 2020) and 6,155 for-sale units (a 73.5% increase since 2020) over the 2022-2027 period. [21] Housing agencies have limited capacity with affordable housing already scarce and subject to waitlists, which perpetuates housing burden for low-income households. [21] In rental situations, tenants may fear making complaints about housing conditions (mold, lead, pests, etc.) because of not wanting to experience a retaliatory eviction, or they are hesitant to leave unsafe conditions because of the difficulty in finding other affordable housing. The rising cost of housing creates a challenge for residents to afford energy efficiency updates or electrification costs or to go all-electric without increasing operating costs.



Building energy codes are set at the state level, and municipalities are not able to require stricter energy standards by law. Michigan Energy Codes are adopted based on the International Energy Conservation Code (IECC), a publication for energy-efficient residential and commercial building construction. The City of Grand Rapids cannot require upgrades to existing buildings but can only enforce standard property maintenance, which grandfathers older and lower building standards. For example, City of Grand Rapids cannot require property owners to install more insulation in rentals because that would be beyond the requirements of the code in effect at the time the property was constructed.

There is also a lack of contractors in the community which bottlenecks the capacity of local home repair and weatherization programs. Contractor training often does not incorporate energy efficiency. Combined with a misperception of electric equipment (ex. heat pumps) performing poorly in a winter climate, often contractors do not have the experience to provide guidance on installing electrification measures in homes. With so many houses being built before lead-based paint was banned in 1978, many

need toxic lead hazards addressed when urgent repairs and efficiency upgrades are being done, especially if painted surfaces are going to be disturbed. The process of mitigating and/or abating lead hazards can be very costly and may send projects over budget, which can limit what types of upgrades home repair resources are spent on. There is also a lack of contractors certified in lead renovation and repair. However, with sufficient resources, addressing energy efficiency repairs in homes can also be an opportunity to address health hazards such as lead at the same time.

In 2025, the City amended the zoning ordinance to allow for solar-by-right on the street facing side of a building, regardless of it is south facing. The City still requires an administrative departure (exception) be submitted, paid for and approved for any solar installation on the street facing side of a building if it is not south facing.

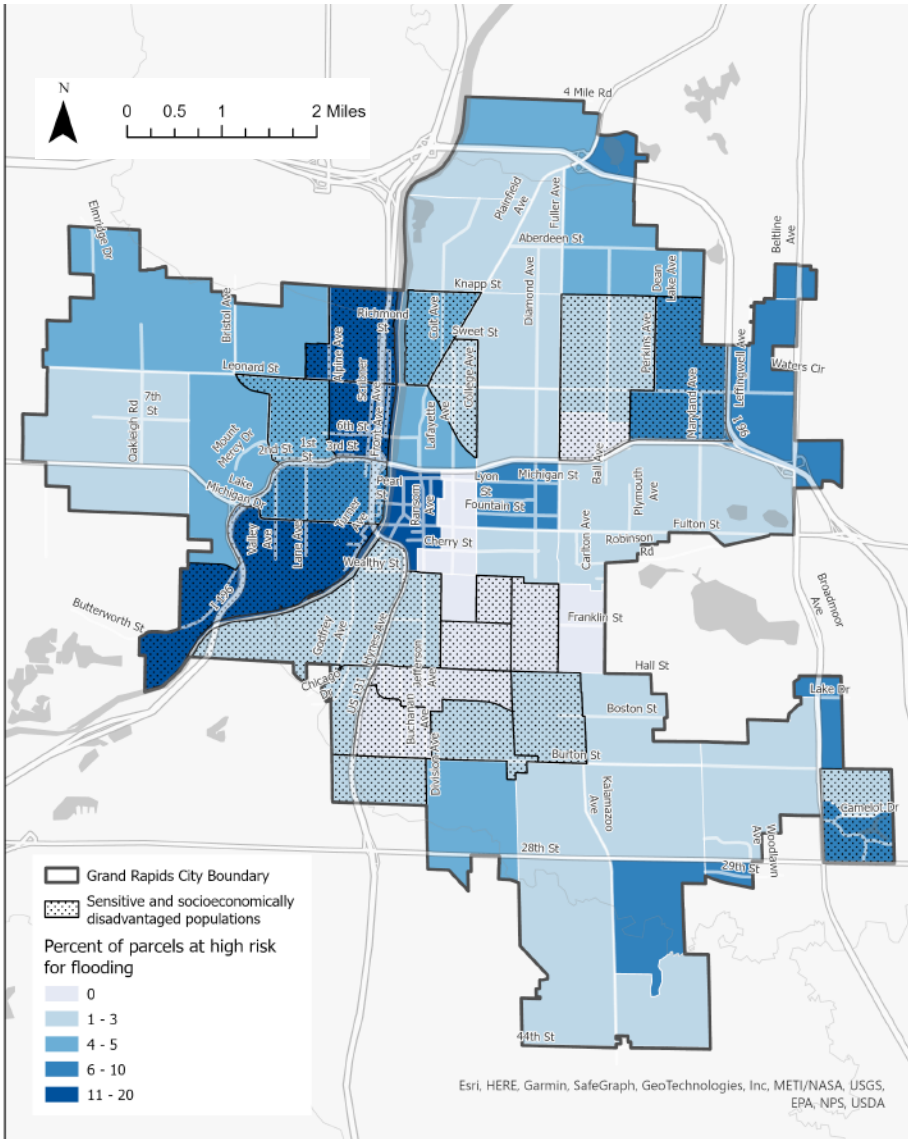


Figure 13: Parcel-based, climate change adjusted flood risk by census tract, 2023-2053 [37]. The darker blue the census tract, the greater percentage of its parcels have a "severe" or "extreme" risk of flooding on Flood Factor. Note: tracts where few or no parcels designated as severe risk for flooding may still have many parcels with low or moderate risk of flooding. Dots indicate a census tract is in the 75th percentile for vulnerability. Map was created by ICLEI staff.

Lastly, a key barrier faced in addressing GHG reduction in housing is about changing human behavior. Mindsets that have contributed include a historically heavy reliance on gas, leaning into convenience, and saving money. Lack of public education and awareness about the impacts of climate change and how to address them are also a challenge. For example, some homes are located within a floodplain, but many residents lack flood insurance on homes as it is an extra expense that they might not be able to afford if they are even aware of it. Despite these challenges, the City is working to address reducing GHG emissions in the single-family residential sector.

The City of Grand Rapids, Michigan Green Building Collaborative (formerly the U.S. Green Building Council of West Michigan) and Urban Core Collective launched the Equitable, Healthy & Zero Carbon Buildings (E.H.Zero) Initiative to co-create with community programs and policies that reduce carbon emissions from residential and commercial buildings. E.H.Zero's home renovation pilot program is a local model to explore how best to braid resources to update existing homes in the NOFs to be as efficient as possible. The City's new Community Master Plan also focuses on increasing affordability and housing stock – these themes are incorporated into this chapter to reflect community's needs. However, land use density is addressed in the Transportation chapter.

Planning & Funding Considerations

Challenges to reducing GHG emissions from residential homes and addressing the vulnerability of low-income and BIPOC residents to climate change impacts include identifying sustainable funding mechanisms, centering customer service in program design and management, and investing in climate resilience measures for homes.

Despite uncertainty in the federal landscape, the City will continue to seek funding opportunities for upgrades for residential homes, such as grant programs from the state (e.g., Solar for All, CPRG). However, continuing conversations to lean into alternative financing options with partners that are outside of grants would help to establish program sustainability. One example is on-bill financing, a best practice from other utilities within the state offering property owners the ability to pay for energy efficiency or renewable energy improvements through low-to-zero interest rates, simple contract structures, and a streamlined repayment mechanisms on their monthly utility bill. This option is especially helpful for those who may not qualify for traditional financing and struggle with limited access to upfront capital. [22]

Stakeholders have made clear that the community needs support with understanding how to be resilient against climate change. Creating navigator programs that focus on education and creating a resource hub that includes staff to guide residents through all aspects of energy audits, financing, and the construction process could increase the likelihood of community participation towards reducing carbon emissions from homes while strengthening resilience to the impacts of climate change.

In 2023, the cost of natural disasters in the U.S. exceeded $92.9 billion, including 28 weather events causing over $1 billion in damage each. With billion-dollar disasters now the norm, communities must take action to mitigate the impact of these catastrophes.[23]

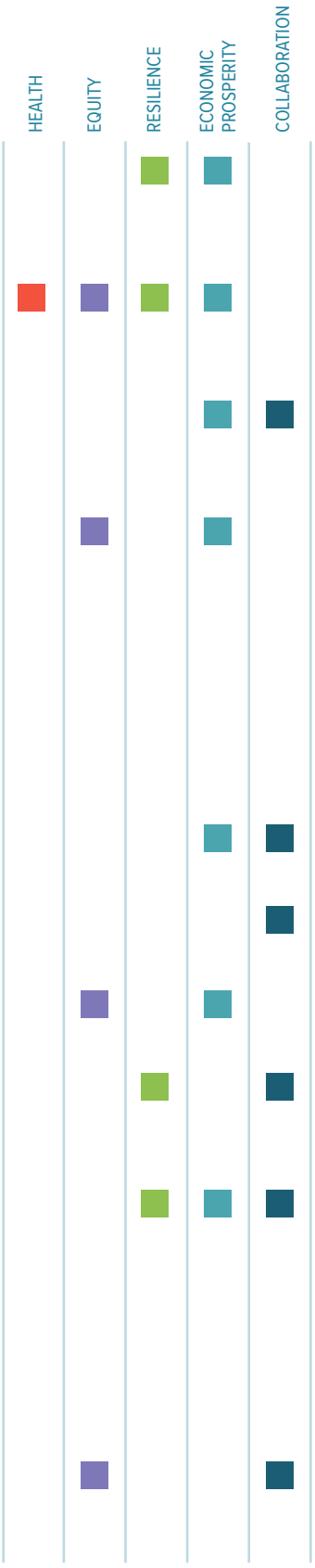
The U.S. Chamber of Commerce 2024 Climate Resiliency Report identified that every $1 invested in natural disaster resilience and preparedness, communities can save $13 in damages, cleanup costs, and long-term economic impact.

Working to improve the resilience of Grand Rapids housing stock could help save both residents and the City costly recovery expenses.

The City should also consider the potential impacts of climate-related migration, which refers to the movement of people influenced by climate change, in housing discussions and planning efforts. News stories have identified midwestern cities, including Grand Rapids, as places that are comparatively more affordable and safer from hazards than coastal and western population centers. A large influx of new residents in Grand Rapids could exacerbate inequities, increase displacement of residents, and strain local resources. However, it is important to note the many uncertainties related to migration flows; climate change is only one of many factors people consider when deciding where to live. The majority of U.S. moves are within the same county, and data currently shows large growth in population in states with significant climate risk, including California, Texas, and Florida, over relatively safer climate options like Michigan. [14] Although, existing migration flows may change as climate change worsens in the coming decades, making it essential that communities, cities, states, and the federal government prepare.

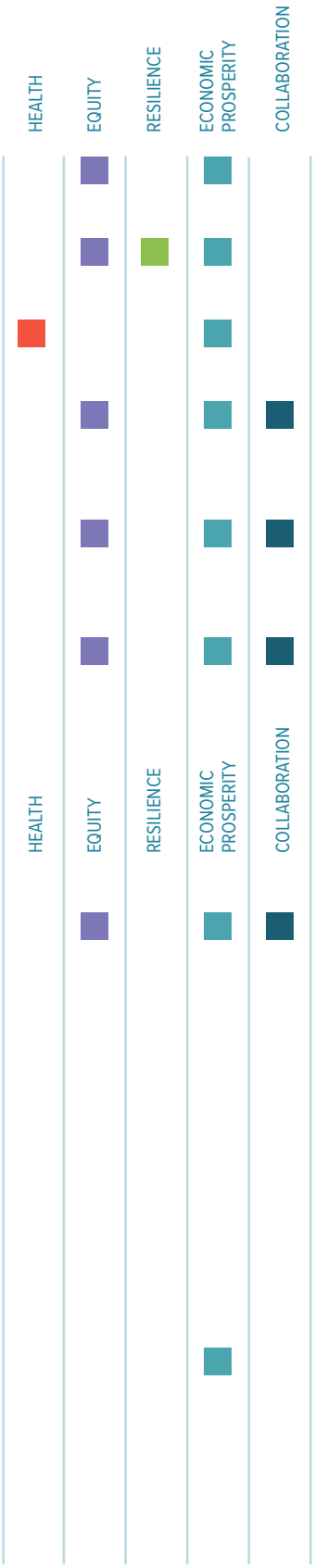
Desired Future Impact

If we can adequately protect our most vulnerable residents from the impacts of climate change, we can hope to see all residents living in healthy, climate resilient homes. To reach this desired impact, government would embrace a health-in-all-policies approach and work with community to streamline repairs and energy upgrades. Homes would be well insulated, weatherized, and efficient as contractors certified in green building practices would be widely available and offer services at competitive prices. Lastly, utilities would work with community to increase access to affordable clean, renewable energy.



Strategy 1: Increase energy efficiency of housing.

- **Action 1:** Pursue funding to increase local capacity to provide weatherization and energy efficiency upgrades. [CMP 1.C.7]
    - o Include funding for pre-weatherization work (ex. roof repair).
- **Action 2:** Continue and expand the E.H.Zero home renovation pilot program which seeks to create a local model of how best to braid resources to update existing homes to be as energy efficient as possible. [CMP 1.C.7]
- **Action 3:** Partner with utility partners to increase resident access to energy efficiency services and efficient appliances, such as through rebate programs. [CMP 1.C.7]
- **Action 4:** Assess the feasibility of a truth-in-sale/-lease policy that shows potential buyers and tenants how efficient a house is by disclosing 12 months of utility data or having an energy score. [CMP 1.C]
- **Action 5:** Advocate for state and local adoption of the most efficient version of the International Energy Conservation Code (IECC) available and consider incorporation of additional climate mitigating solutions such as electric vehicle charging, energy storage, renewable energy, and building decarbonization. [CMP 1.C]
- **Action 6:** Incentivize housing developers to build beyond energy code requirements. [CMP 1.C]
- **Action 7:** Collaborate with utilities to improve access to residential utility data.
- **Action 8**: Create incentives for rental property owners to improve energy efficiency of homes while preventing displacement of tenants. [CMP 1.C]
- **Action 9:** Educate on climate resilient green building design practices that increase energy efficiency (e.g. insulation, window overhangs, etc.). [CMP 1.C.7]
- **Action 10:** Increase awareness and understanding of embodied carbon and low-impact construction principles that emphasize the importance of prioritizing materials that include reused or recycled content (especially concrete), the reuse of an existing house (at least the foundation and core structural elements), and deconstruction versus demolition.
    - o Encourage the use of low impact building materials and construction practices when feasible such as through creating incentives.
- **Action 11:** Engage with community to continue identifying barriers and seeking solutions to implement energy efficiency measures (i.e. costs, zoning, historic preservation requirements).

