

HENNEPIN COUNTY
MINNESOTA

 Climate Action Plan

DRAFT

Strategies to reduce greenhouse gas emissions and adapt to our changing climate in ways that reduce vulnerabilities and ensure a more equitable and resilient Hennepin County

February 2021

Draft version for public comment





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Purpose

The climate in Hennepin County is changing. Hennepin County's climate is getting wetter year-round and winter low temperatures are getting warmer. Climate vulnerability assessments make it clear that the risks posed to Hennepin County residents, infrastructure, and natural resources from climate change warrant a significant and coordinated response.

Through community engagement efforts, the county learned that residents, community partners, other units of government, and county operations have already been experiencing negative impacts due to climate change. Residents, community partners, and other units of government are advancing their own climate action strategies and are interested in working with the county to address the complexities of climate change. The county has an important role to play in protecting our most vulnerable residents, leading by example in our operations, and fostering partnerships to achieve shared goals.

Today, with our community in the midst of combating COVID-19, facing an uncertain economic outlook, and addressing the public health crisis of structural racism, it is more apparent than ever that building a more resilient community not only helps us adapt to a changing climate, but also helps us reduce racial disparities and safeguards our residents, economy, infrastructure, and environment. If we do not act boldly, climate change will progressively worsen the disparities in health, housing, and income that communities of color are already experiencing.

Our vision for a climate-friendly future

Acting boldly on climate change will enable us to create a better future for ourselves and generations to come. Pursuing the strategies laid out in this plan will make ourselves and our communities healthier. The buildings we live and work in will efficiently use the clean energy supplied to them, and we will have numerous sustainable and accessible options for getting where we need to go.

The lakes, rivers, forests, and prairies that make Hennepin County a great place to live will be protected and enhanced so that they provide habitat for a diversity of wildlife, give us a space to connect with nature, and contribute to making our communities more resilient. Transitioning to green, sustainable, and resilient infrastructure will provide economic opportunities that will be made accessible through workforce development and job training programs.

Engaging our communities and developing strong and diverse partnerships will make our strategies more creative, more ambitious, and more achievable. A focus on reducing disparities and protecting vulnerable residents will ensure these benefits are shared by all Hennepin County residents.



Foundation for an impactful response

Hennepin County's response to climate change is important. We lead in many areas that offer the most effective ways to cut greenhouse gas emissions, such as investing in transit, conserving energy use in our buildings, protecting natural resources, and preventing waste.

The county developed this climate action plan to serve as the foundation for a coordinated approach to planning, policy development, and responses to climate change. This plan both accounts for programs, services, and initiatives that are already underway and identifies new strategies that we need to pursue to effectively respond to and adapt to the changing climate.

The plan establishes how a climate response will be coordinated across lines of business and how reducing the impacts of climate change and creating a climate-friendly future will be integrated into the county's planning and decision-making. This is intended to be an iterative plan that integrates new and bolder goals and strategies as planning for climate change becomes core to how the county achieves its objectives.

This plan is an opportunity for the county to further our purpose-driven culture and innovate how we deliver service. We are well-equipped to meet this opportunity because responding to big challenges brings out the best in county staff – resourcefulness, innovation, and empowerment.

We cannot do it alone. We all have a shared responsibility – individuals, businesses, community organizations, institutions and government – to do more to combat climate change and protect our environment for future generations.



This climate action plan is a framework for how the county will pursue initiatives to reduce greenhouse gas emissions and strategies to adapt to the changing climate in ways that reduce vulnerabilities and ensure a more equitable and resilient Hennepin County.



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Our climate is changing and will continue to change ⁵

Climate change is caused primarily by the excess release of greenhouse gases, most notably carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄). Much of the excess greenhouse gas emissions come from human activities. When we burn fossil fuels for energy, we add more and more carbon dioxide and other greenhouse gases into the atmosphere. This buildup acts like a blanket that traps heat around the world, disrupting the climate.

According to Minnesota Department of Natural Resources Climatology Office, Minnesota's climate is already changing rapidly and will continue to do so for the foreseeable future¹. The variability in weather that Minnesota is known for between warm and cool and wet and dry will still be a staple of our climate, with projections showing that in some ways the climate will become more variable.

The region has gotten much wetter and warmer, driven by more frequent heavy precipitation and warmer winters (See Figure 1). In fact, the 2010s is the wettest decade on record in Minnesota, and projections indicate these trends will continue. Heavier precipitation events and warmer winters increase the frequency of flooding, landslides, freeze/thaw cycles, ice storms, rain on snow events, and heavy snowstorms. All of these put increased strain on county operations, residents, businesses, and the natural environment.

¹ https://www.dnr.state.mn.us/climate/climate_change_info/index.html

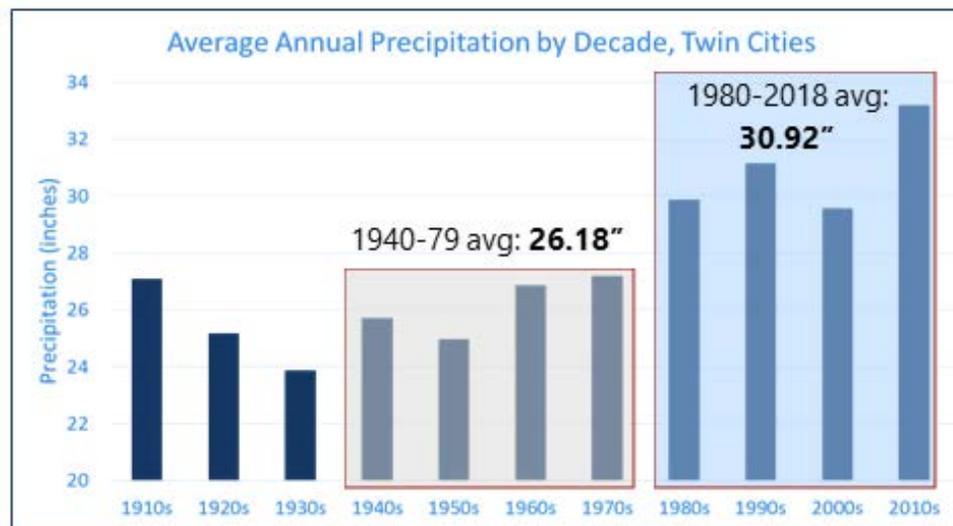


Figure 1: Average annual precipitation by decade in the Twin Cities

Source: Minnesota Department of Natural Resources, 2019

In addition to heavier precipitation events, the potential for drought will increase in the coming decades. Hot weather, including higher summer temperatures and heat waves, has not worsened yet, but it is expected to by mid-century.

One challenge we face in Hennepin County is that the dramatic images seen in the news of hurricanes, persistent droughts, wildfires, and urban heat waves don't match up with how we are currently experiencing climate change, so it can be harder for our staff, residents, and partner organizations to understand our local impacts. Thus far, impacts in Hennepin County have mostly been limited to small geographic areas, such as an intense rainfall inundating a portion of a city, creeping groundwater flooding affecting a small zone of residents, or landslides happening in specific areas. Additionally, the effects of extreme heat and extreme cold disproportionately impacts vulnerable populations, leaving the general public with an underappreciation of these climate change impacts.

Developing the climate action plan

Planning approach

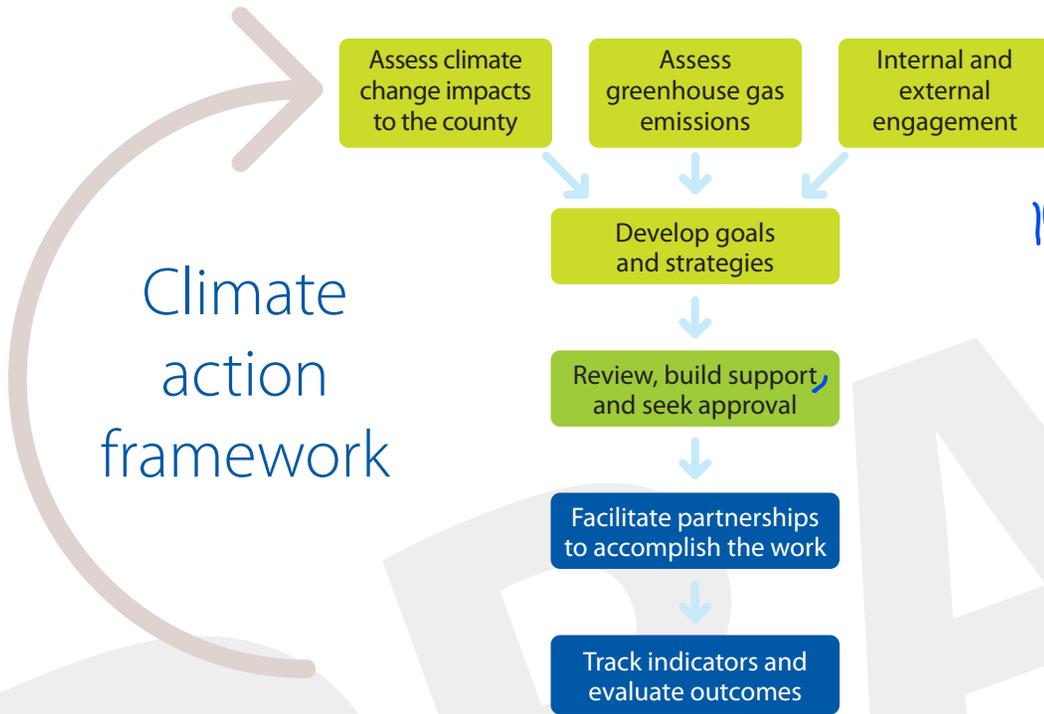


Figure 2: Climate action framework

The development of the climate action plan has followed the process depicted in Figure 2 with the following phases:

- 9 • Phase 1: Research and assessment on climate change impacts and greenhouse gas emissions
- Phase 2: Develop goals and strategies
- Phase 3: Review, build support, and seek approval
- 2020 and beyond: Seek and facilitate partnerships to accomplish the work

Internal and external engagement was conducted throughout the plan development. The county will track the metrics identified through the plan to evaluate whether the strategies in the plan achieve their desired outcomes. The arrow reflects the intention to make the plan iterative and adaptable as the county moves into implementation of the plan.

Phase I: Research and assessment

The first phase of the county's climate action plan development involved conducting research and assessing climate change impacts and greenhouse gas emissions. A summary of the key findings are described in the background section for each goal. The full reports are posted online at hennepin.us/climateaction.

In this phase, staff engaged Hennepin County's cities, watershed organizations, park districts, and other regional and state units of government to learn about their priorities for climate work and opportunities for collaboration. Staff also reached out to partner community groups that are working on climate change to gather feedback on the community engagement approach.

Phase II: Develop goals and strategies

Staff from every line of business were engaged in the following five work teams to develop goals and strategies to respond to climate change.



People: health, behavior, and disparity reduction



Transportation and infrastructure



Buildings and energy



Waste and materials



Water, natural resources, and land use

The teams proposed climate action strategies based on their focus area. The climate team leads then worked with Diversity, Equity, and Inclusion staff to apply a disparities reduction lens to the brainstormed strategies. In total, the teams came up with more than 200 strategies to address climate change.

The strategies were analyzed for similarities among the teams and categorized into themes. Finally, team leads were asked to consider the current landscape, taking into account financial realities, the county's core work functions, and their professional expertise in their focus area to recommend which strategies the county should pursue to build a strong foundation for an impactful response to climate change.

Seven foundational strategies were identified from that analysis. These strategies are staff's recommendation about the best place to start that will serve as a strong foundation for the county's long-term response to climate change. Those strategies were presented to the county board on

September 24, 2020. (See foundational strategies on pg 50).

Appendix A includes an acknowledgement of the 55 staff members representing 20 departments that participated in the teams.

Phase III: Review, build support, and seek approval

The county's approach to engagement began with internal coordination, then expanded to include public entity and community group partners, and then residents and businesses more broadly.

Early in 2020, staff reached out to county subject matter experts and senior leadership in all lines of business, asking for their commitment to this work and to consider how the county can best respond to climate change. For the county to succeed in an impactful response to climate change, this work needs to be a priority for all lines of business, not just work for environmental staff. Staff recognized that to achieve the desired outcomes in this plan, the county must commit to a long-term endeavor that requires significant changes to county policies, systems, and practices.

In May, staff reached out to Hennepin County's cities, watershed organizations, park districts, and other regional and state units of government to learn about their priorities for climate work and opportunities for collaboration.

In June, county commissioners reviewed the findings from the research and assessment phase of the work and provided feedback that helped shape the development of the strategies and informed the community engagement efforts.

Climate action plan

Cut greenhouse gas emissions

Adapt to climate hazards

Results in a more equitable and resilient Hennepin County

Vision for an impactful plan 18

This plan includes initiatives to reduce greenhouse gas emissions and strategies to adapt to the changing climate in ways that reduce vulnerabilities and ensure a more equitable and resilient Hennepin County. This plan serves as the foundation for a coordinated approach to planning, policy development, and responses to climate change.

The most important values to residents and community partners in creating a climate-friendly future are:

- Ensuring a healthy environment for future generations
- Protecting the most vulnerable people and reducing racial disparities
- Protecting wildlife and nature
- Responsibly using resources and minimizing wastefulness





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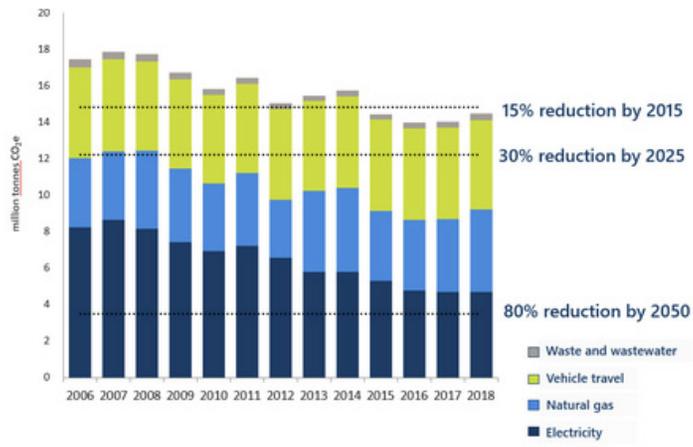
▼ Cut greenhouse gas emissions

In 2007, the Hennepin County Board of Commissioners adopted the Cool County Initiative (07-8-334R2), which called for the reduction of greenhouse gas emissions from both the geographic area of the county and from county operations from a 2005 baseline by:

- 15% by 2015
- 30% by 2025
- 80% by 2050

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Figure 3: Countywide greenhouse gas emission trends



As depicted in Figure 3, countywide greenhouse gas emissions have dropped by more than 15% from the 2005 baseline. The success in meeting the 2015 greenhouse emission reduction goal was largely due to Xcel Energy's efforts to expand renewable energy sources. Emissions relating to waste and wastewater treatment, transportation, and energy generation from natural gas have changed little over the past 12 years.

In addition to meeting the 2015 goal for countywide emissions, Hennepin County internal operations also achieved the 2015 goal of reducing greenhouse gas emissions from county sources by 15%. To meet that goal, the county implemented numerous energy conservation and efficiency measures, including using high-efficiency building design, recommissioning buildings, upgrading lighting, installing building controls, and changing operation and maintenance efforts to reduce the total amount of energy consumed.

▼ Adapt to climate hazards and prepare for the projected impacts

In May 2019, the county board directed (Resolution 19-0158R1 S1) staff to develop a coordinated resiliency and adaptation plan. **Climate adaptation** is about developing and implementing strategies to help human and natural systems cope with and become more resilient to the impacts of climate change.



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 Results in an equitable and resilient Hennepin County

The impacts of climate change will more acutely affect our most vulnerable residents. Like other environmental justice issues, data shows that communities of color, low income families, and residents with disabilities contribute least to the problem of climate pollution, but these residents are the most at risk from negative climate impacts. As the county seeks to protect the most vulnerable residents, we acknowledge that those who have the least capacity to respond to climate change will be most affected.

Resilience is the capacity of a community, individual, business, or natural environment to prevent, withstand, respond, and recover from acute shocks and stressors.

To understand how climate resiliency intersects with disparity reduction, the county modified a climate resiliency framework used by many



Figure 4: Climate resilience framework with a disparity reduction lens

organizations and added the green inner circle with the disparity reduction domains (See Figure 4). This helps to identify which areas of climate response and resiliency overlap with the disparity reduction domains.

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 The plan will result in building a more resilient community that can withstand and adapt to abrupt and sometimes unforeseen weather, social, and economic changes. The strategies pursued in this plan need to advance equitable outcomes and not exacerbate racial disparities.



Goal: Protect and engage people, especially vulnerable communities

The county strives to meet the needs of our residents by enhancing safety, health, and quality of life. As we serve today's residents, the county must also ensure a high quality of life for the generations to come.

The effects of climate change related to air pollution, flooding, and extreme heat will exacerbate health threats, especially for our most vulnerable populations.

The county must prioritize protecting the health of residents amid these increasing threats. At the same time, the investments the county makes in responding to climate change present the opportunity to reduce disparities in employment and grow the economy. To have a transformative impact, the county needs the support and engagement from residents, businesses, and organizations to advance collective action and drive systemic change.