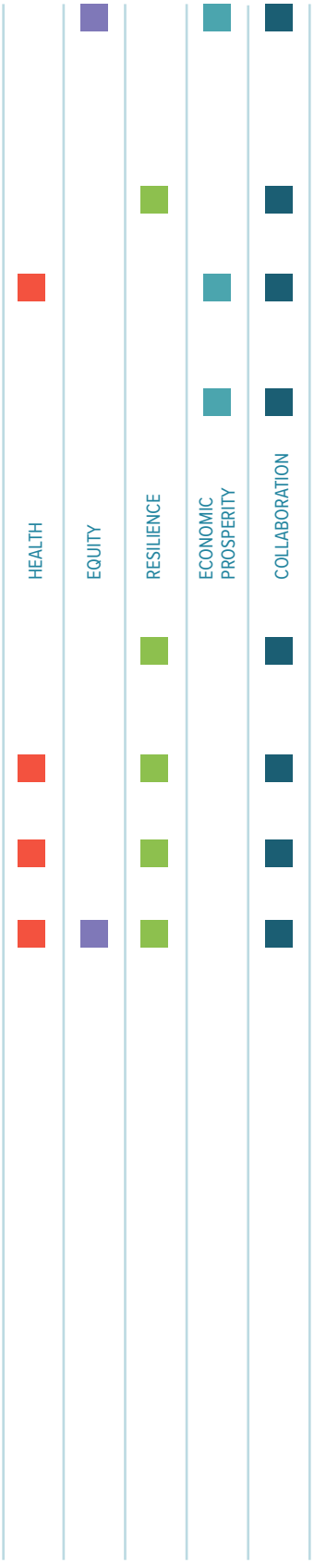


Strategy 2: Support the transition to clean energy use in housing.

- **Action 1:** Pursue funding for solar energy on homes, prioritizing resources for low-income homes. [CMP 1.C.11]
- **Action 2:** Pursue funding to improve roof conditions of homes to prepare for on-site solar. [CMP 1.C.11]
- **Action 3:** Incentivize housing developers to build housing all-electric or all-electric ready. [CMP 1.C]
- **Action 4:** Advocate for affordable electricity rates at the state level, such as by income and/or special rates for households using heat pumps to reduce energy burden. [CMP 1.C]
- **Action 5:** Identify and promote education and resources to help residents access efficient, cost-effective electric appliances (ex. heat pumps). [CMP 1.C.7]
- **Action 6:** Engage with community to continue identifying barriers and seeking solutions to installing roof-top solar (ex. cost, zoning, historic preservation requirements).

Strategy 3: Increase community capacity for, awareness of, and access to home improvement resources.

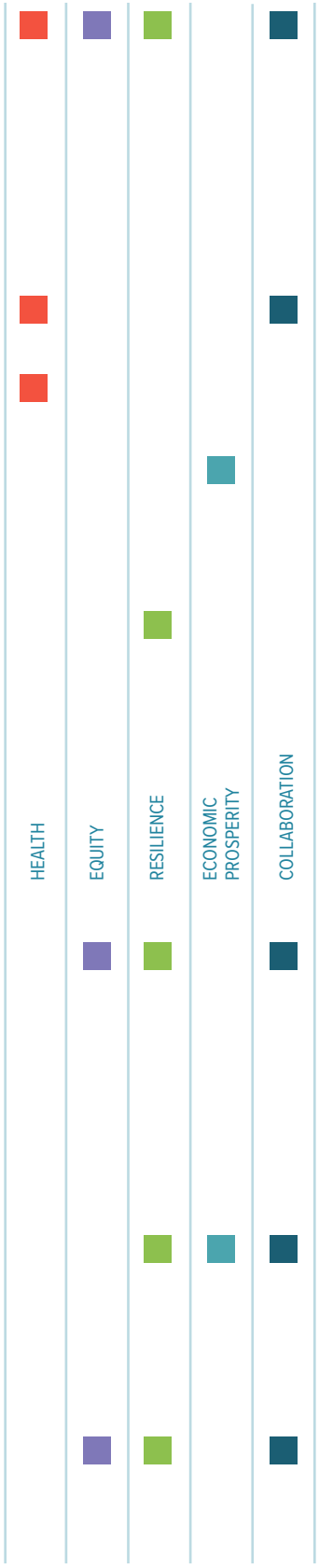
- **Action 1:** Create a wrap around, "Whole Homes" approach to streamline housing services to residents including: [CMP 1.C.7]
  - o Create a single application/point of contact.
  - o Identify how best to stack and braid available resources.
  - o Establish funding for designated staff to help residents navigate and access resources and financing opportunities.
  - o Create materials accessible in different languages.
  - o Prioritize those most in need for funding assistance.
  - o Partner with multiple organizations to connect those working on separate but related issues.
- **Action 2:** Create on online resource hub to help residents find housing related resources such as local contractors, coaching services, programs related to housing, and information on their rights. [CMP 1.C.7]
  - o Document and publish local housing case studies that show cost savings, energy savings, carbon reduction, best practices, and lessons learned.



- **Action 3:** Explore the feasibility of innovative financing solutions like creating a green revolving fund, green cost share program, buy-down options, on-bill financing, or other programs that help residents finance home energy updates while investing in serving additional households. [CMP 1.C.7]
- **Action 4:** Continue to raise awareness and share best practices with the community to decarbonize housing. [CMP 1.C.7]
- **Action 5:** Expand partnerships across the financing, education and healthcare sectors to support decarbonization of homes and identify health and affordability outcomes. [CMP 1.C.7]
- **Action 6:** Support training, certification, and career development for weatherization and green contractors. [CMP 3.C.2]

Strategy 4: Improve resident access to information and resources to make their homes healthy and climate resilient.

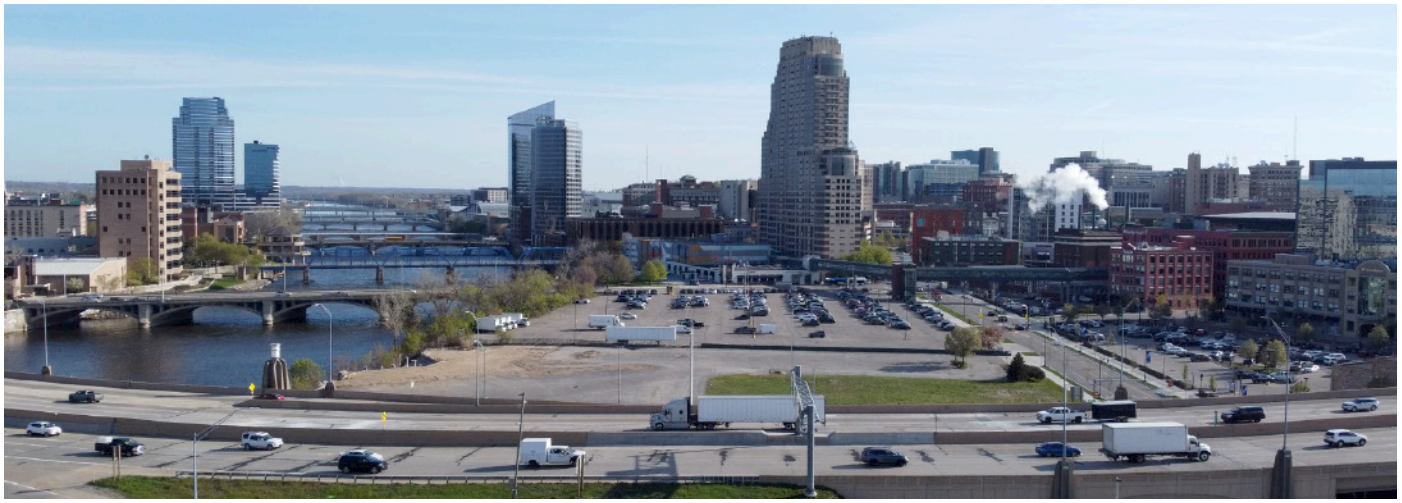
- **Action 1:** Establish a local metric to measure investments in climate resilience in frontline communities that is at least equivalent to the Justice 40 Initiative (e.g., 40% investment of resources in frontline communities).
- **Action 2:** Increase resident access to stormwater management measures for their homes (such as gutters, downspouts, etc.) to help prevent flooding.
- **Action 3:** Raise awareness about flood insurance for homes and educate residents on what to look for in policies.
- **Action 4:** Raise awareness of how households can prepare for extreme weather (e.g., extreme heat, flooding, severe storms) such as by:
    - o Improve communication and education on the impacts of climate change and the hazards it creates such as heat, flooding, drought and extreme weather events.
    - o Host workshops on emergency preparedness.
    - o Provide emergency kits and/or information on how to create one for a household.
    - o Educate on strategies to keep homes cool (e.g., insulation, fans, curtains, etc.).
    - o Increase the amount of and education about cooling centers.
    - o Engage community to create a Heat Action Plan.
    - o Educate on strategies to prevent water entry and flooding (e.g., raising HVACs, clearing storm drains).
    - o Increase knowledge of and access to homeless and emergency evacuation centers for extreme weather events and flooding.



- **Action 5:** Increase access to air conditioning (AC) for low-income residents living in older homes.
  - o Prioritize installation of electric heat pump or high SEER AC where feasible in terms of operation cost for the resident. [CMP 1.C.7]
  - o Explore partnerships with healthcare organizations to increase access to AC for residents with health conditions impacted by heat and humidity.
- **Action 6:** Promote healthy indoor air by educating on the benefits of switching to electric appliances, especially from gas stoves.
- **Action 7:** Encourage home repair programs to address lead and other environmental health hazards while addressing repairs and energy upgrades.
- **Action 8:** Reduce internal water leak risks and associated higher water bills by encouraging programs that replace older and higher water consuming piping, fixtures and appliances (toilets, etc.) with Plumbing Code approved materials and products to conserve water. [CMP 1.C.7]
- **Action 9:** Promote the utilization of resilient, sustainable, durable building materials that will age well in the local climate.

Strategy 5: Expand the amount and variety of housing types across all price points to address the rental and for-sale housing gaps in Grand Rapids, which could be exacerbated by potential climate migration. [CMP 1.B]

- **Action 1:** Support programs that expand housing diversity based on income and housing types. [CMP 1.B.1]
  - o Coordinate programs to encourage more mixed-income projects.
  - o Build creative incentive tools and programs to promote a variety of housing choices.
  - o Partner with development community to identify the most impactful tools and current barriers.
- **Action 2:** Assess and reduce barriers to innovative housing solutions (e.g., modular construction, tiny homes, prefabricated materials, and new building methods). [CMP 1.B.4]
  - o Encourage manufacturers to meet with the City's Planning Department to discuss design standards at the front-end of a project.
- **Action 3:** Explore tools and strategies for protecting residents at risk of displacement. [CMP 1.A.5]
  - o Support and coordinate holding land in reserve for affordable housing via community land trusts or land banks.



Buildings and Industry

Community Goals

Goal: 10% of all existing commercial buildings reduce energy 20% per year until 2030

Goal: 5% of existing commercial buildings are electrified per year until 2030

Goal: Reduce GHG emissions from industrial processes (further analysis required to establish target)

Climate Impact

In 2019, 38.5% of all community-wide GHGs were generated from buildings that consumed electricity, natural gas, and/or steam – this sector accounts for the largest single-source of GHG emissions in Grand Rapids. Within this sector, residential buildings, including both small and multi-family buildings, accounted for 28% while commercial buildings generated 11%. The on-site burning of natural gas created 59% of the commercial building emissions.

Industrial processes contributed an additional 25.1% to community-wide GHG total in 2019 and represent the third largest source of emissions. The consumption of electricity accounts for 72% of the emissions from industry. [1]

For purposes of this chapter, buildings include all building types from commercial office space to health care facilities to industrial warehouses to academic buildings to multi-family residential buildings, which are defined within this plan as residential buildings that have more than 4 units (ex. apartment buildings, condominiums, Section 8 housing, etc.). However, it's worth noting that the building code and the City's Planning Department define multi-family housing as 3 or more units. This chapter does not include small residential homes or parking lots/structures. Although this chapter focuses on traditional commercial and industrial buildings, the strategies

and actions included here do apply to the building envelope and large systems of multi-family residential buildings.

This plan addresses separate components of industrial facility GHG emissions in a similar fashion as residential buildings. The building envelope and large building related systems (HVAC and lighting) of industrial facilities are addressed along with other large building types in Strategies 1 - 3. The processes and equipment located within the building that run on energy are addressed in Strategy 4 of this chapter and include the following types of buildings in addition to traditional industrial processes, health care facilities, food processing and retail operations, water and wastewater processing, steam generation, etc.).

There are three primary ways in which buildings, processes and equipment can reduce GHG emissions: implementing efficiencies, electrifying, and sourcing renewable or low to no emissions energy.

Grand Rapids experiences four climate hazards: rising temperatures and heat, heavy rainfall and flooding, severe convective storms, and drought. [3] Of these, buildings will be most impacted by increases in temperature, extreme weather events and precipitation. Rising temperatures will increase the demand for air conditioning (electricity) and decrease heating needs (natural gas). Increased extreme weather events will cause more electricity power outages (damage to power lines) and likely increase the duration of the outage. Increased precipitation and drought will both impact humidification needs (electricity). Processes and equipment that run on electricity will be most impacted by power outages.

Equity & Health Impact

People spend 90% of their time inside of buildings. Well designed and constructed buildings support better indoor and outdoor air pollution and can decrease respiratory impacts from mold and dampness and increase comfort and productivity.

Respondents to the CAAP survey indicated that increased energy bills, extreme heat and power outages were priorities for them with respect to our changing climate and how it will impact their lives. A few of the concerns they shared include:

- People will take refuge inside buildings during extreme heat incidents; reliable and efficient air conditioning will be critically important as well as protective and efficient building envelopes (window treatments, insulation, etc.)
- Heat-related health issues
- Power outages will have a significant impact on building operations and increases opportunities for onsite energy generation (solar) and storage (batteries, etc.)

When analyzing the intersectionality of Grand Rapids historical redlining map and industrial zoning map from the Community Master Plan, where residents of color were redlined overlaps with industrial zoning and continues to be where our Black and Brown communities currently reside. The health issues experienced in these communities includes poor air quality, high concentrations of asthma, lead poisoning and negative birth outcomes. [3] In addition, heat hazards are also greatest in areas where residents of color live. Heat hazards are caused by paved surfaces such as building roofs, roads and parking lots, which are larger in areas with a higher proportion of industrial land use. [3]

Lastly, a lack of representation and resources for BIPOC in the development, design, construction and operation of buildings remains a barrier. Small and minority-owned businesses are more likely to face outsized impacts from climate change. For those businesses looking to move toward GHG reductions, the utilities typically are not able to break down performance of their energy waste reduction and rebates programs. Utilities are unable to demonstrate to what extent small and minority-owned businesses are receiving their fair share of rate generated contributions to these programs and anecdotally, it is likely that smaller businesses that do not have energy staff or consultants are subsidizing the amount of energy rebates that larger companies are receiving. Additionally, employees working in warehouses, factories and industries without cooling are at increased risk of health impacts due to increased extreme heat.

What's Happening Now & Barriers

Development in Grand Rapids is increasing for multi-family residential units to address the housing gap, with limited industrial development. The City of Grand Rapids offers a Property Assessed Clean Energy (PACE) program for qualifying renewable energy and energy efficiency projects for commercial buildings in partnership with Lean and Green Michigan. However, due to market forces no development has completed the PACE process.

PACE Program

The Grand Rapids 2030 District, a local voluntary program committed to creating high-performing buildings that reduce GHG emissions and increase marketability and profitability for property owners, has acted as a resource since 2015. While GR 2030 offers a significant amount of education, resources and tools to the building sector, there is minimal enrollment or compliance with data reporting.

There are significant barriers to reducing energy consumption and emissions generation from the building sector in Grand Rapids. Many of our existing buildings are old and it is cost prohibitive, and at times structurally or mechanically prohibitive, to implement some kinds of efficiencies, electrification or on-site renewable generation. Many businesses also require a one- or three-year return on investment (ROI) for capital project investments. While there are many opportunities to pursue

projects that meet this requirement, there are many efficiency projects that have large ROIs; they just require more than three years to be fully realized. ROI is also compounded by difficulty of securing financing to implement energy efficiency and renewable energy projects.

These buildings were also constructed under past building and energy codes, which often did not require insulation or high efficiency energy systems. In Michigan, the State adopts building and energy codes. The International Energy Conservation Code (IECC) updates the code every three years. While the State of Michigan has been working to update the codes to the 2021 version, it is still using the 2015 IECC codes. Research has demonstrated that a building constructed under the 2021 versus 2015 codes will be approximately 30% more energy efficient. Both of these codes prohibit local municipalities from requiring more energy efficiency or other high performing energy systems or designs. The IECC is currently working on the 2024 codes.

Furthermore, the State of Michigan, via the Michigan Public Service Commission (MPSC), regulates energy utilities, including approving the rates they charge to businesses as well as the amount the utilities credit back to a property that generates more solar electricity than it uses (distributed generation). The C-CAT discussed several instances in which participants were interested in installing solar on-site at their property but could not make the business case work due to the distributed generation rate.

While there are a variety of opportunities for building stakeholders to purchase renewable energy credits (RECs) or carbon offsets – they will always be at an additional price. In other words, building stakeholders will always pay a cost premium in addition to the cost of the energy the building consumes when they purchase RECs or carbon offsets. As buildings can only get so energy efficient, the on-site installation or purchase of credits will always be required for a building to achieve zero emissions.

Many local businesses do not have the resources to employ a full-time energy manager. In addition, requesting, receiving and analyzing energy and emissions data is extremely labor intensive. This leaves building stakeholders in a position of making capital and operating investments without actual data that would demonstrate the ROI of energy efficiency investments. Due to these concerns, some commercial building stakeholders have expressed considerable concerns and opposition to any municipal policy interventions intended to reduce energy consumption and costs.

In partnership with the Michigan Green Building Collaborative (formerly the U.S. Green Building Council of West Michigan), The City of Grand Rapids is working to reduce GHG emissions in the commercial building sector through the E.H.Zero Initiative by engaging with the business community on best practice policies and

programs from other municipalities with the aim of co-creating a package of potential policies and programs for consideration in Grand Rapids. The City currently participates in the White House Building Performance Standard Coalition to support cutting emissions from the building sector and has established a commitment to lead by example by moving towards reducing energy and GHG emissions within its own facilities. The City is working across all departments (Fire, Parks, Facilities, etc.) who manage various buildings and facilities to collaborate on achieving its established municipal GHG reduction goal.

E.H.Zero Initiative

Planning & Funding Considerations

To meet the needs of building owners and operators, existing resources need to be expanded, and new resources established. The GR2030 District is the lead organization in our community for energy efficiency, data tracking, and electrification and with expansion can engage BIPOC and small businesses and maintain a centralized resource hub. The development of renewable energy resources will also be important to reach GHG reduction goals.

When analyzing and considering best practice case studies from other communities taking into consideration that a one size fits all approach may not be the right fit with Grand Rapids wide variety of building types, energy users and emissions generators. Any potential policy under consideration should also address the capacity limitations and potential funding needs of building owners and operators for compliance.

It is important to note that the Vicinity Energy (Vicinity) steam plant located in the urban core of the city is an industrial facility and included in the industrial emissions calculated in the GHG Inventory. Vicinity currently purchases natural gas from DTE Energy to produce steam that is then supplied to a large number of buildings downtown. However, Vicinity has also purchased an electric boiler that expected to enter service in 2026, which will alter the emissions associated with that large industrial facility. Furthermore, Vicinity has desires to source renewable energy to power its electric boiler, which would result in zero emission steam for its customers (green or e-steam). Continuing partnership with Vicinity in the pursuit of renewable energy for the steam district will provide a significant emissions reduction to our downtown building stock.

E-Steam

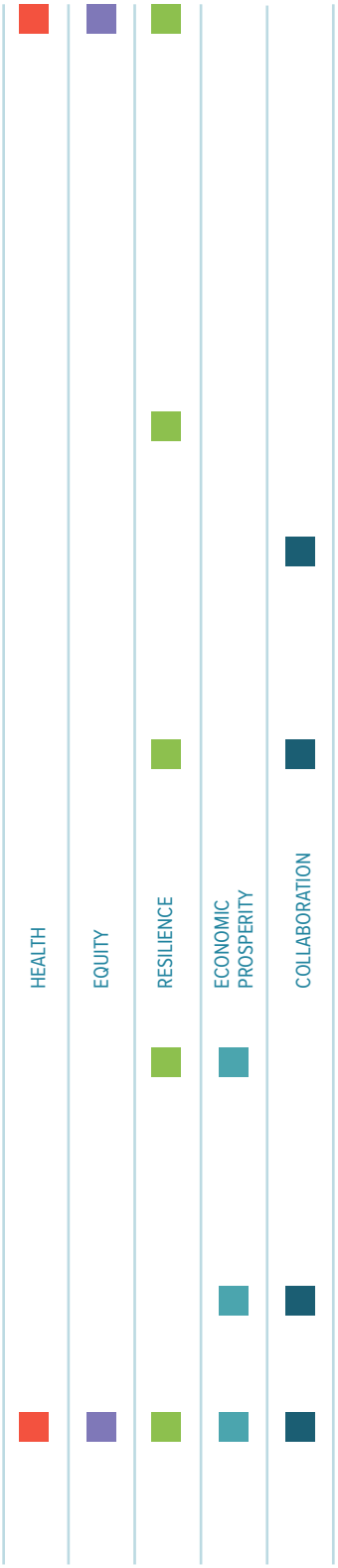
Desired Future Impact

For the building sector, building owners will see reduced operating costs due to reduced energy consumption and associated utility costs. Due to GHG reduction and increasing climate resiliency, buildings are safe, healthy and supportive of tenants, residents and participants during operational hours and during times of emergencies. Where appropriate, buildings are constructed to be solar ready and are prepared for on-site renewable energy generation when funding or financing is available. Lastly, through education and resources, an increase in diversity of participation in building industry occurs in our community.

HEALTH	EQUITY	RESILIENCE	ECONOMIC PROSPERITY	COLLABORATION

Strategy 1: Increase community awareness, understanding of, and capacity to address how much energy buildings use and the emissions they generate.

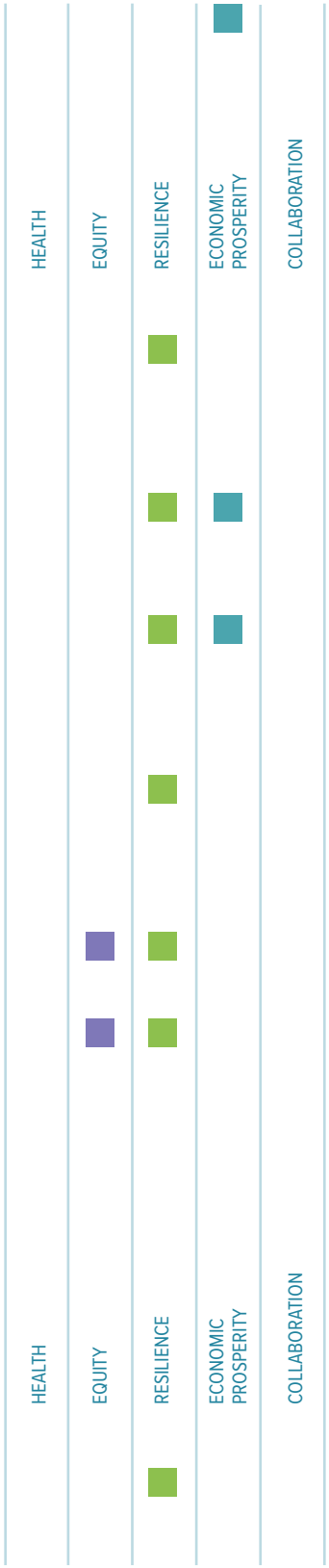
- **Action 1:** Help building stakeholders (developers, owners, operators, tenants), especially small and minority-owned businesses, access funding and financing to implement energy efficiency, renewable energy, climate resilient and sustainable and healthy projects (utility rebates, PACE, on-bill financing, grants, green revolving fund, tax incentives, low to no-cost loans, etc.), prioritize sustainable funding mechanisms, and ensure they are on the most cost-effective rates.
    - o Partner with Corridor Improvement Authorities to provide education and resources.
- **Action 2**: Enhance access to and use of actual data (energy use, cost, emmisions) in building development, design, construction and operation decisions.
    - o Partner with utilities to improve streamlined access to data at the building, company and census tract level.
    - o Educate and support businesses and organizations reporting data via the free U.S. EPA Energy Star Portfolio Manager program, enrolling in the free GR2030 program and considering GR2030's low-cost Automated Benchmarking Service (ABS).
    - o Educate building stakeholders on services that support evaluating the actual performance of buildings and improvements, including return on investment, avoided costs, and emissions reductions.
- **Action 3:** Engage parties interested in catalyzing career development, green entrepreneurism and contractor training programs focused primarily on serving communities of color and marginalized communities to address energy and emissions associated with buildings.
    - o Create and advertise a list of BIPOC-owned green contractors list.
    - o Enhance education programs by adding energy management, resiliency, electrification and renewables into the curriculums of K-12, higher education, employer-offered education, certifications, trades, etc.
- **Action 4:** Expand and enhance the Grand Rapids 2030 District's educational programming, case study development, and available tools and resources to support the decarbonization of buildings with a focus on small and minority-owned businesses and organizations. [CMP 2.C.3]



- **Action 5:** Prioritize health and wellness, sustainable design elements, resilience and safety in building development, design, construction, and operation decisions, including on-site green infrastructure (ex. green roofs, pervious paving), systems that account for increased temperatures and more extreme heat (air-conditioning, humidification), designs and protection for flooding and power outages (insurance coverage), third party design and operation certifications and indoor air quality.
    - o Prioritize old school buildings, factories with uncomfortable working conditions, residential buildings without A/C, and small and minority-owned businesses.
- **Action 6:** Continue to advocate for State of Michigan building sector legislation and regulations that reduce carbon emissions, support climate adaptation and increase climate resiliency.
- **Action 7:** Increase awareness, understanding and integration of what is needed at the building level to support innovative and low emission energy technologies and systems, including electrification/all-electric buildings, heat pumps, thermal energy, geothermal, solar, storage, electric vehicle charging, and vehicle to grid (V2G).
- **Action 8:** Enhance awareness and education on building and electrical infrastructure needs to support, even at a future date, electrifying systems or appliances and supporting on-site solar, storage and/or electric vehicles.

Strategy 2: Reduce the amount of energy used and the emissions generated by existing buildings.

- **Action 1:** Continue to evaluate building energy or emissions reduction policy opportunities by identifying best practices that reduce undue burden for reporting and compliance through financing options and capacity support (example policies include benchmarking and transparency requirements, building performance standards, tune-up or audit requirements, retrocommissioning requirements, etc.).
- **Action 2:** Support the creation of a weatherization and efficiency program for commercial, industrial and multi-family residential buildings to help reduce energy bills.
- **Action 3:** Support the development of a specialized navigator program focused primarily on small and minority-owned businesses that supports planning, financing, implementing and evaluating energy efficiency, renewable energy, electrification and climate resilience projects.



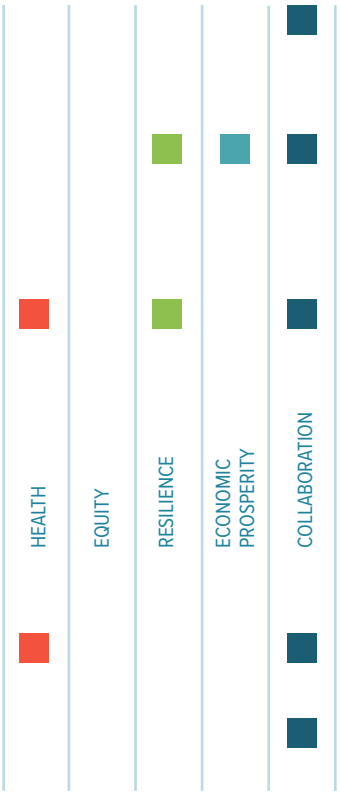
- **Action 4:** Report on and publicly share annually the City of Grand Rapids' work to reduce energy and emissions from municipally owned facilities and utilities, including renewable energy and GHG performance, financial investments and anticipated savings.

Strategy 3: Ensure that new construction buildings are high-performing, low to zero-emissions, and climate resilient.

- **Action 1:** Continue to advocate for stronger and more frequently updated state building and energy codes that emphasize energy efficiency, electrification and renewable energy, increasing resources to enforce the code, and allow local municipalities to go beyond the code.
- **Action 2:** Explore potential incentives to support energy efficiency, electrification, renewable energy, and climate resilience in the siting and construction of large buildings.
- **Action 3:** Evaluate and create recommendations on how the City could embed high-performing and low to zero emissions building design, construction, operations, including all electric, solar ready and third-party certifications into City incentives.
- **Action 4:** Update a City policy requiring the evaluation and prioritization of high-performing, low to zero-emissions, and climate resilient new construction and major renovation for City-owned projects and encourage other GR-based businesses and organizations to adopt a similar policy.
- **Action 5:** Educate on climate resilient building design practices (e.g. cool roofs, etc.).
- **Action 6:** Increase awareness and understanding of embodied carbon and low-impact construction principles that emphasize the importance of prioritizing materials that include reused or recycled content (e.g. hemp concrete, Mass Timber, etc.), the reuse of an existing building, and deconstruction versus demolition.

Strategy 4: Reduce the amount of energy used and the emissions created from industrial processes and increase resilience of energy-intensive processes [Energy-Intensive Processes Stakeholders].

- **Action 1:** Continue to reduce energy consumption or find alternative clean energy resources for the City's Water, Environmental Services, and other City facilities.