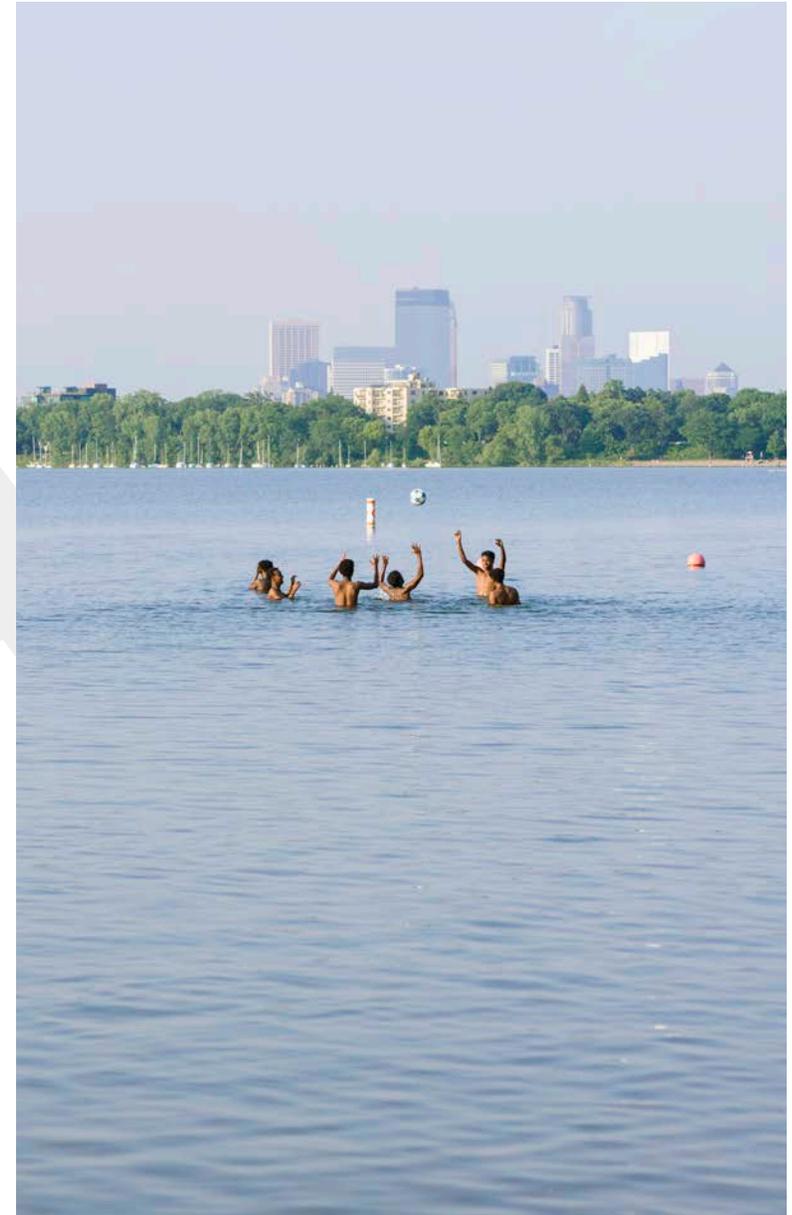


Goal: Protect and engage people, especially vulnerable communities

Health and livability impacts of climate change

Changes in our climate will result in changes to health and livability for our residents. The county anticipates preparing and responding to the following health and livability impacts:

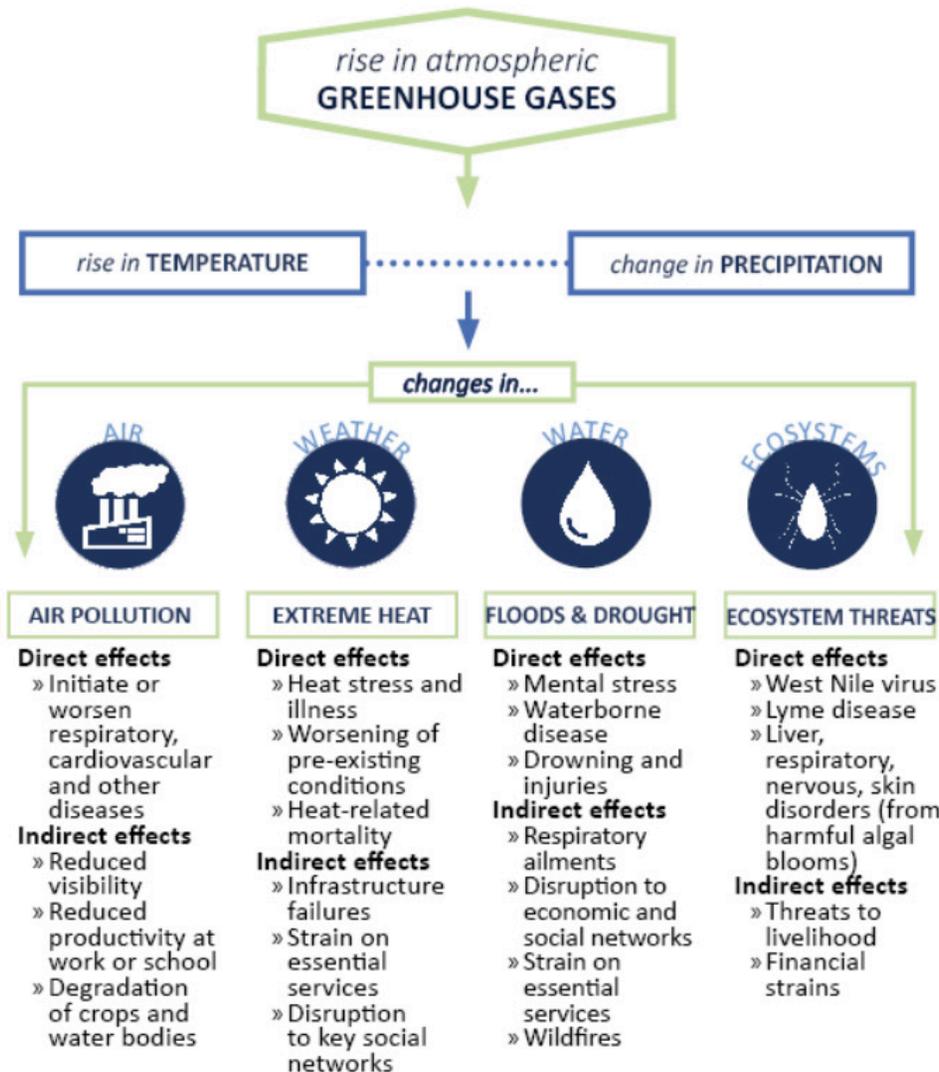
- Rising temperatures and changes in climate patterns are likely to increase air pollution. Air pollutants, such as ozone, particulate matter, and allergens, pose respiratory and cardiovascular threats.
- Increasing frequency and intensity of heavy rainfall events will lead to more flash flooding, which is a safety risk, especially for vulnerable residents. Flash flooding also threatens property and belongings and limits access for emergency vehicles to respond to calls.
- Sustained high precipitation will saturate soils and disproportionately impact residents living and working in areas prone to groundwater flooding. Buildings in persistently wet soils are more likely to grow mold and bacteria that reduce indoor air quality and pose respiratory threats to people in the buildings.
- Extreme heat, especially in urban areas, will put vulnerable residents at higher risk of overheating. Increasing temperatures combined with increases in precipitation will lead to increased humidity, compounding risks to residents with underlying health conditions.
- Transmission of West Nile Virus, Lyme disease, and other vector-borne disease is expected to increase as the distribution of ticks, mosquitoes, and other insects change as a result of warmer and wetter conditions.
- Negative mental health outcomes caused by the acute trauma of an extreme weather event or the gradual onset of climate change. Mental health issues may include anxiety, stress, depression, and post traumatic stress disorder.





Goal: Protect and engage people, especially vulnerable communities

Figure 5: Health effects of climate change.
Source: Minnesota Department of Health, 2016



Most common effects of climate change that residents have experienced over the last few years

(% of survey respondents who say they have experienced this effect)

- Stress or anxiety due to worrying about climate change and the future (74%)
- Changes in activities due to extreme, severe, or weird weather (55%)
- Increase in pests, such as ticks and mosquitoes (46%)
- Needing to deal with extreme heat or cold, including finding shelter and access to air conditioning (43%)
- Impacts on activities caused by poor air quality (40%)

Goal: Protect and engage people, especially vulnerable communities

Climate resilience

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Climate change is likely to bring more abrupt and challenging situations, such as flash floods or severe weather, that worsen existing disparities.



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A climate hazard, such as water in the basement, could be an inconvenience for some, a manageable problem for others, or a catastrophic event for those without the means to respond.

To illustrate this point, as winters have been warming, Hennepin County has seen an increase in winter rains. Rainwater flowing toward snow-covered stormwater intakes cannot infiltrate frozen soils and pools in the lowest spots. When winter rainwater flows into residential and commercial basements, the owner's and/or renter's financial ability to respond determines whether the damage is inconvenient, manageable, or catastrophic. The property of those without the financial means to repair the water damage may end up in tax forfeiture. Hennepin County is finding that many tax-forfeited properties have water damage, which the county repairs prior to reselling the property at market value.

Building a more resilient community – for example, at the individual level by providing financial assistance to help residents prevent or repair water damage and at the community level by increasing stormwater holding capacity in areas that are most prone to flooding – will help disrupt disparities and protect our society, economy, and public health.

 **Objective: Hennepin County becomes a more resilient community that can withstand and adapt to abrupt and sometimes unforeseen weather, social, and economic changes**

Strategy: Strengthen individual and community resilience

- Collect, monitor, and communicate climate risks to public health, society, and the economy.
- Foster relationships with communities to engage, listen, and respond with people-centered solutions.
- Improve education and communication to promote awareness, personal action, and best practices in the areas of:
 - Chronic disease prevention and management.
 - Vector-borne diseases.
 - Physical and mental health, wellbeing, and resiliency.
 - Environmental health, including indoor air quality, wet basements, and mold.
 - Weather, such as extreme heat or cold and severe storms, and subsequent health effects, including overheating, frost bite, and drowning.