- **Action 2:** Continue to support the cannabis industry's compliance with the City's licensing ordinance that requires environmental sustainability and ensure these requirements remain best practice.
- **Action 3:** Partner with Vicinity Energy to continue to implement efficiency projects and pursue electrification of steam generation and the sourcing of renewable energy as a strategy to reduce process emissions as well as help their downtown customers achieve building related emissions reductions.
- **Action 4:** Establish a workgroup that focuses on energy and emissions associated with large-scale intensive process decarbonization to evaluate electrification, fuel switching, efficiencies, heat recovery and reuse and other technologies or process improvements, for facilities that house: cooking, food preparation, storage and sale, healthcare services, laboratories, heavy industrial and manufacturing, indoor agriculture processes, etc.
    - o Pull together facilities team and product engineering teams to discuss air exchanges, humidification and other process improvements.
- **Action 5:** Increase education and awareness of the energy and emissions impact of the supply chain, and the construction and demolition industry.
- **Action 6:** Increase awareness of and participation in refrigerant recycling and deconstruction practices, especially for low volume refrigerant users.

Transportation

Community Goals

Goal: 10% vehicle miles traveled reduction per capita by 2030 through the promotion and expansion of active and shared modes of transportation

Goal: 20% increase in ridership for public, active, and shared modes of transportation by 2030

Goal: 22.5% of vehicle miles traveled is with electric vehicles by 2030

Climate Impact

Sustainable transportation plays a crucial role in both climate mitigation and adaptation. Transportation is one of the highest emitting greenhouse gas sectors in Grand Rapids making up 30% of total community-wide greenhouse gas (GHG) emissions. Transportation GHG emissions are primarily from gasoline and diesel fueled automotive vehicle but also encompass hydrogen and ethanol fuel. By increasing the use of public transit, as well as shared and active modes of transportation, Grand Rapids can significantly reduce greenhouse gas emissions and microplastics in waterways associated with private vehicle use. [24] Installing electric vehicle (EV) infrastructure, building more dedicated and protected bike lanes, and expanding the variety of modes available to residents in all neighborhoods can help in this transition.

Grand Rapids' transportation system, which includes built assets like roads and bridges as well as public transit, bicycling, and pedestrian infrastructure, is sensitive to climate change. Heavy rainfall and flooding can overwhelm dispersed stormwater infrastructure and impact infrastructure usability. Trail networks near rivers and streams can be affected by high water levels, streambank erosion and failure. Heat already impacts the usability of transportation systems for people, who are exposed to heat while walking, bicycling, and waiting at transit stops. Other extreme weather

conditions, including winter weather, heavy rainfall, and poor air quality, can make it uncomfortable and even dangerous to wait outside for public transportation. A robust public transit system enhances community resilience by providing reliable transportation during extreme weather events and other disruptions. Expanding shade structures, green spaces and integrating nature-based solutions into transportation infrastructure can help manage stormwater, reduce heat hazard impacts, improve air quality, and promote biodiversity.

Equity & Health Impacts

Sustainable transportation initiatives can have significant equity, safety, and health implications. Low-income communities and communities of color often bear the brunt of transportation inequities, including limited access to public transit and safe walking and biking routes. Highway U.S. 131, managed by the Michigan Department of Transportation, runs through the center of the city near neighborhoods of focus. Highways can increase vehicle travel and idling, which in turn cause higher fuel consumption and, consequently, more GHG emissions and air pollution. Burning gasoline and diesel fuel releases particulate matter, nitrogen oxides, carbon monoxide and volatile organic compounds (VOCs), as well as carbon dioxide, into the air. VOCs can react with nitrogen oxides to produce ozone pollution, the nation's most widespread outdoor air pollutant. Areas near high-traffic roadways often have much higher levels of pollution than the rest of the community. [36] By prioritizing equitable transportation solutions, Grand Rapids can ensure that all residents have access to healthy, reliable transportation, which is crucial for accessing jobs, education, and healthcare.

Promoting active transportation can lead to improved public health outcomes by reducing obesity rates, increasing physical activity, and decreasing air pollution-related illnesses. Furthermore, enhanced public transit can alleviate traffic congestion, resulting in cleaner air and fewer respiratory health issues. For those who already bike and walk regularly, increasing safety communications could help reduce the number of incidents and fatalities along roadways. Additionally, a safer community for walking and biking encourages those who currently drive their own vehicle to try alternative mobility options.

Photo Credit: Mobile GR

What's Happening Now & Barriers

As urban areas confront the realities of climate change, sustainable transportation has emerged as a vital component of climate planning. In Grand Rapids, the focus on sustainable mobility not only addresses environmental challenges but also enhances community well-being and economic vitality.

Currently, Grand Rapids is making strides in sustainable transportation, but significant barriers remain. The City has invested in expanding bike lanes and improving pedestrian safety infrastructure, enhancing public transit services through a partnership with

The Rapid which includes the DASH (Downtown Area Shuttle), a free circulator connecting a number of key areas in and around downtown, piloting a now permanent shared micromobility program in 2020, and launching a fully electric EV carshare in 2024. The Vital Streets program has made strides around reducing impervious area, traffic calming, efficient traffic management to reduce emissions (e.g. roundabouts and signal optimization) improving existing sidewalks, closing gaps between existing sidewalk sections, adding enhanced bike facilities, planting trees within the right-of-way, improving water quality, managing flow, and preventing standing water and flooding. A number of community organizations actively promote biking and walking, while the City integrated sustainable practices such as promoting active transportation, electric vehicles, and increased land use density into the Community Master Plan.

Grand Rapids' free Downtown Area Shuttle
Photo Credit: Mobile GR

DASH
The Downtown Area Shuttle

Through the Grand Valley Metro Council (GVMC) Grand Rapids is partnering with surrounding communities on standardizing on design, wayfinding, and policies so persons crossing jurisdictional lines know the expectations for interactions between vehicle, bike, e-bikes, and pedestrians. The West Michigan Regional Trails Master Plan, a plan for nonmotorized, multi-use pathways connecting West Michigan communities and destinations, was completed in October 2024 by West Michigan Trails. This plan aims to identify the current state of regional trails, the needs of those trails and the overall network, and sets priorities for Development.

Despite these efforts, challenges such as limited funding, outdated infrastructure, and cultural attitudes toward car dependency hinder progress. Public transit operated by the Rapid faces issues with ridership due to reliability, and frequency, making it less attractive to potential users. However, an increase in density and ridership is needed to fund increasing the frequency and amount of bus lines causing a paradoxical challenge. City programs for shared and active transportation face challenges related to cultural attitudes and perceptions. Additionally, the city's layout often prioritizes vehicles over pedestrians and cyclists, complicating efforts to create a more balanced transportation system. While electrification of vehicles is needed to reduce emissions in the transportation sector, electric vehicle options are often more expensive, less accessible, reinforce traditional single occupancy vehicle usage, and pose potential waste and safety issues.

Planning & Funding Considerations

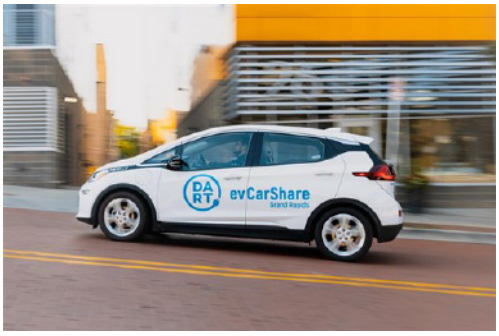
The federal government regulates vehicular fuel efficiency and the generation of vehicular fuels (ethanol content, etc.), which in conjunction with the purchase of vehicles drives the amount and type of fuel generated and distributed.

To achieve the desired future impact, Grand Rapids must address key planning and funding considerations. Sustainable transportation must be integrated into the City's broader development framework. Collaboration among city planners, community organizations, and residents is essential for developing effective transportation strategies that reflect the needs and priorities of the community. Securing funding for sustainable transportation initiatives and electric vehicle infrastructure will require a multifaceted approach, including seeking federal and state grants, public-private partnerships, planning and infrastructure from electric utilities to support electrification, and leveraging community investments.

Involving residents in the planning process will be crucial for building support for sustainable transportation initiatives. Community events, surveys, and outreach efforts can help identify community needs and foster a sense of ownership over transportation solutions.

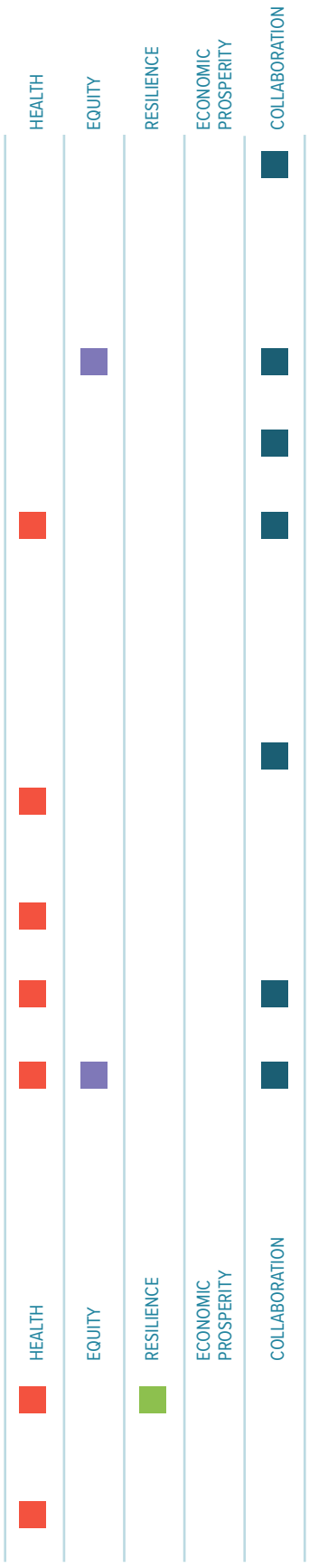
Desired Future Impact

The vision for sustainable transportation in Grand Rapids includes a seamless and interconnected transportation system that prioritizes public transit, cycling, walking, and shared mobility. This system will provide affordable, reliable options for all residents, fostering a culture of active transportation. A well-planned sustainable transportation network can boost local economies by increasing access to businesses, attracting new investments, and creating jobs in green industries. Enhanced mobility options can also lead to increased tourism and a stronger local economy. An increase in community well-being by improved access to green spaces and recreational areas, facilitated by safe walking and biking routes, will enhance overall quality of life for residents, promoting mental and physical well-being. Reducing GHG emissions through the transition to a transportation system that minimizes reliance on fossil fuels will lower the city's carbon footprint. Enhancing accessibility by creating and enhancing our transportation network to provide equitable access to all residents, regardless of socioeconomic status, age, or ability. Active and Shared Transportation will become a norm by encouraging walking, cycling, and shared mobility as viable and safe modes of transport to improve public health and reduce congestion. Sustainable transportation in Grand Rapids is a critical pathway to achieving environmental, social, and economic goals. By prioritizing equity, enhancing public transit, and promoting active and shared transportation, the city can mitigate climate impacts, improve public health, and foster economic prosperity.



Grand Rapids' evCarShare on the streets of Grand Rapids. Photo Credit: Mobile GR

DART
EV Car Share



Strategy 1: Educate residents for all transportation options and environmental impacts.

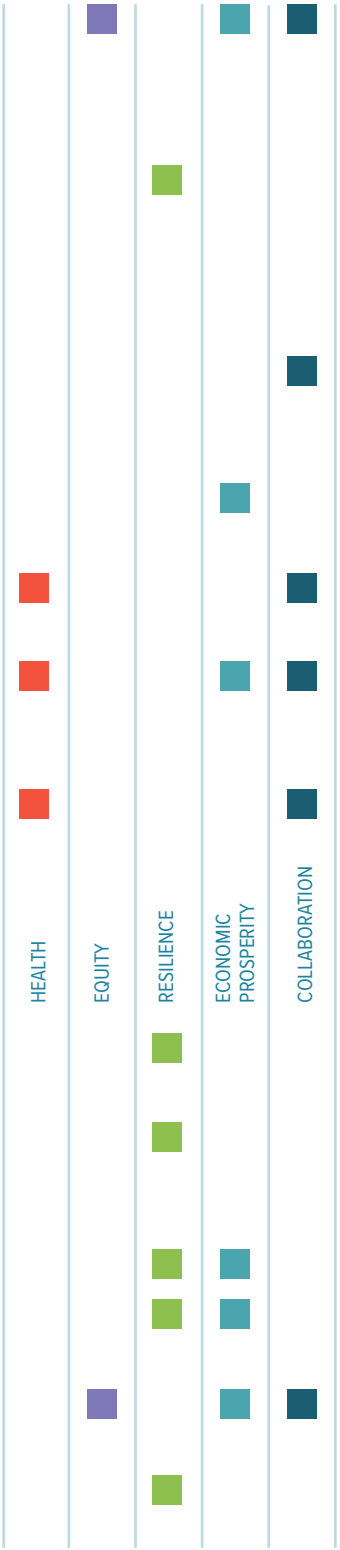
- **Action 1**: Host education events for new riders of the Rapid and City-supported programs such as Shared Micromobility, the DASH, and DART EV Carshare.
  - o Support The Rapid's community ambassadorship and community "adopt-a-stop" programs.
- **Action 2:** Communicate the wide range of transportation options available, highlighting their financial and physical accessibility.
- **Action 3:** Promote the micromobility affordability pilot program and develop new equity and affordability programs for shared micromobility.
- **Action 4:** Increase education and community engagement about street design (e.g., roundabouts), transportation choices and impact on climate change, health and the environment. [CMP 4.A.3]

Strategy 2: Expand and Protect Pedestrian Network and Amenities.

- **Action 1:** Develop a Pedestrian Action Plan.
- **Action 2:** Invest in installing new, accessible pedestrian safety infrastructure to help pedestrians cross the street safely at and between intersections. [CMP 4.B.7]
- **Action 3:** Communicate state and local pedestrian safety laws with tips for pedestrians, cyclists, and drivers.
- **Action 4:** Work with neighboring municipalities to increase resident access to trails and safe walking and biking networks.
- **Action 5:** Add new pedestrian amenities that incorporate accessibility.
  - o Partner with The Rapid to increase bus stop amenities (e.g., benches, glass shelters, shade trees or structures, etc.).
  - o Explore implementing a pedestrian only street downtown.

Strategy 3: Build Out a Safe Bicycle Network by Expanding Separated/Protected Bicycle Lanes and Increasing Access to Nonmotorized Transportation.

- **Action 1:** Invest in expanding and improving the network of bicycle infrastructure in Grand Rapids with a prioritization for safety and ease of use.
- **Action 2:** Install and expand new separated/protected bike lanes and safety infrastructure on major streets (e.g., reflective cones, bollards).



- **Action 3:** Explore the feasibility of innovative financing solutions like creating a green revolving fund, green cost share program, incentive, millage or other financial support programs to pilot a bicycle and e-bike voucher program with an income cap to prioritize low-income access. [CMP 4.B.3]
- **Action 4:** Maintain access to new and established separated bicycle lanes on major streets.

Strategy 4: Support Regional Projects that Promote Transit.