Goal: Protect and engage people, especially vulnerable communities

Protecting vulnerable communities

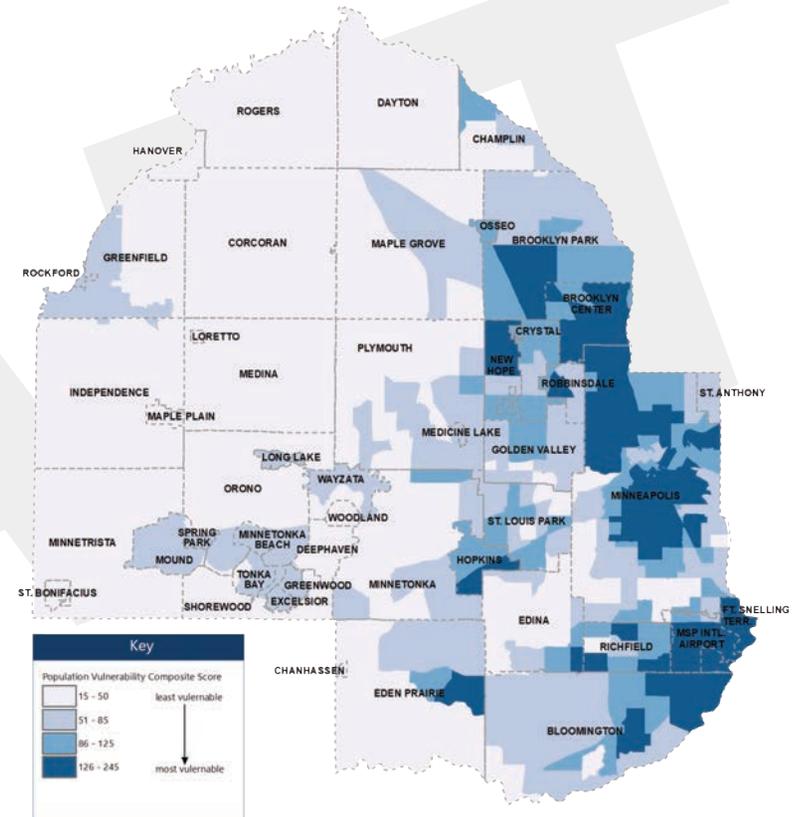


The impacts of climate change will more acutely affect our most vulnerable residents. Like other environmental justice issues, data show that our communities of color, low-income families, and residents with disabilities contribute least to the problem of climate pollution². Despite this, vulnerable residents are the most at risk from negative climate impacts, especially during flooding events, heat waves, and poor air quality days³.

As the county seeks to protect our most vulnerable residents, we acknowledge that those who have the least capacity to respond to climate change will be most affected.

The darkest blue areas on this map (Figure 5) are census tracts where people who will most acutely feel disproportionate impacts of climate change. This map was created by layering 14 datasets within six categories: race, income, language, ability, health, and social status. This approach is consistent with that used in other, similar analyses, such as Ramsey County Public Health’s vulnerability assessment, Met Council’s areas of concentrated poverty, MPCA’s Environmental Justice analysis, and CDC’s Human Vulnerability Index. Of note, this map mirrors both the county’s Historically Undercounted Communities map and the COVID-19 Equity Impact Awareness Tool maps recently created by Hennepin County GIS.

Figure 5: Human vulnerability index



² Minnesota Pollution Control Agency, Life and Breath: How Air Pollution Affects Public Health in the Twin Cities, July 2015.

³ Minnesota Department of Health, Minnesota Climate and Health Profile Report 2015.



Goal: Protect and engage people, especially vulnerable communities

 **Objective: The county's response to climate change prioritizes the protection of the most vulnerable residents and advances equitable health outcomes**

Strategy: Better understand and plan for the health needs of our diverse communities

- Improve collection of data and monitor the health impacts of climate change, including increased respiratory and cardiovascular disease burdens and particularly the impact on racial disparities.
- Strengthen sustainable access to affordable housing, healthcare, food, and transportation and other social determinates of health for residents.
- Create relationships with the communities in ways that strengthen engagement and build trust.
- Develop and include a climate analysis framework with a health and racial equity lens in budgets and planning work.
- Conduct outreach to vulnerable communities using customized and culturally appropriate approaches to meet diverse communities' needs.

 "Climate change is intersectional. Climate change burdens are racial/class discrimination burdens. It is all connected. Make space and time for those most impacted, along with experts. Talk to everyday people from all walks of life."

– Resident comment

Strategy: Mitigate disproportionate impacts associated with climate change

- Mitigate the heat island effect, especially in areas with people most vulnerable to extreme heat, by supporting increased access to air conditioning, increasing the tree canopy, and converting hardscape where possible to green infrastructure.
- Address flooding in housing, especially where people most vulnerable to flooding impacts live, by promoting and providing financial support for preventative measures such as sump-pumps and landscaping to redirect water away from structures.
- Build awareness of expanding flood zones among at-risk residents and businesses and the potential availability of optional flood insurance. Explore options for possible subsidized flood insurance based on financial need.
- Reduce air pollution associated with transportation, especially in areas with vulnerable populations.
- Reduce the health impacts associated with pollution from the production, packaging, use, and disposal of materials by supporting waste prevention, reuse, recycling, toxicity reduction, and the proper management of hazardous waste.



Racism as a public health crisis

The reality is that persistent disparities separate people who are not thriving in Hennepin County from those who are.

Although everyone will be impacted by the climate crisis, it will not be experienced equally. Like other environmental justice issues, those who least contribute to the problem of climate change will be most impacted. In this climate action plan, the county recognizes our obligation to work toward eliminating disparities in our response to climate change.

In June 2020, the Hennepin County Board passed a resolution declaring racism as a public health crisis that affects the entire county. This declaration supports the county's foundational work to develop strategies that mitigate personal bias and prejudice in the community, create systems that build equity, and create a future where all residents are healthy and successful and all communities thrive.

In Hennepin County, inequities in education, employment, health, housing, income, justice, and transportation are starkest between residents of color and their white counterparts. Acknowledging that this is both true and unacceptable is just the beginning. When we start our work from this shared perspective and shift our guiding lens to one that is focused and committed to addressing these disparities, we can see the places, partnerships, programs, and services where we have a responsibility to act. Hennepin County will support local, state, regional, and federal initiatives that advance efforts to dismantle systemic racism, will seek partnerships with local organizations that have a legacy and track record of confronting racism, and will promote community efforts to amplify issues of racism to engage actively and authentically with communities of color wherever they live.

– Excerpt from County's Administration's response to the board resolution declaring racism as a public health crisis





Goal: Protect and engage people, especially vulnerable communities



Inequitable climate impacts that affect health and wellbeing

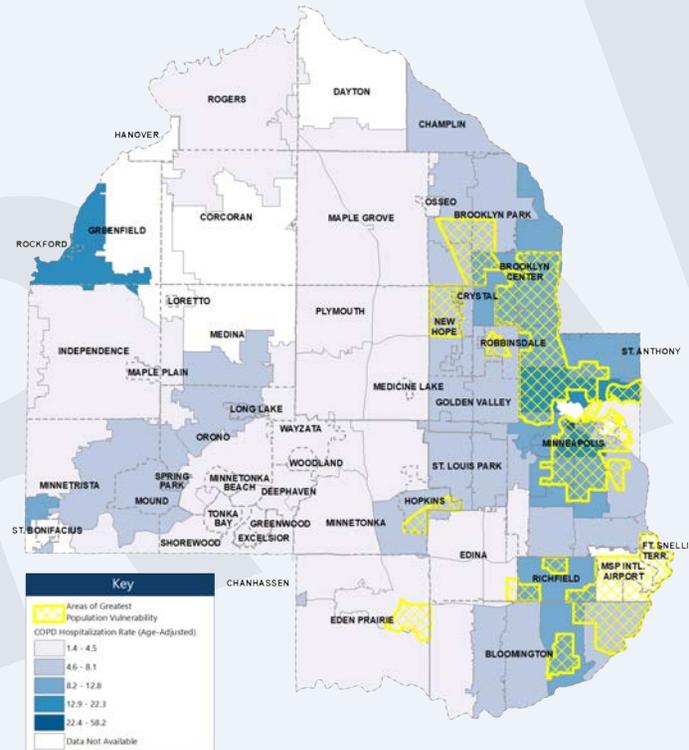
Air quality

Increased heat and precipitation associated with climate change is already causing adverse impacts on air quality that exacerbate many underlying health conditions by increasing stress on the body.

For example, rising humidity levels in combination with more frequent flood events from increased precipitation encourages greater mold and bacterial growth in buildings. In addition, rising temperatures and the lengthening of the growing season will expand the allergy season, disproportionately impacting residents with asthma and/or chronic obstructive pulmonary disease (COPD).

The following map (Figure 7) shows a significant association of COPD hospitalizations with the populations with the greatest vulnerability to climate change. Public health experts now use COPD hospitalizations rather than asthma hospitalizations because they more closely correlate with poor air quality.