- **Action 1:** Unify communications throughout Kent County and the surrounding municipalities to educate and promote existing mobility options and future improvements.
- **Action 2:** Continue to support transit funding through advocacy at the state and federal level.
- **Action 3:** Work with regional partners to improve access to key high traffic corridors with pedestrian safety and crossings (e.g., 28th street).
- **Action 4:** Develop City incentives for employers who promote the use of Public Transit, Shared Micromobility, biking, and carpooling as alternatives to driving their own vehicle to work.
- **Action 5:** Meet with local community organizations to identify gaps in regional transportation services.

Strategy 5: Focus Land Use Practices on More Accessible, Dense and Less Car Centric Neighborhoods. [CMP 4.C.3]

- **Action 1:** Allow a greater variety of housing types in low-density residential zone districts. [CMP 1.B.2]
- **Action 2:** Allow higher density residential in the Mid-Century and Modern Era neighborhoods where adequate transportation infrastructure is provided. [CMP 1.B.3]
- **Action 3:** Support infill development at an appropriate scale. [CMP 2.A.3]
- **Action 4:** Update the zoning ordinance to encourage density in mixed-use areas along transit corridors that serve residents and businesses. [CMP 2.A.1]
- **Action 5:** Establish Mobility Hubs that connect neighborhoods, employment centers, and public transportation systems. [CMP 4.C.3]
- **Action 6:** Reassess parking requirements for new developments and limit the size of surface parking lots. [CMP 4.C.2]

HEALTH
EQUITY
RESILIENCE
ECONOMIC PROSPERITY
COLLABORATION

- **Action 7:** Prioritize walkability and bikeability in new development and roadway projects. [CMP 4.C.6]
- **Action 8:** Require a plan to encourage people to use modes of transportation other than driving alone when large developments are proposed within identified nodes. [CMP 2.B.1]

Strategy 6: Promote accessibility to electric and low to no emission vehicles including supporting EV Infrastructure for Community and Individuals.

- **Action 1:** Conduct community engagement about EVs to get a better understanding of resident interest, concerns and potential opportunities.
- **Action 2:** Increase access to EV charging infrastructure. [CMP 4.B.3]
  - o Evaluate the distribution of publicly accessible charging opportunities and establish a target for charging stations by area, factoring in residential and employment densities, and demographics, to project demand.
  - o Ensure zoning requirements for privately owned off-street parking lots and decks require the installation of a minimum number of chargers based on the number of parking spaces.
- **Action 3:** Provide education on how to access incentives for first-time EV buyers.
- **Action 4:** Expand and promote the DART EV carshare pilot program.
- **Action 5:** Support The Rapids' development of a Zero Emissions Bus transition plan.
- **Action 6:** Continue to support electrification of transportation through advocacy at the state and federal level.

HEALTH
EQUITY
RESILIENCE
ECONOMIC PROSPERITY
COLLABORATION

Strategy 7: Electrify City Fleet and Provide Support to Other Fleets within Municipal Boundaries.

- **Action 1:** Pilot a City e-bike fleet with charging infrastructure and maintenance and address any barriers to implementation. [CMP 4.B.3]
- **Action 2:** Training/hiring specialized technicians to service a wide range of City Fleet EVs.
- **Action 3:** Provide support and guidance to other fleets on the electrification process.
- **Action 4:** Create electrification roadmap for City fleet vehicles.

Nature Based Solutions

Community Goals

Goal: Achieve 40% Tree Canopy Goal to increase carbon sequestration

Goal: Ensure that both people and the natural environment are healthy and resilient to the impacts of climate change

Climate Impact

Trees reduce GHG emissions by removing carbon dioxide (CO_2) from the atmosphere through photosynthesis. In Grand Rapids forests sequester 0.2% of total gross emissions and trees outside of forests sequester 0.6% total gross emissions, for a combined 0.8% total sequestration (or removal) of greenhouse (GHG) emissions. Although Grand Rapids is an urban environment with mostly built out land use, increasing trees on public and private properties is a key strategy to mitigate GHG emissions and an important action to address climate change. [12]

Trees and green spaces have the ability to both reduce greenhouse gas emissions but also help address the hazards climate change will increase in our area – reducing stormwater runoff, reducing flooding and heat exposure. Neighborhoods with denser tree canopies are cooler than neighborhoods with less dense tree canopies. The roots of trees help to reduce flooding by drawing water into the plant. In this way, tree canopies reduce risks of both heat and flooding. [11] Access to green spaces cannot only improve people's physical health and resilience to climate change, but also their mental health from a connection to nature, increasing people's ability to fit physical exercise into their daily life and creating gathering spaces for social connection and community well-being.

A Just Climate Future

"There should be as much green as there is concrete within the city. The lack of trees will only make the heat desert island effect worse and cause more fatalities due to heat.

We need large tree coverage to help provide shade and to help filter out greenhouse gases. We also need better public transit options to reduce car dependency and promote walkability."

– CAAP Survey Respondent, October 2023

Impervious surfaces such as roads, sidewalks, parking lots and driveways, have two main impacts on climate risk. First, they prevent rain from being absorbed into the ground, increasing the pooling of water at the surface and stressing sewer systems which can lead to flooding and sewer overflows. Second, they absorb and slowly release the Sun's heat back into the neighborhood. Communities with more impervious surfaces can be several degrees hotter than neighborhoods with less pavement. [12]

Equity & Health Impact

Heat hazard, known as the urban heat island effect, is shown across Grand Rapids in the map below calculated from land surface temperature data, impervious surface

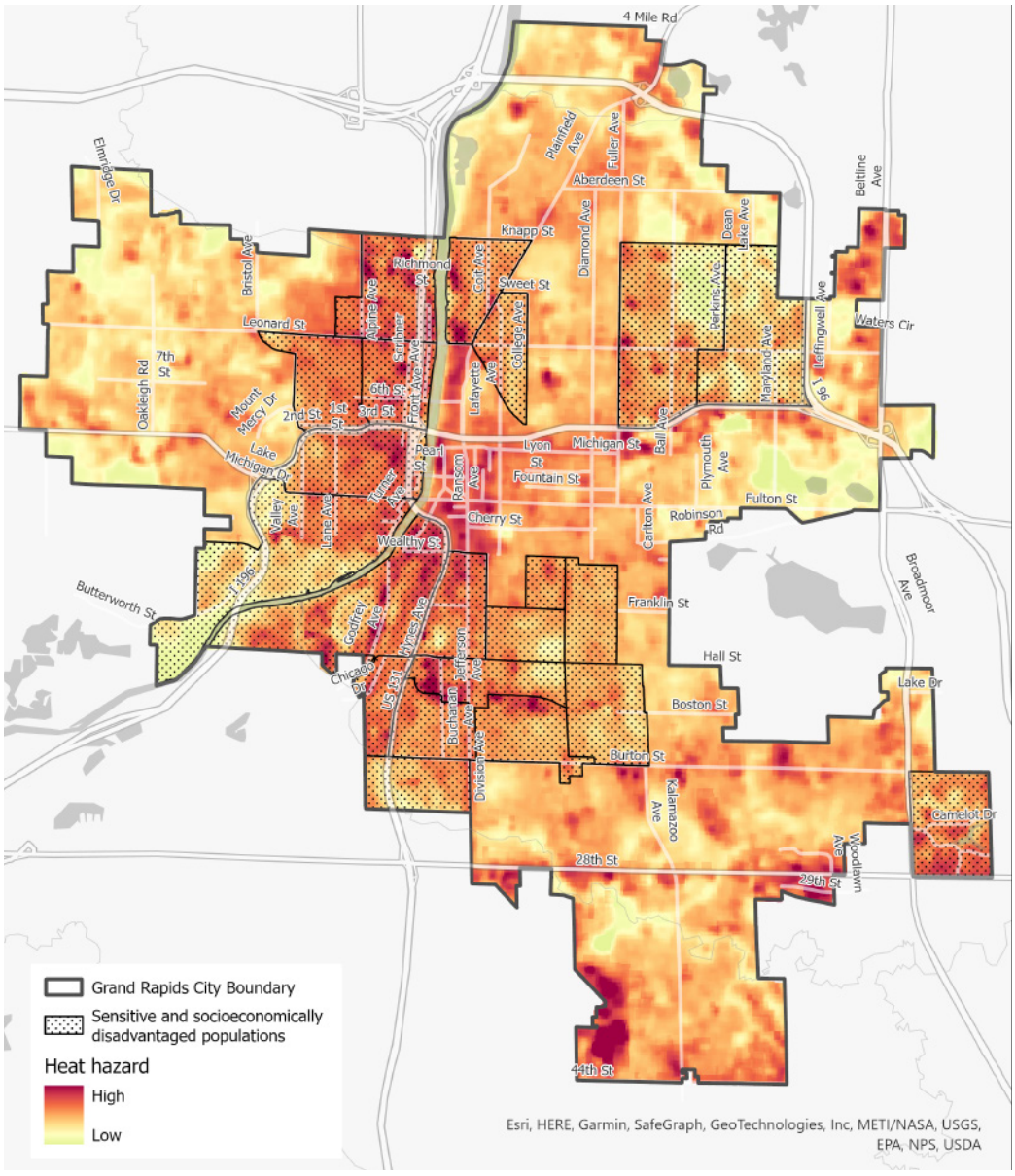


Figure 14: Grand Rapids Heat Hazard Map [3]

coverage, and tree canopy coverage. The darker red shading indicates higher heat hazard, which often correlates with the city's NOFs and large commercial corridors. As discussed in the Climate Justice chapter, areas in Grand Rapids that underwent government sanctioned segregation (redlining) in the past still have higher concentrations of people of color. These neighborhoods also have larger amounts of impervious surfaces, less tree canopy coverage and higher land surface temperatures. These overlays indicate our communities of color are therefore more vulnerable to the impacts of climate change (both extreme heat and flooding). Extreme heat can cause health effects such as heat cramps, heat exhaustion, heat dizziness. Heat stroke can also happen during high temperatures when the body is not able to cool itself by sweating. Heat waves can also worsen chronic conditions including cardiovascular disease and diabetes-related conditions.

For flooding increases in waterborne disease outbreaks have been reported following a heavy rainfall. Buildings that experience water intrusion can also develop mold contamination, which can lead to indoor air quality problems. [30] Access to green space increases both physical and mental health. Studies show that human interaction with nature reduces high heart rate and blood pressure and increases immune system function. [25]

Trees and vegetation also improve outdoor air quality. Airborne pollutants may deposit on tree leaves, directly removing them from the air. These include particulate matter (PM), nitrogen oxides (NO_X), sulfur dioxide (SO_2), carbon monoxide (CO), and ground-level ozone (O_3). Roadside vegetation that is tall and dense can lessen downwind pollutants by approximately 30%. [25]

Lastly, rising temperatures could lead to species of trees, plants, animals, and insects moving into Grand Rapids from other areas, while local species could be harmed due to a lack of winter freezing. Changing seasonal conditions could also cause wildlife and pests (e.g., ticks, mosquitos, rodents) to become active at different times of year, spread into new areas, and increase health risks for vector-borne diseases, such as West Nile Virus and Lyme Disease.

A Changing Climate

"Lots of newly planted trees near us did not survive the recent drought and the lack of trees makes it much less comfortable to go places without a car. Heavy rain events also make it harder to plan things – I hardly dare go tent camping anymore."

– CAAP Survey Respondent, March 2024

What's Happening Now & Barriers

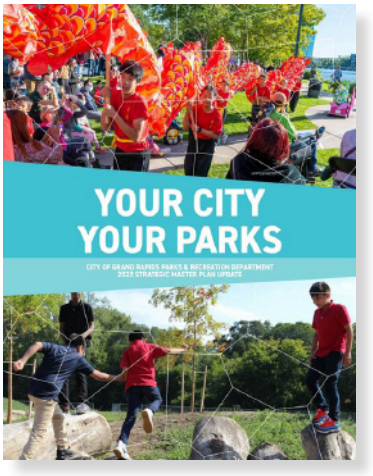
During the recession of 2008, the City of Grand Rapids Parks and Recreation Department experienced budget cuts, leading to reduced park maintenance. Neighborhood volunteers created Friends of Grand Rapids Parks to assist with basic park maintenance to help keep these spaces open for children throughout the city. Today, the City of Grand Rapids has a strong and thriving parks department in part to parks millages passed in 2013, and the newest dedicated parks millage approved by Grand Rapids voters in 2019. The new, evergreen millage allows continued investment in City parks. It provides approximately $5 million each year for repair, maintenance, and new improvements to parks, pools, and playgrounds. Friends of Grand Rapids Parks role has changed to work in partnership with the department to meet the goals of the city's Community Master Plan by creating stewards for parks and trees through volunteerism, urban forestry, park activation, and philanthropy.

Within the Parks & Recreation Strategic Master Plan the department has established a goal for every resident to have access to a high-quality park within a 10-minute walk or roughly a half a mile. Green space access isn't defined just by the distance to a park, it includes how safe and easy it is to get to a park, the quality of a park, and if residents feel safe. Feeling welcomed into park spaces is an environmental justice concern from community and solutions to address this also need to be included. Through the park millage the department is completing park renovations and

additions with a focus on equitable distribution to neighborhoods with less access. Outside of parks and forestry there is no clear mandate on ecosystem management, which must compete with other priorities for limited funding and creates capacity and resource gaps.

Some parks along the river, including Riverside and Ab-Nab-Awen, are allowed to flood to prevent flooding upstream. Parks staff must regularly return river-edge parks to usable condition following flooding, which requires resources. [3] After the 2013 flood in Grand Rapids flood walls were installed along the Grand River and currently a flood protection system is in place to regularly increase the height of the flood protection system to maintain efforts to increase protection levels with river edge projects and incorporate freeboard criteria levels.

In urban areas ecosystems and biodiversity are generally confined to small, managed areas, and are under pressure from human activities, development, pollution, invasive species, and imbalances (e.g., overabundance of deer). Changing seasonal conditions, increasing temperatures, decreased freeze-thaw cycles, storms, heavy rainfall, and flooding already cause substantial impacts on natural areas. Climate change and extreme weather events could weaken local trees causing urban tree canopy losses, and harm private and public landscaping and green spaces, negatively impacting ecosystem services.



The City's Parks & Recreation Department acted as a key partner for the Nature Based Solutions chapter of the CAAP with many of the strategies and actions echoing the information found in the Parks & Recreation Strategic Master Plan. Parks and Recreation is already in the process of working on some of the strategies and actions established in this chapter (in particular Strategy 2). These overlapping strategies and actions maintain already established priorities for our Parks & Recreation Department but also emphasize the need for additional community support and partnerships.