Figure 7: COPD hospitalization rates



Health impacts of air pollution

Understanding the relationship between exposure to pollutants and disease is difficult because people move in and out of neighborhoods - they live, work, and are active in many settings. Some people are exposed to more air pollution than others because of where they live or work, and some people are more affected by it. For example, people with pre-existing heart and lung conditions are at greater risk, and so are the elderly and children. People of color, indigenous people, and people with low incomes face social, economic, and health inequities that often contribute to increased frequency of health conditions that can be affected by air pollution. These inequities mean that communities of color, indigenous communities, and lower-income communities tend to be more vulnerable to the effects of air pollution⁴.

⁴ The air we breathe. The state of Minnesota's air quality 2019 <https://www.pca.state.mn.us/sites/default/files/Iraq-1sy19.pdf>





Goal: Protect and engage people, especially vulnerable communities



Sources of greenhouse gas emissions and air pollution

Two-thirds of Hennepin County's greenhouse gas emissions come from the electricity and natural gas used to power industrial, commercial and residential buildings. Most of the remaining one-third comes from transportation emissions. The rest comes from the smaller, "neighborhood" sources such as backyard fires, auto-body shops, and dry cleaners.

Pollution from these emissions sources is higher in the parts of Hennepin County where our residents who are most vulnerable to climate change live because of the higher density of emissions sources. For example, with the exception of ground-level ozone, transportation-related air pollution is higher in the more urban areas of the county where the road network is densest and traffic is highest. This coincides with where many of the county's most vulnerable residents live.

Climate change impacts on air quality

While Hennepin County's air quality is generally good in terms of meeting federal air quality standards, projected climate trends will result in decreased air quality.

The Minnesota Pollution Control Agency maintains an Air Quality Index that categorizes air quality on a daily basis on a scale ranging from good to very unhealthy. Air quality has improved in recent years due to the increasing transition from coal-fired to natural-gas-fueled power plants, the expansion of solar- and wind-powered energy generation, more transit choices, and increased vehicle fuel economy standards.

However, unless significant mitigation efforts are undertaken, climate change will cause certain types of air pollution, such as particulates, ground-level ozone and others, to increase. This will have potentially significant consequences for our vulnerable residents.

One impact of climate change that Minnesota has not yet experienced is increased periods of drought, which is already occurring in other parts of the U.S. Droughts lead to the increased occurrence of wildfires, and smoke from these wildfires, especially those in western states and Canada, can adversely impact air quality in Hennepin County. During the summer of 2018, seven of the nine unhealthy air quality days in the metro area were the result of smoke from distant wildfires. Based on current projections, we can expect the number of unhealthy air quality days caused by distant wildfires to increase. In addition, if projections of periods of localized drought prove correct, nearby wildfires will also impact air quality.



Unhealthy air quality caused by Canadian wildfires. Photo: Minnesota Pollution Control Agency, 2015





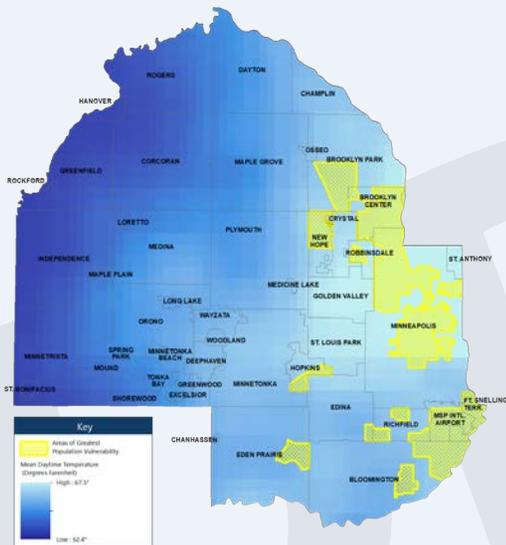
Goal: Protect and engage people, especially vulnerable communities



Extreme heat

Increased temperatures combined with increased humidity will disproportionately affect residents with underlying health conditions, especially those with limited means to adapt.

Figure 6: Heat Island – August Nighttime



Urban heat islands and vulnerable communities

Many urban areas have more concrete and other impermeable surfaces that radiate heat along with less tree canopy and greenspace to mitigate the heat. This creates urban heat islands where the temperature measured can be significantly higher than the official reported temperature. The continued rise of temperatures due to climate change is likely worsening this heat island effect.

Occurrences of daytime extreme heat are projected to increase by 2050. While a couple of degrees may not seem significant, increased temperatures combined with increased humidity will disproportionately affect residents with underlying health conditions, especially those with limited means to adapt.

Areas with those most vulnerable to the effects of extreme temperatures and the urban heat island are shown in the map (Figure 6). The map was developed using average August nighttime mean temperatures from August 2011 to August 2014, which was derived from a study by the University of Minnesota⁵, overlain with the areas of greatest population vulnerability. Nighttime temperatures are an important factor because our bodies are evolved to cool down at night. The inability for the body to cool off, especially at night, exacerbates physical and mental health stressors.

These data show that the urban heat island effect is stronger at night in the summer and during the day in the winter. Temperatures in the urban Twin Cities core averaged 2 degrees F higher than surrounding areas and spiked to as much as 9 degrees F higher than surrounding areas during a heat wave.

Additionally, a separate analysis by the University of Minnesota⁶ showed that the areas most impacted by the urban heat island effect align with areas where people who have historically faced housing discrimination live. More information about this analysis can be found online in the county's climate vulnerability assessment.

Access to cooling centers and other means to cool down

Many cooling centers are not open overnight or are not reasonably available to those in need. In addition, the COVID-19 pandemic has complicated the use of cooling centers, which results in very few cooling centers available in areas where the most vulnerable residents live.

Once again, the capacity to respond to increasing temperatures determines whether heat is an inconvenience, a manageable problem, or a catastrophic event. For many residents, higher temperatures may translate only to higher utility bills resulting from increased use of air conditioning, but some residents may not have air conditioners or the ability to pay to run them and are more likely to have underlying health conditions that make lack of access to air conditioning a bigger problem.

⁵ Smoliak, Brian. Dense Network Observations of the Twin Cities Canopy-Layer Urban Heat Island. JOURNAL OF APPLIED METEOROLOGY AND CLIMATOLOGY. Pgs 1899-1917. September, 2015.

⁶ University of Minnesota CREATE Lab, Islands in the Sky: Urban Heat Island and Redlining presentation, 2020.





Goal: Protect and engage people, especially vulnerable communities

Engaging the public

Climate change affects all parts of the county and all residents, businesses, and organizations. Transformative climate policies must be driven and supported by the public. To advance an impactful climate change response, we need to engage residents, listen to how climate change is impacting them, and collectively build support for solutions. Defining and articulating our collective vision for a climate friendly future is critical to motivate collective action.

 **Objective: Residents, businesses, and organizations pursue individual actions and support collective actions that drive systems change**

Strategy: Educate and engage the public in taking collective action

- Engage a broad range of stakeholders in understanding the impacts and developing solutions.
- Define and communicate the county's vision for a climate-friendly future, and work with residents and communities to articulate our collective vision for a climate-friendly future.
- Understand our residents' attitudes, barriers, and motivation toward taking action to address climate change and identify what different priority audiences need to take action.
- Develop effective programs, messages, and outreach efforts to support collective action.



2015 Naturefest event, hosted by Hennepin County, with Earle Brown Elementary at the Coon Rapids Dam Regional Park.



Goal: Protect and engage people, especially vulnerable communities

Green jobs

Several Hennepin County departments manage land and property for different purposes. New green infrastructure will help respond to projected changes in precipitation. Installing, establishing, and maintaining this infrastructure creates an opportunity to train a new green workforce, define new contract standards, or a combination of both. Hennepin County has developed several training models to achieve other county priorities. The right workforce model will help multiple departments manage projected precipitation and achieve broader county goals to reduce disparities in employment and income.



Objective: County climate investments support broader county goals to reduce disparities in employment and grow the economy

Strategy: Maximize green economic recovery and workforce development opportunities

- Explore a green jobs/pathways program concept for installation, establishment, and maintenance of green infrastructure.
- Engage with youth, especially in areas of greatest vulnerability, to increase awareness of climate change and mitigation strategies, highlight careers in the environmental field, and create a community-based network of environmental stewards.
- Support new job opportunities in energy efficiency, renewable energy, and green infrastructure.

Target metrics

- Include climate considerations in the development of the 2022 budget.
- Determine which data to collect and begin monitoring for the health and environmental impacts of climate change by 2022.
- Develop options for a coordinated green jobs/pathways program by 2022 to support county departments as they install and maintain green infrastructure.



Snapshot from youth listening session

What kinds of green jobs are most interesting to you?

Youth suggested providing green job training in schools. They expressed interest in jobs such as:

- Building solar panels and working in the renewable energy sector
- Planting urban gardens and supporting urban agriculture
- Construction jobs for energy efficiency and extreme weather resiliency
- Conducting outreach to schools
- Environmental consultant to companies
- Transit driver

Community engagement included a listening session held with high-school aged youth involved with community group partners.