Planning & Funding Considerations

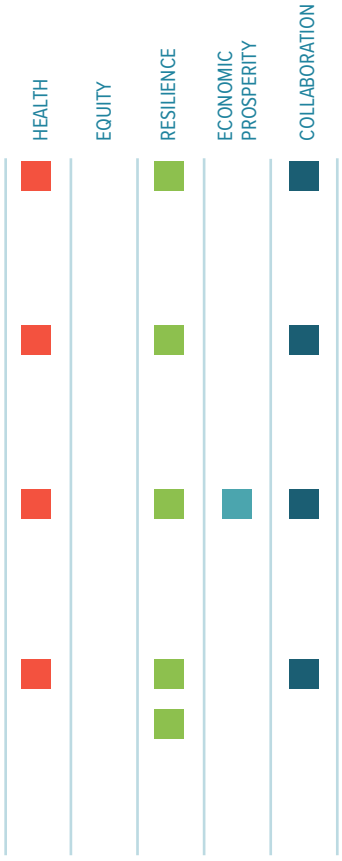
When asked in the CAAP survey how climate change will impact you the highest concerns around nature based solutions included disruption of outdoor recreation, decreased physical and mental health. Increasing access to green space was considered a top priority.

One potential harm to consider when working towards actions to increase access to green space and green infrastructure is the potential for green gentrification. Green gentrification occurs when efforts to make urban areas more environmentally friendly attract higher-income residents, which drives up property prices and the local cost of living displacing low-income residents. Anti-displacement planning efforts should be incorporated during green development projects to mitigate harm.

To meet the City's established tree planting goal a greater focus will need to be placed in community partnerships to engage private property owners, where there is more space to increase tree coverage. Lastly, quantifying the climate resilience impacts of nature based solutions will be important to access future funding opportunities.

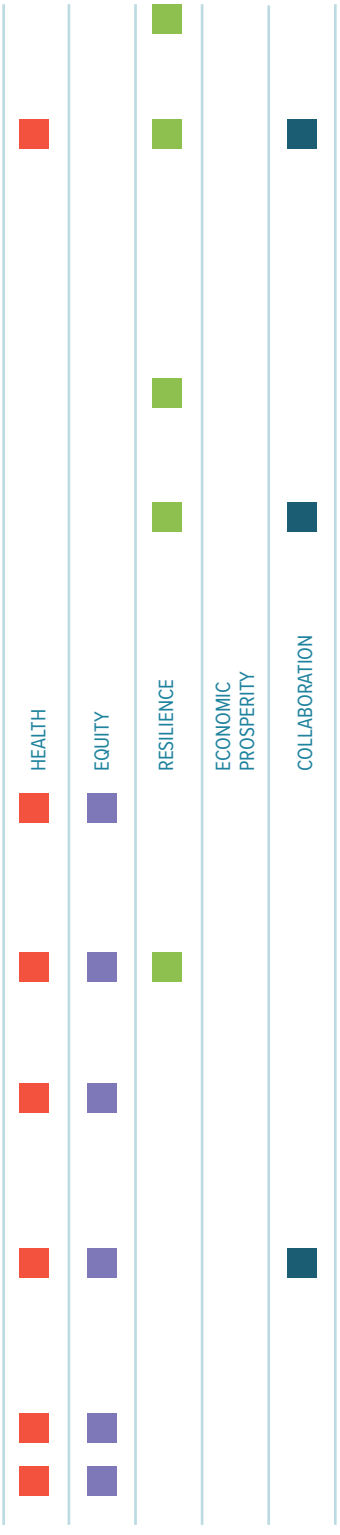
Desired Future Impact

Plants themselves provide a vital buffer to extreme climate change, and ideally community would invest back into nature. The future impact of advancing nature based solutions would include a larger canopy of well-maintained trees – both street trees that are properly matched to the site, as well as more trees on private properties. With increased access to and equitable distribution of green space Grand Rapids would be a thriving, nature-connected city where all can access the benefits of the outdoors. By working together to manage natural resources through green infrastructure, encourage regenerative land management practices, and access to environmental career trainings all residents will feel a connection with nature now and into the future.



Strategy #1 Continue and expand tree planting, preservation and maintenance programs, partnerships and incentives. [CMP 1.C.10]

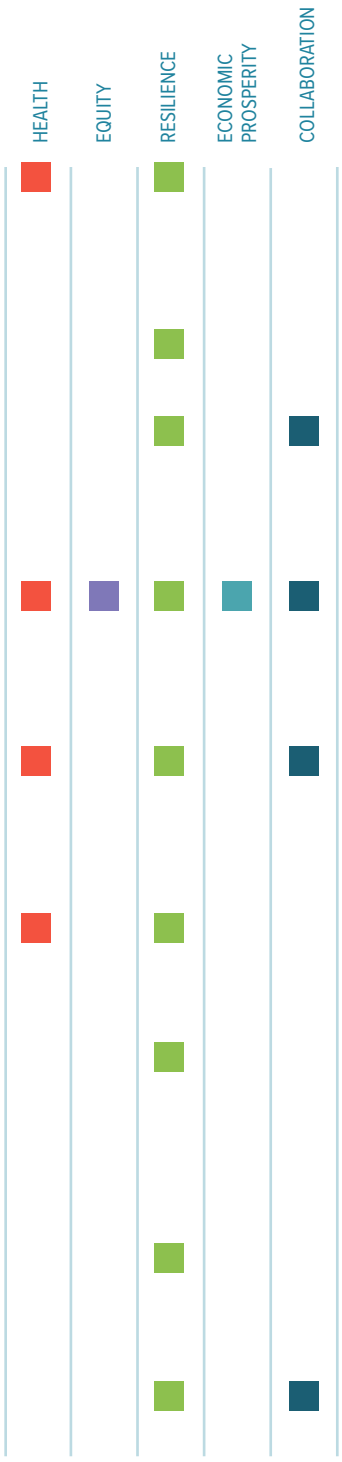
- **Action 1:** Prioritize neighborhoods with a low tree equity score, low-canopy neighborhoods and neighborhoods with populations at higher risk of adverse outcomes of urban heat island effects and outdoor air pollution, for tree plantings and habitat restoration.
- **Action 2:** Continue public and private partnerships to help reduce or share the cost of tree planting, green space and park maintenance (including trees in right of ways, medians, and green space) (e.g., Friends of Grand Rapids Parks).
- **Action 3:** Continue public and private partnerships to provide education and support on tree canopy preservation, proper tree maintenance, assessing tree removal (diseased or aged out) and helping giveaway trees on private property. (e.g., Friends of Grand Rapids Parks).
- **Action 4:** Increase tree plantings at public amenities (e.g., bus stops).
- **Action 5**: Address the preservation, health and wellness of the tree canopy by considering tree age, species, resilience to climate change impacts, and distribution diversity for tree plantings and ensuring proper maintenance of all trees (including trees in right of ways, medians, and green space).



- **Action 6:** Regularly update the Tree Canopy Study and assess potential updates to zoning ordinance tree canopy and preservation requirements and expansion of the tree canopy goal per industry recommended intervals.
- **Action 7:** Work to transition grass turf in the public right of way and educate the public to maintain appropriate sympathetic species to improve urban ecological health.
    - o Promote Plaster Creek Stewards' work supporting residents to design rain gardens in the right of way and register gardens with the City.
- **Action 8:** Consider increased storm activity in tree planting and management to proactively reduce potential risks (e.g., due to tree and limb failure) in storm events.
- **Action 9:** Develop standard protocols after extreme weather events for robust removal of storm debris that minimize carbon footprint of debris removal operations.

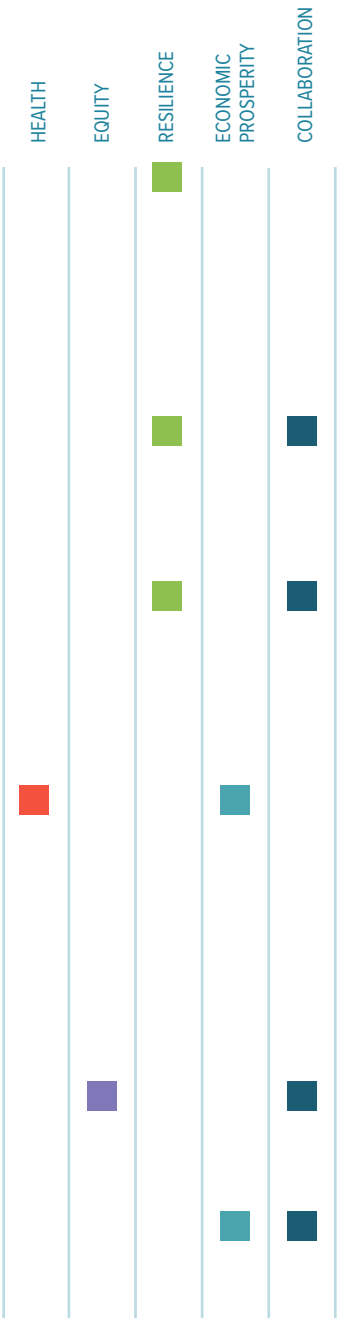
Strategy #2 – Foster positive health benefits by increasing access, and ensuring an equitable distribution, of public green space. [CMP 1.C.3]

- **Action 1:** Continue to identify opportunities to acquire additional parkland, prioritizing the City's neighborhoods of focus, to meet the Parks & Recreation goal for every resident to have access to a high-quality park within a 10-minute walk. [CMP 1.C.3]
- **Action 2:** Increase walking access to green space by improving sidewalks and trail connections to regional and local parks and greenways, prioritizing the City's neighborhoods of focus. [CMP 1.C.3]
- **Action 3:** Continue to incorporate trail infrastructure changes including universally designed trails, increasing natural surface trails where appropriate, trail guides for the blind and visually impaired, and additional safety measures such as lighting and emergency buttons.
- **Action 4:** Promote a sense of belonging and safety in the City's public parks by activating parks with outdoor education, multi-generational activities, cultural events, inclusive signage in multiple languages, park amenities and infrastructure improvements (lighting, benches, etc.). [CMP 1.C.3]
- **Action 5:** Increase equitable access to the Grand River and its tributaries.
- **Action 6:** Continue to support and expand air quality monitoring efforts in neighborhoods of focus.



Strategy #3 – Continue to prioritize green infrastructure development. [CMP 1.C.8]

- **Action 1:** Continue the implementation and maintenance of green infrastructure and reduction of impervious surfaces throughout the city by prioritizing funding for projects that maximize multi-benefits for human and ecological health.
- **Action 2:** Evaluate potential updates to the zoning ordinance minimum greenspace and urban open requirements to promote green infrastructure.
- **Action 3:** Promote the retrofit of conventionally landscaped areas to create green infrastructure or landscapes that regenerate ecosystem function (e.g., native plants) via Vital Streets, Park Improvements, and through private development opportunities.
- **Action 4:** Explore development incentives for converting non-functional or unnecessary impervious cover to green infrastructure, green spaces, or natural vegetation that provides open space access or ecosystem functions (e.g., green roofs) prioritizing neighborhoods of focus.
- **Action 5:** Continue public and private partnerships to help educate and engage with residents, design professionals, and businesses to increase green infrastructure on private property (e.g., rain gardens, bioswales, rain barrels, etc.). [CMP 1.C.8]
- **Action 6:** Prioritize daylighting waterways to assist communities in reducing polluted runoff, addressing flash flooding concerns, and improving the livability of the built environment.
- **Action 7:** Support additional natural flood protection measures such as the implementation of riparian buffers along the Grand River and its tributaries to prepare for increasing precipitation.
- **Action 8:** Minimize turf grass during green infrastructure projects.
- **Action 9:** Develop standards to incorporate watershed resilience considerations with a focus on riparian areas, floodplains, and wetland protection and revitalization.
- **Action 10:** Continue to collaborate regionally to collectively manage the Lower Grand River Watershed.



Strategy #4 – Encourage sustainable, regenerative land management practices.

- **Action 1:** Pursue an update to the zoning ordinance to include native and native-adapted plantings by adopting a Landscape Manual to capture evolving best practices and provide guidance for all projects subject to landscaping standards. [CMP 1.C.9]
    - o Evaluate recommended plantings and include plants that are suited for warmer climates, to account for climate change.
- **Action 2:** Collaborate with community-based organizations to create a Pollinator Aware Yard Care program to educate residents and evaluate funding resources to encourage year-round healthy pollinator habitats in residents' yards.
- **Action 3:** Use and encourage carbon-negative or low-carbon management practices, such as soil protection, limited mowing, no-mow, and conversion of high water use landscapes into drought resistant native and native adapted plantings in both City properties/park management, public right of way and private property.
- **Action 4:** Evaluate a potential incentive to support the replacement of gas lawn equipment with electric or non-motorized options.
- **Action 5:** Host or attend community engagement events in the City's neighborhoods of focus each year to learn about community / resident's reciprocal relationship with sustainable landscapes and educate people about sustainable landscapes, including trees, pollinators and native and native-adapted plantings.
- **Action 6:** Identify opportunities to work with GRPS, other schools/ universities, and libraries to ensure playgrounds and green spaces are resilient landscapes that promote functionality and minimize turf grass.
- **Action 7:** Identify opportunities to work with local community partners (e.g. Friends of GR Parks, Building Bridges) to encourage career development in environmental care and management.

Food Systems

Community Goals

Goal: Reduce waste related emissions by reducing food scraps sent to landfills, reducing solid waste and encouraging sustainable consumption.

Goal: Improve the health and resilience of the food system to the impacts of climate change.

Climate Impact

Climate change intersects with every aspect of the food system, a large consideration from community when prioritizing food systems as the second highest priority for the CAAP. Extreme weather and climate events can result in crop failures and loss of livestock, creating price spikes that can make nutritious food inaccessible to vulnerable communities. Wetter conditions and rising temperatures can also negatively affect food safety during transport, storage and processing.

National studies suggest that ***up to 40% of all food*** produced is wasted. Loss occurs at each step in the food system. Examples include unharvested crops in fields; unsold food from retail stores; and uneaten prepared food or kitchen trimmings from restaurants, cafeterias, and households. While approximately 40% of food waste occurs from the industrial sector, the largest volumes of food waste occur at the consumer or household level. In the City of Grand Rapids solid waste made up 2.6% of community-wide GHG emissions due to the combustion of solid waste generation from the Kent County Waste to Energy facility. However, food manufacturing processes within city limits are incorporated under industrial sector emissions. [31]

EPA's Wasted Food Scale is a curved spectrum showing best practice options for reducing the environmental impacts of wasted food. The options from most preferred to least preferred are prevent wasted food, donate food, upcycle food, feed animals, leave food unharvested, use anaerobic digestion with beneficial use of digestate or biosolids, compost, use anaerobic digestion without beneficial use of digestate or biosolids, or apply food waste to the land. Sending food waste down the drain, landfilling, and incineration are a last resort and to be avoided.

Heavy rain and flooding in Grand Rapids have the potential to damage home and community gardens in exposed areas. However, since no entity tracks or monitors community gardens in Grand Rapids or Kent County, [3] it is not possible to determine if gardens are located in flood-prone locations without additional outreach and data collection. Rising temperatures and changing seasonal conditions can make gardening more challenging and lead to harvest loss.

Figure 15: Environmental Protection Agency's (EPA) Wasted Food Scale

Climate change and extreme weather events regionally or even in other parts of the world could increase the cost of food and cause supply shortages and disruptions in Grand Rapids. According to the 2019 Michigan Hazard Analysis, a substantial portion (one-third) of Michigan's recent agricultural disaster declarations have involved drought impacts. [32] How this vulnerability will manifest outside of urban agriculture farms, community gardens, and home gardens is often in supply chain disruptions a hazard priority for the City of Grand Rapids in the Regional Hazard Mitigation Plan.

Equity & Health Impact

When asked in the CAAP Round 1 Survey how climate change will impact you the highest concerns around the food system included higher food costs, access to food, and damage to crops.

The affordability of food and prices at grocery stores rose to the forefront of the 2024 election as a key indicator of the health of the economy and discontent with inflation. Higher food costs can impact the decision and ability to consistently eat a healthy diet with poor access to affordable healthy food items are associated with high rates of cardiovascular disease. [26]

A variety of root causes, including systemic discrimination and legacies of neighborhood segregation, contribute to lack of access to healthy food in some parts of Grand Rapids. These areas are concentrated in places where residents of color and those with lower incomes reside. A 2019 study found that Neighborhoods of Focus had the highest populations with limited access to healthy food. [3] Households with children and Black households are disproportionately likely to receive SNAP benefits in Kent County. [27]

The ability to physically access land and food is a key component in food security. 29 of 128 census tracts in Kent County are low vehicle access with limited public transit options, especially in outlying cities and towns, the built environment can hinder residents' food access. [33] However, if an increase in local healthy food options occurs within NOF a potential harm could be an increase in gentrification. To address this potential harm anti-displacement measures must be pursued in tandem with food access solutions. Physical accessibility to land for communities of color to increase access to healthy and culturally relevant food is also a key equity consideration.

Changing seasonal conditions are altering growing seasons have the potential to damage crops. As Grand Rapids USDA hardiness zones change urban gardening and agricultural areas that serve Grand Rapids could be impacted.

Lastly, reducing food waste in Grand Rapids can be cost prohibitive. The City of Grand Rapids offers residents a free drop-off site for their yard waste to drop-off leaves, brush, and tree branches at 2001 Butterworth SW year-round. However, at this time the only food scrap composting options are external companies with fee-based services or to compost on personal property following current zoning regulations (fully enclosed compost bin, etc.).

A Changing Climate

"It is hard to know when to plant vegetables or cover crops, or if an early warm up and subsequent frost will kill this year's fruit crop. I also worry about the seasonal adaptations of fish and wildlife that I love, and whether our ecosystems will be able to weather the change. I try to reduce my emissions and impact in every aspect of my life: from transportation to diet. While my well-being is still insulated from the main effects of climate change, it still affects much of my day-to-day."

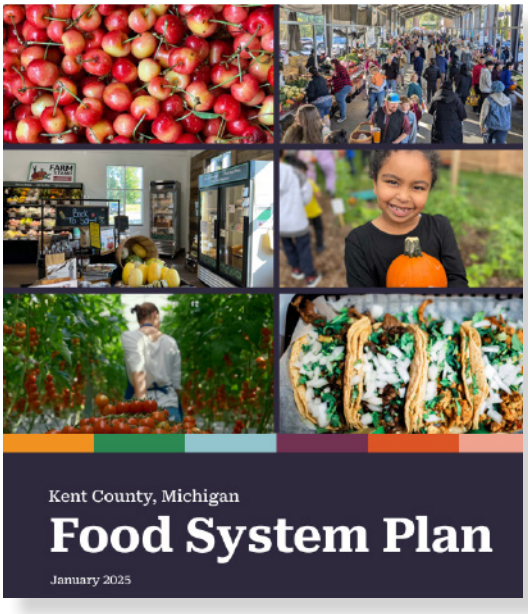
– CAAP Survey Respondent, January 2024

What's Happening Now & Barriers

While most of Grand Rapids' food supply is not grown within city limits, Kent County is a large producer of fruit and other items and interest in local food is growing. For the CAAP, "local food" will be defined as food grown or raised within a 100-mile radius of the city of Grand Rapids, with Kent County growers being prioritized. The region has a large food manufacturing presence, with food suppliers Meijer and SpartanNash based in West Michigan. Grand Rapids has a thriving community dedicated to food justice and circular economy, including but not limited to the Kent County Food Policy Council, Jade Rabbit, New City Neighbors, Blandford Nature

Center, West Michigan Sustainable Business Forum, Kent County's Department of Public Works, the City's Department of Public Works and Wormies. However, the food supply remains vulnerable to supply chain disruptions locally and in other areas and states, as was evident in disruptions and shortages during the COVID-19 pandemic. Climate hazards contribute to crop damage and support the spread of pests (through warmer and wetter weather).

The Kent County Food Policy Council has worked to establish a unified space for food systems and acted as the City's key partner for the CAAP with many of the strategies and actions echoing the information found in the Kent County Food System Assessment and Plan.



Many additional local organizations work to support food security, justice, and community agriculture in the Grand Rapids area, including Our Kitchen Table (OKT), Access of West Michigan, the Michigan Good Food Fund, along with many others. The City has worked to make community agriculture more accessible through policy changes and funding for urban gardens via the Neighborhood Match Fund. [34] The Kent County Food Assessment shows a concentration of food access locations, processing centers, and retail outlets in the city of Grand Rapids, [35] which indicates city residents would have better access to food during emergencies compared to surrounding areas in the county. However, the extent to which infrastructure and community services are prepared to handle these challenges is not known.

Some barriers identified from the Kent County Food Systems Assessment are:

- Retailers want to sell foods in abundance, which can lead consumers to over-purchasing and large portion sizes at restaurants
- Businesses are concerned about liability and brand protection when donating excess food.
- Composting infrastructure is limited and there are few options for businesses and community members to compost.
- Local food waste data for Kent County was very limited, showing a need for more data capture at the local and county levels.
- Uncertainty exists about the number of operational community gardens in Kent County. Approximately 25 community gardens exist, but there is no current tracking of community garden.
- BIPOC and new/beginning farmers are in need of support including access to capital, training, and resources. [35]

Planning & Funding Considerations

A photo of struvite from the WRRF Phosphorous Recovery System

The City continues to innovate and develop sustainable resources and beneficial byproducts at the Water Resource Recovery Facility (WRRF). In 2022, the City brought three biodigesters online, reducing solid waste to the landfill by 40%, and turned waste into revenue by creating renewable natural gas (RNG). In 2024, the WRRF Phosphorus Recovery system was finished, and the city is now producing tons of phosphorus struvite as a beneficial by-product. By capturing the struvite, the City reduces maintenance costs and is able to sell the product as a component to fertilizer offsetting costs. Other potential projects that have economic and climate benefits are being considered, including capturing CO_2 from the biodigesters for reuse, and implementing a BioSolid pyrolysis system to destroy PFAS/PFOS, further reducing the waste to landfill footprint. Barriers to continued innovation and development include funding, staffing, continued changes to the EPA, and finding appropriate feedstocks to increase RNG production.

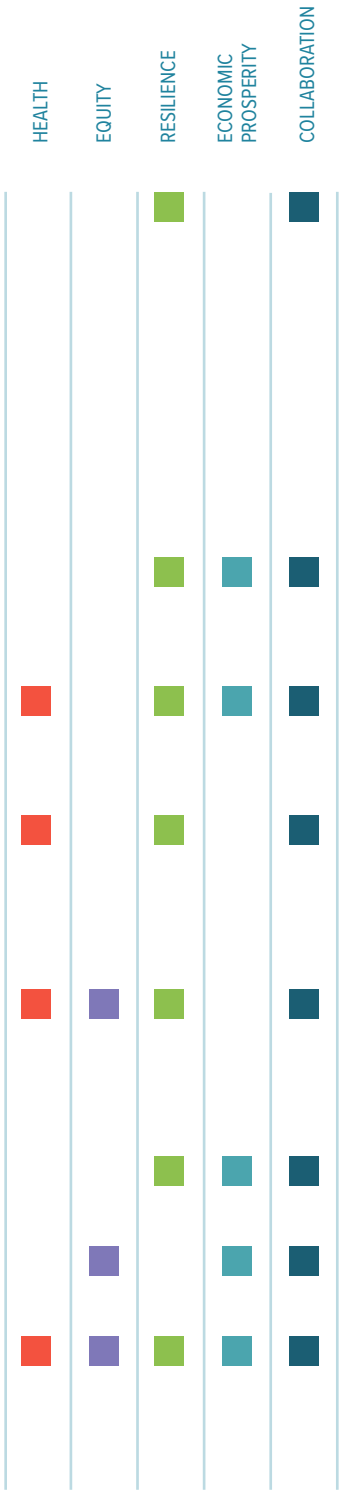
In 2019, Kent County's Waste to Energy (WTE) facility was counted as a "zero-emission" operation under federal laws contributing to low emissions from waste in the community GHG emissions inventory because all City of Grand Rapids trash must go to WTE. However, in November 2023, the state of Michigan passed new energy laws that change how and when WTE emissions are categorized. WTE facilities will no longer be considered "zero-emissions" in the future and the law requires WTE to shut down in 2039. Future GHG emission inventories will need to account for this, which will show an increase in future emissions. Anticipating a future increase in emissions care should be taken to incorporate waste reduction efforts into climate planning and actions. Increasing accessibility of food waste reduction opportunities to all businesses, organizations, and residents will be a key component to achieve reductions.

With a strong community support system established around food systems, collaboration with leading organizations to pursue funding will be essential to strengthen local food production, access and education in Grand Rapids.

Desired Future Impact

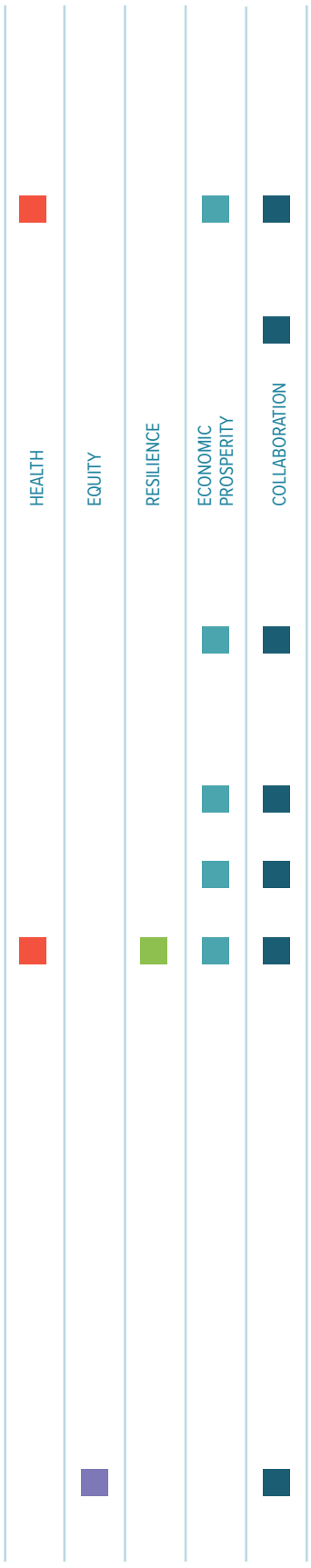
A good food system is characterized by the following conditions that support the economic, social, mental, and physical wellbeing of our communities: accessibility, equity, fairness, health, diversity and sustainability. In the future everyone can access and afford healthy, culturally appropriate food where they live, work, learn, and play. The food system will promote just and fair inclusion in a society in which all people can participate, prosper and make decisions to reach their full potential. People who plant, harvest, process, pack, transport, prepare, serve, and sell food have access to living wages, benefits, safe work environments, and pathways for career advancement.

The food system supports opportunities for everyone to be as healthy as possible, physically, mentally, socially and spiritually. Lastly, that the food system protects air, water, and soil now and for future generations. [28]



Strategy #1: Strengthen the local food economy to address food access and supply chain issues prioritizing access to neighborhoods of focus. [CMP 1.C.5]

- **Action 1:** Adopt the recommendations of the Urban Agriculture Committee to reduce barriers in the code to greenhouses and hoop houses to grow food within city limits, including: [CMP 1.C.6]
  - o Classify greenhouses and hoop houses, not as an accessory structure.
  - o Establish building material standards for greenhouses/hoop houses.
  - o Establish maximum size of greenhouses/hoop houses.
  - o Create a straightforward permit application process for greenhouses/ hoop houses.
- **Action 2:** Support educational programs that prepare youth for careers in agriculture and food businesses through collaborations with local organizations, schools, colleges, and universities.
- **Action 3:** Use the City's Neighborhood Match Fund to support the establishment of small food businesses, farmers markets, urban farm co-ops, and compost centers in Grand Rapids' neighborhoods.
- **Action 4:** Adopt local food purchasing preferences into city procurement policies using best practices from the Good Food Purchasing Program, prioritizing the purchase of local-grown foods (100-mile radius).
  - o Join the Good Food Purchasing Program.
- **Action 5**: Use city properties to support the promotion of local foods (e.g. continuing Parks & Recreation Urban Agriculture Community Garden program, seed banks at public libraries, farmers markets and food tree sales or giveaways in city parks).
- **Action 6:** Support farm and food business incubators and commercial kitchens for farms and food business owners to grow and scale their products.
- **Action 7:** Incentivize equitable business models like shared ownership, cooperatives, etc.
- **Action 8:** Promote marketing and education of local food suppliers across the city to encourage support for healthy local food systems.
  - o Celebrate "plant-centric" businesses and institutions for programs that reduce consumption of animal products.

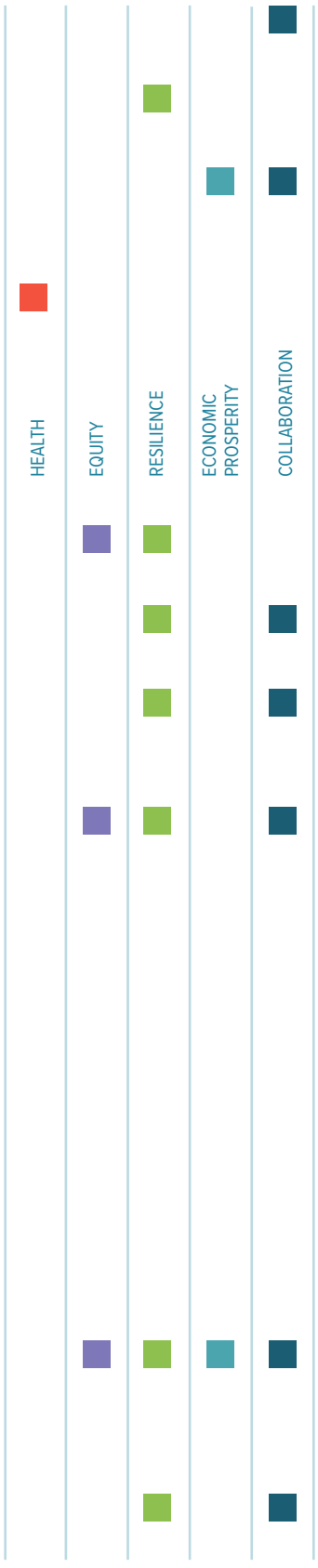


- Increase awareness of stores that accept federal program dollars to increase access for residents on income support and food assistance programs.
- Increase education of local food suppliers to local restaurants and retail businesses.