Goal: Enhance public safety

The county's emergency management work includes preparing for, mitigating against, responding to, and recovering from disasters to ensure public safety and health. Hennepin County Emergency Management coordinates the countywide emergency management program, maintains public and private disaster resources in the county, and works to ensure that emergency officials, government, private industry, and volunteer organizations take a unified approach to preparing for and responding to emergencies. Within this framework, Public Health Emergency Preparedness coordinates the portion of preparedness, response, and recovery activities aimed at protecting the health of residents and staff.

The risk assessment process measures the vulnerabilities of communities, including loss of life, personal injury, property damage, and economic injury, resulting from hazard events. Hazards are triggered by natural processes, unintentional human causes, or intentional human threats. These triggers may also interact with each other to produce cascading impacts.

Detailed local hazard assessment information provides the framework to develop and prioritize mitigation strategies and plans to help reduce both the risk and vulnerability from future hazard events.

Reducing long-term risk

The most cost-effective disaster measures are mitigation actions that reduce or eliminate long-term risk to people and property from hazards. For every dollar invested in disaster mitigation, six dollars are saved in disaster response and recovery costs⁷.

Some of the climate-related hazards in the Hennepin County Hazard Mitigation Plan include extreme heat and cold, thunderstorms, extreme straight line winds (aka, "derecho"), tornadoes, winter storms, fires, flooding, power outages, infectious disease outbreaks, and geologic hazards, such as landslides or sinkholes. Mitigation efforts undertaken by communities will help to minimize loss of life, personal injury, and damages to buildings and infrastructure, such as water supplies, sewers, and utility transmission lines, as well as natural, cultural, and historic resources.



Aftermath of a tornado in Rogers, MN, 2008

⁷ National Institute of Building Sciences, "Natural Hazard Mitigation Saves", 2017



Goal: Enhance public safety

Impacts of flooding due to heavier rainfall

Risks posed by heavier rainfall events

Hennepin County is experiencing a significant increase in the number of 2-, 3- and even 4-inch rainfall events. More frequent, heavy rainfall events mean more flooding. Increased flooding events can put vulnerable residents at risk, endanger lives, destroy property and belongings, disrupt vital services, and hinder the ability of emergency response vehicles to respond to calls.

Varying ability to respond and recover

The ability of property owners and residents to respond and recover from flood impacts varies greatly. For some residents and businesses, flooding may be an inconvenience or a manageable problem. For others, such as a small business or a low-income family, flooding is potentially catastrophic. Beyond property damage, flooding also can lead to mold-related health impacts, waterborne diseases, and stress.

The increased need for flood insurance and protection

Until recently, those getting flood insurance were mostly property owners and residents in Federal Emergency Management Agency (FEMA)-designated floodplains. This led many people to believe that unless they were mandated to carry flood insurance, they were not at risk. But recently with the increasing frequency and intensity of heavy rainfall, nearly one-quarter of flood damage and one-third of flood recovery costs occur outside of the FEMA-designated floodplains, making it clear that wherever it can rain, it can also flood. This has led to an effort to increase flood insurance awareness and coverage in more areas.



*Hum's Liquors at the corner of 22nd & Lyndale flooded on July 16, 2019.
Photo by Jason Grote*



Goal: Enhance public safety

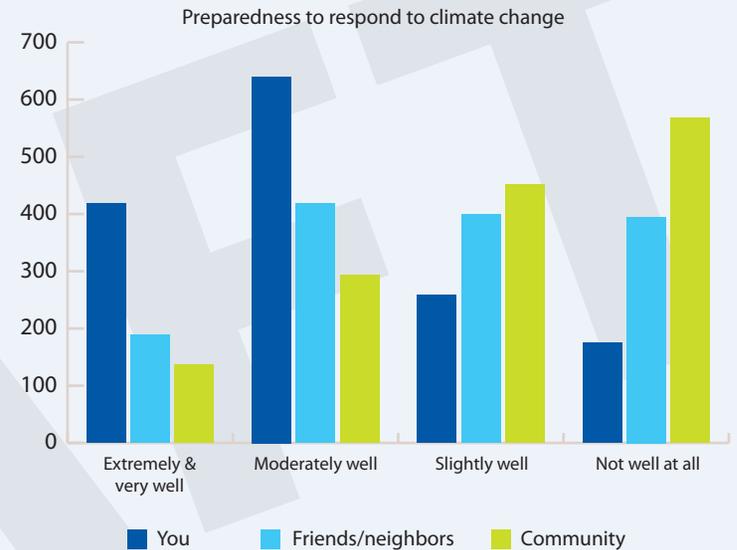
Objective: Hennepin County assesses, prepares for, and mitigates risks from hazard events

Strategy: Improve preparation for and response to extreme weather events, flooding, and other climate disasters

- Increase the density of the county’s network of automated weather and environmental monitoring stations (also known as the Hennepin West Mesonet) for improved warning and response decisions and increased ability to precisely target weather-related notifications.
- Collect data from recreational beach water to monitor disease rates and respond to outbreaks
- Identify areas at risk for all types of flooding, including flowing surface water (fluvial), standing surface water (pluvial) and subsurface water (groundwater flooding) and coordinate with public entity partners to create strategies for reducing risk, especially for vulnerable populations.
- Inform development by increasing risk awareness of areas of surface and groundwater flooding, landslides, and sinkholes. Work with cities to include these risks as part of their review of new development proposals.
- Work with residents and businesses to build awareness of flood risks outside of FEMA-designated flood zones.
- Regularly review continuity of operations plans to ensure delivery of core services and recovery after a disaster.
- Increase and maintain the supplies and equipment in the Hennepin Disaster Cache and elsewhere for emergency response to flooding and other increasing climate-related disasters.
- Improve natural disaster plans to include sustainable waste management practices to deal with the debris resulting from climate disasters.



Snapshot from resident survey



Most respondents think they are prepared to deal with and adapt to climate change. Two-thirds of respondents describe themselves as being extremely, very, or moderately well prepared. Only 10% noted they were not well prepared, and another 10% responded they didn't know. The perspective shifted when asked to assess how well prepared their friends and neighbors are, with only about 40% of respondents describing their friends and neighbors as being extremely, very, or moderately well prepared. Nearly 30% think their friends and neighbors are not well prepared. Perception of preparedness are even lower when respondents consider their community. Nearly 40% think their community is not well prepared to respond to climate change impacts.



Goal: Enhance public safety

 **Objective: Residents, businesses, and organizations understand and are prepared to respond to the impacts of climate change**

Strategy: Reduce risks to vulnerable people from extreme heat or cold

- Clearly communicate climate risks and vulnerabilities and raise awareness about programs and services available to decrease risks and address vulnerabilities.
- Coordinate operations of readily accessible and culturally appropriate cooling and heating options and communicate the availability of these centers to vulnerable people.
- Advocate for expanding utility disconnect protections to include air conditioning and modifying building codes to require efficient air conditioning.
- Educate residents on the importance of trees and mitigate the heat island effect by increasing the tree canopy and converting hardscape where possible to green infrastructure.



Target metrics

- Increase the county's network of automated weather and environmental monitoring stations (Hennepin West Mesonet) in areas most vulnerable to heat and flooding by 2022.
- Develop a mapping tool to comprehensively identify the sites most at risk for flooding of all types (fluvial, and pluvial, groundwater) to guide effective mitigation and response actions by 2022.
- Identify the structures and properties most at risk for flood damage in Hennepin County and take action that helps reduce or eliminate flood damages and disruption by 2025

Goal: Protect building sites, roads, infrastructure, and natural resources

Climate adaptation is about developing and implementing strategies to help human and natural systems cope with and become more resilient to the impacts of climate change. The county needs to plan for and respond to increased pressure on natural resources and infrastructure, such as the impacts of increased rainfall, extreme weather, and freeze/thaw cycles. There are also many opportunities to use green and natural infrastructure to manage stormwater, improve water quality, decrease the urban heat island, and sequester carbon. Protecting and enhancing our natural areas will provide habitat for native plants and wildlife, increase wellbeing, and make our communities more resilient.

Buildings and transportation infrastructure

Stormwater design standards

Hennepin County uses the national standard, Atlas-14 precipitation estimates⁸, to build resilient infrastructure. The dataset analyzes the historical frequency of heavy rainfall events through 2011. Transportation infrastructure is currently designed to handle a broad range of impacts based on historic climate records and familiar seasonal variations. Preparing for climate change and extreme weather events using projections of increased precipitation and heavier rainfall events is critical to protecting the integrity of the transportation system and the sound investment of taxpayer dollars.

While most county roads are kept passable with a stormwater pipe network, these pipes were designed to old precipitation projections and may not adequately keep roads passable given mid-century precipitation projections.