- **Action 9:** Review the zoning ordinance and consider amendments that reduce upfront development costs and encourage local neighborhood-based businesses that can address food access needs. [CMP 1.C.5]
- **Action 10:** Explore and support technical and design solutions for rooftop gardens.

Strategy #2: Reduce the amount of food and solid waste generated by public areas, businesses, and homes.

- **Action 1:** Adopt municipal public procurement and food waste policies that reduce waste at city facilities and events.
- **Action 2:** Explore financial incentives or discounts for events that produce less food waste.
  - Consider incentives/discounts for waste prevention, rescue, compost or all of the above.
- **Action 3:** Support programs that offer free or low-cost technical assistance on reducing food and solid waste to businesses, events, and organizations.
- **Action 4:** Encourage organizations and businesses with food services to conduct a food waste audit and develop a waste reduction plan.
- **Action 5:** Expand consumer education on food and solid waste, emphasizing:
  - The harms of waste and food waste including their connection to climate change.
  - Promotion of a circular economy, conscious consumerism and available recycling and reuse programs
  - How reducing food waste can save consumers money.
  - Strategies to reduce food waste, including through meal planning, cooking and storage techniques, and repurposing food scraps.
  - Interpreting quality-based and safety-based date labels on food (e.g., "best by," "sell by," and "use by").
  - Reliable methods for determining whether food is safe to consume.
- **Action 6:** Advocate for state and county policies that regulate or prohibit food waste in landfills.
- **Action 7:** Collaborate with community partners to develop a food rescue resource guide for food businesses and events that can be distributed through special events and economic development offices.



- **Action 8:** Develop a Citywide strategy in partnership with the business community to reduce process emissions from food service operations.
- **Action 9:** Pursue a pilot program to utilize food scrap, mulch, and wood waste in the creation of compost soil and bio-char.
- **Action 10:** Continue to collaborate with Kent County and surrounding communities to identify cost-effective solutions to processing organics (food and other compostable products) and recyclable materials.
- **Action 11:** Advocate for the repeal of state policy banning local control of plastic bag bans.

Strategy #3: Increase access to composting services and provide resources for residential composting.

- **Action 1:** Review ordinance language and identify opportunities to reduce barriers to composting.
- **Action 2:** Increase awareness of existing composting services, such as conducting outreach to restaurants, caterers, and farmers.
- **Action 3:** Increase the availability and efficiency of composting infrastructure (e.g., expanding Source-Separated Organics drop-off sites, processing facilities, and programs).
- **Action 4:** Increase public access to composting services through:
  - Establishing neighborhood compost sites and drop-off locations through partnerships with local organizations and community gardens.
  - Establishing an education campaign to teach how to compost and prevent contamination.
  - Identify ways to install compost bins next to trash and recycling bins in public spaces that minimize contamination (e.g, ,In business districts, food courts and food halls, farmers markets, and areas with a high density of mobile food vendors).
  - Identify opportunities to increase equitable access to composting.
  - Explore the practicality of a curbside composting program and incentives for composting.
- **Action 5:** Support residential composting by increasing awareness of existing compost education programs, expanding residential composting education opportunities, and helping with the cost of residential composting supplies.
- **Action 6:** Advocate for school-based composting and vermicomposting programs and incorporating composting education in schools.

HEALTH	EQUITY	RESILIENCE	ECONOMIC PROSPERITY	COLLABORATION

Strategy #4: Create and promote opportunities for people to learn about, grow, prepare, and share their own food.

- **Action 1:** Pursue recommendations of the Urban Agriculture Committee to reduce barriers to backyard livestock and edible trees and shrubs, including:
  - Create a permit process for backyard livestock similar to the chicken permit process. Specify which animals are permitted or prohibited based on health & safety standards for residents and animal rights for enough space. Establish defined number of animals permitted by right, noise/hygiene, enclosure/lot line regulations and slaughter regulations etc.
  - Add edible trees and shrubs to the approved street tree list for city plantings with approved maintenance plans.
  - Require that 10 percent of any plantings be edibles, preferably edible perennials, within required Parks and Open Spaces (as defined by the Community Master Plan).
  - Create signage for edible trees to eliminate stigma and encourage picking.
- **Action 2:** Increase access to safe spaces to grow food, such as community gardens with healthy, uncontaminated soil. [CMP 1.C.6]
  - Expand building community gardens in public parks.
  - Evaluate a pilot for neighborhood greenhouses with priority provided to Black and Brown farmers.

HEALTH
EQUITY
RESILIENCE
ECONOMIC PROSPERITY
COLLABORATION

- **Action 3:** Expand and promote opportunities to learn skills that support food literacy, such as basic gardening, farming, pest management, cooking, canning/fermentation, and meal planning skills, and access to relevant resources and supplies.

Strategy #5: Build and design our community to improve accessibility to healthy foods throughout the community, but with a focus on low income and disadvantaged neighborhoods.

- **Action 1:** Expand sidewalks and public transportation stops at grocery/ neighborhood stores.
- **Action 2:** Increase public transportation options to food access sites.
- **Action 3:** Create healthy food density regulations and tie housing development to affordable food access.
- **Action 4:** Increase the number of food access points in low-income, low-access neighborhoods by utilizing existing infrastructure or empty publicly owned-spaces.
- **Action 5:** Incentivize neighborhood stores to stock fresh, healthy food options.
- **Action 6:** Evaluate food access when developing housing and transportation plans and identify ways the new plans can support food access or increase access to places to grow, procure, and trade food.
    - Build on food access study to determine best accessibility practices to guide accountability for food access (e.g., 10-minute walk to a grocery store).

Next Steps

Implementation

Establishing the Climate Action & Adaptation Plan is the first step on the road to climate action. Implementing the CAAP will be a community-wide effort to reach the community-wide science-based targets by 2030.

The next phase of this work for the City will be:

Implementation Prioritization: August 2025 – February 2026

1. Releasing a request for proposal to hire (and hire) a consultant to calculate potential GHG emission reduction and cost of each strategy and action.
2. Determine lead and supporting departments for strategies and actions.
3. While the City can act as a convener, not all strategies and actions are able to be accomplished with only City staff. Having conversations with outside community organizations, businesses and residents to identify other leads and supporting partners we need at the table to accomplish strategies and actions will be key.
4. Prioritize strategies and actions in the plan into short-, medium- and long-term phases of work.
5. Create a public online hub for the Plan for residents to check in on the status of the work, measure progress, and provide transparent reporting and accountability.

While Implementation Prioritization is underway the City will begin working on immediate actions already on the horizon and seek to pursue additional funding opportunities.

A Just Climate Future

"Our community is uniquely equipped to collaborate to lead on initiatives which will reverse the direction we are headed with increasing temperature and the effect it will have on health, living standards, and healthy standards.
A sustainable Grand Rapids will be a place where people will be proud of the way we work together with respect and ingenuity to make Grand Rapids have clean air, safe water, healthy foods and plenty of green space to enjoy the beauty of West Michigan."

– CAAP Survey Respondent, April 2023

Updating

The City will update the plan once the implementation prioritization is complete. In conjunction with starting implementation more detailed work plans will be developed for each of the actions as soon as additional capacity and resources allow. The City is committed to evaluating the Climate Action & Adaptation Plan every five years in tandem with a new GHG emissions inventory.

Glossary

Adaptation: The process of adjusting to new and changing climate conditions in order to reduce risks to people and valued assets.

Biodiversity: Biological diversity in an environment as indicated by numbers of different species of plants and animals.

Biodigester: A closed system that biologically digests organic material, using microbes and other bacteria to produce Renewable Natural Gas as a byproduct.

Bioswales: Landscape topography designed to remove silt and pollution from surface and runoff water.

Climate Models: Models that simulate the physical, chemical, and biological processes that influence the climate system.

Climate Neutrality: The targeted reduction of greenhouse gas (GHG) emissions and GHG avoidance in government operations and across the community in all sectors to an absolute net-zero emission level at the latest by 2050.

Climate Projections: Outputs of climate models; A series of assumptions about the Earth system and future greenhouse gas emissions. Climate projections are not predictions for the future but should instead be considered as an approximation of the range of possible future conditions. This is why it is important to view these in terms of multi-year averages, ranges, and trends.

Climate Risk and Vulnerability Assessment: A local study of the ways in which a community is susceptible to the impacts of climate change.

Community Solar: A solar energy program that allows multiple individuals to share the benefits of a single solar energy system. This concept was developed to provide solar energy access to people who cannot install solar panels on their own property because they lack suitable roof space, live in rented or multi-family properties or cannot afford the upfront costs from a solar installation company. Participating in a community solar project allows individuals to access clean and renewable energy while receiving credits on their electricity bills.

Composting: Composting is the natural process of recycling organic matter, such as leaves and food scraps, into a valuable fertilizer that can enrich soil and plants.

Daylighting: The process of uncovering a buried stream or waterway and restoring it to the surface.

Energy Burden: The percentage of gross household income spent on energy cost (high energy burden is considered 6% or higher)

Fossil fuel: A GHG producing energy source formed in the Earth's crust from decayed organic material. Coal, crude oil, and natural gas are all considered fossil fuels because they were formed from the fossilized, buried remains of plants and animals that lived millions of years ago. Because of their origins, fossil fuels have a high carbon content. Coal has historically been burned in power plants for electricity and gasoline is a product of crude oil.

Food Security: a household's ability to access safe, sufficient, and nutritious food that meets their dietary needs at all times.

Geothermal energy: A form of renewable energy that comes from the internal heat of the Earth. It harnesses the heat stored in the subsurface to generate electricity or provide heating and hot water.

Green Banks: Green Banks are mission-driven institutions that use innovative financing to accelerate the transition to clean energy and fight climate change.

Green Infrastructure: Green infrastructure refers to systems or practices that use or mimic natural processes to infiltrate, reuse, or evapotranspirate stormwater on site.

Greenhouse Gases (GHG): The gases in the atmosphere that raise the surface temperature of the planet and absorb the wavelengths of radiation that the planet emits, resulting in the greenhouse effect.

Greenhouse Gas Inventory: A report that quantifies the amount of heat-trapping gases released by human sources within a defined boundary over the course of a year.

Heat Wave: A prolonged period of excessive heat often combined with excessive humidity.

Impervious Surfaces: A hard surface area which either prevents or delays the entry of water into the soil mantle as under natural conditions prior to development, and/or a hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Examples include paved concrete roads and roofs.

Invasive Species: Non-native species that disrupt ecosystems and replace native species.

Local Food System: growing, harvesting, gathering, selling, buying, processing, preparing, and eating food, as well as food waste, in our local community.

Mitigation: Reducing climate change – involves reducing the flow of heat-trapping greenhouse gases into the atmosphere, either by reducing sources of these gases (for example, the burning of fossil fuels for electricity, heat, or transport) or enhancing the "sinks" that accumulate and store these gases (such as the oceans, forests, and soil).

Native Plants: plants that have been growing in an area prior to European settlement.

Natural gas: A fossil energy source that formed deep beneath the earth's surface. Natural gas is composed of a combination of Methane, Ethane, Propane and Butane.

Neighborhoods of Focus (NOFs): City of Grand Rapids census tracts with the highest percentage of Black, Indigenous, and People of Color (BIPOC) residents and the greatest disparities across all quality-of-life indicators such as education, wealth, and employment.

Net Zero: The balance between the amount of greenhouse gas emissions (GHG) produced and the amount that's removed from the atmosphere. Balance can be achieved through a combination of emission reduction and emission removal.

On-bill financing: A program for property owners to pay for energy efficiency or renewable energy improvements through their monthly utility bill.

Per capita: The amount of greenhouse gas emissions (GHG) produced by an average person in a specific country or region, calculated by dividing total emissions by the population.

Property Assessed Clean Energy (PACE): An innovative financing tool for energy and water projects where businesses can eliminate the need for upfront capital and spread the costs over up to 25 years so that the savings generated from the project are greater than the annual PACE loan repayment – generating immediate positive cash flow.

Pollinator Habitat: An area with a variety of flowering plants that provide pollinators (such as bees, butterflies, bats, etc.) with needed food, water, shelter, and space to support nesting sites and robust populations. Pollinators are vital to flowering plant reproduction and most fruit and vegetable production.

Redlining: A discriminatory practice of restricting that consists of the systematic denial of services such as mortgages, insurance loans, and other financial services to residents of certain areas, based on their race or ethnicity.

Renewable Energy: Energy from fuel sources that restore themselves over short periods of time and do not diminish such as the sun, wind, moving water, and the Earth's core heat.

Renewable Energy Credits (RECs): Companies may purchase renewable energy credits along with their electricity, and the RECs certify that a certain amount of the electricity was from a renewable source.

Renewable Natural Gas (RNG): also known as biogas, a naturally occurring gas produced by the decomposition of organic matter, is captured and processed to remove impurities and increase its methane content to a level comparable to conventional fossil natural gas for usability. RNG is produced from various organic sources, including livestock waste, food waste, landfill gas, and wastewater sludge.

Resilience Hub: Community managed facility that support residents and coordinates resource distribution and services before, during, or after a natural hazard event.

Riparian Buffer: A zone of permanent vegetation immediately adjacent to a stream or other water body used to protect water quality.

Steam District: An underground network of piping delivers steam to supply thermal energy to 10 million square feet of building space in downtown Grand Rapids

Sustainability: Making decisions with the goal of achieving long-term net positive benefits that are informed by an understanding of how those decisions will impact climate resiliency and the environment, people and communities, and finances, both today and in the future.

Targeted Universalism: A process that includes setting universal goals, assessing how different groups in the community fare relative to the goals, addressing barriers, structural impediments, and resource deficiencies in a targeted manner in order for all groups to meet goals.

Tree Canopy: a measurement of the above-ground branches and foliage of trees that provide cover from the sun.

Tributary: a river or stream that flows into a larger river or lake.

Urban Heat Island Effect: An increase in temperature caused by the built environment of paved surfaces and closely packed buildings that amplify and trap heat.

Vital Streets: A Grand Rapids framework for designing a network of city streets and rights-of-way that are accessible, attractive, multimodal and safe; serving all people of our community, contributing to the livability of our neighborhoods and business districts, protecting the quality of our river, and increasing economic opportunity to individuals, businesses, and new development.

Voluntary Green Pricing: Voluntary Green Pricing (VGP) allows a customer to voluntarily specify a certain amount of electricity purchases to be from renewable energy resources

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“I moved to the Third Ward nine years ago and bought my home simply because of the ancient oak tree on the lot.

That might sound silly to you, but every day I am thankful to somebody I will never meet for planting that tree over 200 years ago. And every day I thank strangers who used to rent the property, and own the property, and steward the land before me for not chopping that tree down.

It brings so much joy to my neighbors, the children in my neighborhood; everybody who takes a walk by it says something about the tree.

And I hope that 50, 100, 200 years from now, people can look back and be thankful to the people in this room who decided to approve the Climate Action & Adaptation Plan. Thank you.”

– Comment at the Public Hearing for Climate Action, April 2025