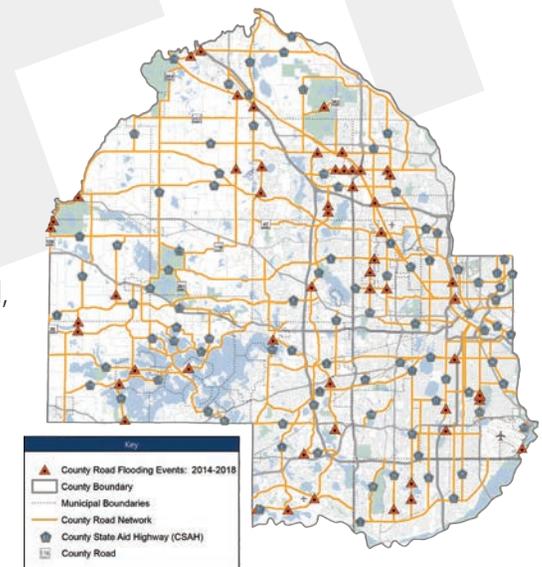
This map (Figure 9) depicts the locations where county roads were temporarily impassable due to flooding from 2014 to 2018.

The county is working to identify ways to estimate changes to projected rainfall, relative to current Atlas-14 estimates, to better understand how planning needs must change to ensure county transportation infrastructure is prepared to handle mid-century conditions.

Freeze/thaw cycles

Minnesota is experiencing warmer winters and an increase in freeze/thaw events, which negatively impact pavement systems. Generally speaking, more freeze/thaw cycles will accelerate infrastructure deterioration, especially for older pavements that already have many distresses and cracks in the surface and places where water will impact buildings, facades, sidewalks, and plazas.

Figure 9: County roads locations temporarily impassable due to flooding (2014-2018)



⁸ National Oceanic and Atmospheric Administration, Precipitation-Frequency Atlas of the U.S. Volume 8 https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14_Volume8.pdf

Goal: Protect building sites, roads, infrastructure, and natural resources

Objective: Climate risks and impacts to county buildings and infrastructure are assessed and mitigated

Strategy: Reassess policies, design standards, and maintenance practices for county buildings and infrastructure projects

- Update stormwater design standards that will serve as a standard across Hennepin County lines of business to account for increased rainfall intensities.
- Modify pavement and sidewalk design standards to accommodate projected changes to freeze/thaw cycles.
- Change snow and ice removal practices to account for increased precipitation intensity and increased icing due to increased freeze/thaw cycles, reduce total salt use on county property, and accommodate more multi-modal transportation options on county roads.
- Alter site development performance standards and design guidelines for rights-of-way and other county properties to reduce impervious surfaces and prioritize green infrastructure, such as trees, boulevard landscaping, tree trenches, and detention tactics. Adjust county policy to address long-term maintenance needs of green infrastructure assets.
- Design capital projects to projected mid-century rain events and incorporate landslide hazard reduction approaches, where applicable.
- Incentivize projects that are designed to control projected mid-century rainfall events in the cost participation policy for contribution to regional flood reduction projects.



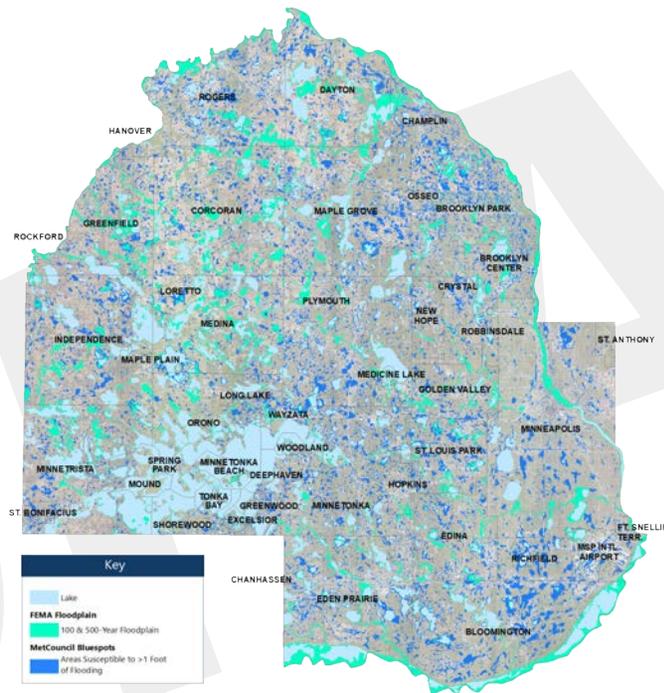
Goal: Protect building sites, roads, infrastructure, and natural resources

Increased stormwater and localized flooding

Surface water impacts are determined by how much and how quickly precipitation falls and by the ability of soils to infiltrate water or the capability of storm water conveyance systems to drain it away.

This map (Figure 8) depicts the location of 100-year and 500-year floodplains as mapped by FEMA. A 100-year flood is more accurately defined as a flood that has a 1% probability of occurring in any one year. Due to increasing precipitation, the 500-year floodplain is rapidly becoming the new 100-year floodplain. While many FEMA maps take into account storm sewer capacity and soil types, the mapping doesn't present a full picture because it doesn't consider localized flooding. The Minnesota Department of Natural Resources is working to update these maps locally.

Figure 8: Areas susceptible to flooding



The locations on the map in dark blue are identified by the Met Council as susceptible to localized flash flooding from high-intensity rainfall based on topography. In other words, these are low spots. This analysis was conducted, in part, to examine risks from localized flooding that FEMA mapping doesn't consider. This Met Council "Blue Spot" data does not consider the varying capacity of these locations to drain, either by the existence of stormwater drains or soil infiltration. However, most stormwater conveyance systems were designed based on outdated precipitation models.

Increased precipitation also increases groundwater recharge, which in many cases results in a rise in local water tables. This can create groundwater flooding, which is already occurring in several locations in Hennepin County. The increased flooding poses risks to numerous properties, many of which may not have flood insurance because they are located outside of the mapped 100-year floodplain. While the acute risks posed by surface flooding from heavy rains are potentially covered, the longer-term impacts of increased precipitation such as rising water table levels and the expansion of wetlands and shorelines can jeopardize local infrastructure, private wells and sewage treatment systems, cause flooded basements, and create water-quality impacts.

Goal: Protect building sites, roads, infrastructure, and natural resources

Objective: Risks and impacts from increased precipitation, flooding, and landslides are reduced

Strategy: Reassess policies and practices to manage increased stormwater volumes

- Design capital projects to manage flows from mid-century forecasted rainfalls.
- Protect and restore streams, wetlands, floodplains, and uplands.
- Reduce impervious surfaces, use green infrastructure, and reuse stormwater for irrigation and design landscapes that don't require irrigation.
- Reduce barriers to regional stormwater management by investing in partnerships, empowering staff to work beyond property line boundaries, and creating a policy for financial contributions to such projects.
- Preserve open space and agricultural lands and promote stormwater best management practices to landowners.



Localized urban street flooding, 2013

Strategy: Manage the increased risk of landslides due to increased rainfall

- Conduct further analysis to determine areas of risk, rank them in terms of severity, and develop solutions.

Strategy: Coordinate regional stormwater resiliency efforts with public entity partners

- Align land use, zoning, ordinances, and permitting activities with the realities of climate vulnerabilities and risks.
- Dedicate land at time of plat for climate change mitigation and stormwater facilities.
- Consider managed retreat in areas most vulnerable to flash flooding, such as finding opportunities with Hennepin County's tax-forfeited land portfolio, city economic development authorities, and local watersheds.
- Build stormwater facilities within county rights-of-way as part of capital improvement projects in opportunistic ways that share costs when achieving county, city, and watershed management goals.
- Protect drinking water by assessing vulnerability of wellhead protection areas and private wells to increased precipitation and flooding.
- Develop a groundwater plan that considers the impacts of climate change, including extreme weather events and wet/dry cycles, on groundwater resources and drinking water availability.

Goal: Protect building sites, roads, infrastructure, and natural resources

Green infrastructure

Green Infrastructure refers to ecological systems, both natural and engineered, that act as living infrastructure. Examples include rain gardens, bio-swales, and green roofs. These systems restore some of the natural processes required to manage water and create healthier urban environments. Building and maintaining green infrastructure to manage stormwater in flood-prone areas, especially on county-owned property, can protect surrounding properties, create green spaces, and make the community more resilient to climate change.



Stormwater from Target Field Station is captured in a bio-swale for treatment and infiltration. Excess stormwater is captured in cisterns and reused in the operations at HERC.

 **Objective: The county employs green and natural infrastructure, including trees, plants, and soil, to build resiliency, especially in areas at higher risks for localized flooding and extreme heat**

Strategy: Reassess policies and practices to ensure capacity to design, implement, and maintain green infrastructure

- Expand the use of sustainable landscapes to increase the resilience of county properties by managing stormwater onsite, reducing the impact of the urban heat island, and sequestering carbon.
- Minimize hardscape in project designs and convert existing hardscape, where practical, into pervious pavement or green infrastructure.
- Expand the urban forest canopy by preserving mature trees, planting more trees, and addressing barriers associated with maintenance.
- Assess all excess and tax-forfeited property for higher public uses, such as water infiltration basins or tree plantings, before considering for sale.
- Include green infrastructure in site development performance standards for county projects.
- Reduce the volume of and pollutant load in stormwater runoff through increased implementation of stormwater management best practices on current county building sites and rights-of-way.
- Set goals to maintain or increase tree canopy cover on each county property to mitigate for climate change, then execute a plan to plant and maintain trees to reach those goals.

Natural areas and agricultural lands

Hennepin County has an abundance of natural areas and diverse landscapes that provide critical habitat for wildlife, protect water quality, offer recreational opportunities, and serve as the foundation for the region's environmental wellbeing, economic prosperity, and collective quality of life. Climate change will further disrupt our ecosystems, which are already impacted by invasive species, population growth, and development. Healthy ecosystems play a vital role not only in the health of plants and animals, but of people, too.

Native wildlife and plants are extremely sensitive to climate change impacts. Warming lakes, rivers, streams, and wetlands and an increase in algae blooms impact fish habitat and recreation. Our tree canopy already faces many threats from pests, such as the invasive emerald ash borer, and climate change will only worsen those pressures by enabling more pests to survive. A warming climate is also changing the types of plants and trees that can thrive in our area, with northern species struggling while new species adapted to warmer climates start to take their place.

The trend toward a wetter climate has already added uncertainty and increased the challenge of producing food in a rapidly developing county. Working with residents to preserve open space and improve agricultural practices represent some of the best opportunities to sequester carbon, manage increased precipitation, connect habitats, and improve access to nutritious, locally produced food. However, the added business risks that climate change

poses to farmers will make it increasingly challenging to realize those benefits, and the incentives to develop open space will only increase. Without efforts focused on preserving agricultural land, the vibrant local and regional economy that agricultural activity supports will shift westward out of Hennepin County.

Changes in temperature and precipitation patterns will also disrupt the delicate balance of ecosystems and the species that depend on each other. Shifts in food availability, migration timing, and breeding seasons will impact the survival ability for many species. For example, a bird species may start to arrive earlier in the spring because the temperatures are already warm enough, but they may not have enough food to sustain themselves because the plants they rely on start growing in response to the amount of sunlight available, which is not changing.



Woodpecker activity on an ash tree infected with emerald ash borer

Goal: Protect building sites, roads, infrastructure, and natural resources

Objective: Natural areas and open spaces are functional and diverse

Strategy: Plan for and mitigate anticipated ecosystem and open space impacts

- Monitor for both aquatic and terrestrial invasive species by using early detection methods, such as community scientists, and implementing invasive species control programs that include rapid response protocols and employ integrated pest management on public and private property.
- Protect, restore, and connect natural areas, including streams, wetlands, floodplains, prairies, savannas, and forests, with a focus on supporting biodiversity and providing habitat for species that alter their range in response to climate change.
- Continue efforts to preserve natural areas through conservation easements.
- Create pathways for residents and partners to protect natural areas and other open spaces that should be preserved for the ecosystem services they provide, such as flood mitigation, stormwater retention and management, support for biodiversity, local food production, carbon sequestration, and recreation.
- Develop an Integrated Water Management Plan that considers findings from the groundwater plan, including vulnerabilities and/or areas of concern, with already established surface watershed management plans and land use management practices to develop a framework that protects vital aquatic ecosystems and source waters.



Wetland and tallgrass prairie restoration on a conservation easement in Independence

Goal: Protect building sites, roads, infrastructure, and natural resources

- Create and preserve affordable agricultural space for every scale of local food production – from conventional commodity agriculture to urban farming – and work with partners to encourage the development of farm-to-table efforts, focusing especially on increasing access to these programs in low-income communities.
- Promote best management practices on agricultural land with a focus on practices that create healthier soils with increased carbon storage and water holding capacity of soils while maintaining or improving long-term crop yields.
- Conduct education and outreach that helps current and future agricultural producers and their partners understand both the need for and financial benefit of building climate change resiliency into their farming operations and the agricultural economy.
- Work with other public agencies to address threats from climate change impacts to water quality more broadly so that actions to respond to climate change in one location do not exacerbate water quality degradation downstream.



Target metrics

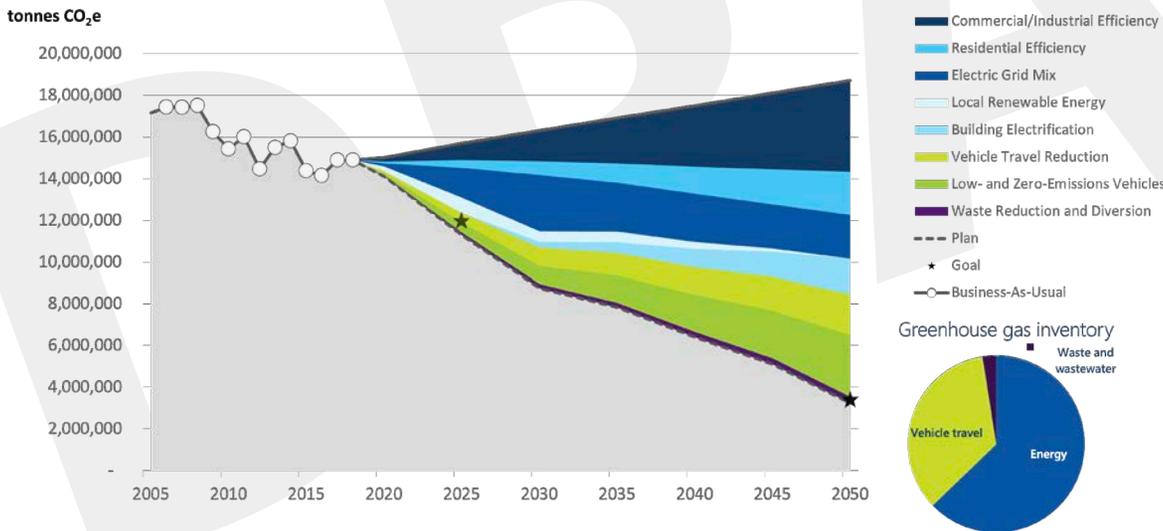
- Develop stormwater design standards for mid-century precipitation projections and develop policies and practices for green infrastructure to manage precipitation projections by mid-2021.
- Evaluate all existing building sites to maximize water retention considering projected mid-century rain event volumes by 2050.
- For new buildings, exceed runoff rates using projected mid-century rain event volumes instead of current Atlas 14 volumes, where feasible.

Goal: Reduce emissions in ways that align with core county functions and priorities

There is a path forward to meeting the county's greenhouse gas reduction goals. That was the finding from a scenario planning exercise staff conducted that generated the graphic below (Figure 10) using countywide greenhouse gas emissions.

Starting after 2020, the solid line across the top is a forecast of business-as-usual based on anticipated population and job growth out to 2050. The dotted line trending down to 2050 shows a scenario of how the county climate action plan can meet its 80% greenhouse gas reduction goal. The stars, at 2025 and 2050 show the emission reduction targets established by the county board.

Figure 10: Greenhouse gas emission reduction scenario planning



Components to meeting our greenhouse gas reduction goal

The colored wedges show what high-impact strategies will need to be pursued to reach these goals.

- The top five wedges in blue show the impact of strategies that address the energy slice of our greenhouse gas emissions – from increasing efficiency in commercial and residential energy use to transitioning to a carbon-free energy mix.
- The two wedges in green show the impacts from reducing vehicle travel and using clean cars.
- The purple wedge shows the impacts of reducing waste and avoiding disposal of waste in a landfills or waste-to-energy facilities. It is worth noting that disposal is responsible for a small percentage of the carbon footprint of most products. The biggest opportunity to reduce greenhouse gas emissions lies in the phases of production, distribution, and use, which are not accounted for in regional greenhouse gas inventories.



Goal: Reduce emissions in ways that align with core county functions and priorities

This analysis shows we can meet our greenhouse gas emission reduction goals, but only if we work in sync with our partners. On the energy side, the county has a role to play in leading by example and supporting the adoption of these efforts by local governments for broader impact. Because the county operates a transportation network and supports transit and transit-oriented development, we have an important role to play in reducing vehicle related emissions. Also, because of the county's statutory responsibilities to manage a solid waste management system, we can be impactful in reducing greenhouse gas emissions associated with material use and waste.



When the county's Public Works Facility was commissioned in 1997, it was the first building in Minnesota to use the sustainable building design standards.

Buildings and energy use

As a large organization, a major consumer of energy, and an energy generator, Hennepin County can have a significant impact through efforts to reduce energy use and improve energy efficiency in buildings. The county is well situated to lead by example in reducing energy use and associated emissions, as well as influencing energy planning, policies and regulations to lessen the impact on the environment, improve communities, and protect public health.

The greenhouse gas emissions associated with buildings are accounted for in two ways. The initial emissions from the construction and materials used are called embodied emissions. The remaining emissions are from the energy used to operate the building.

The county has a history of leading collaborative efforts to improve energy efficiency and sustainability of buildings. Recognizing the importance of energy efficiency in building design and operation, the county initiated a collaborative effort that resulted in the creation of the Minnesota Sustainable Design Guide in 1996. This guide was a precursor to the current Minnesota Sustainable Building Guidelines (B3 guidelines) that are now widely used by state and local agencies to meet sustainability goals for new building design and building renovations.

Other ways to avoid greenhouse gas emissions with buildings is by reusing buildings and building materials rather than building new and by using of a lifecycle analysis when designing new buildings. Some of the materials widely used in construction have the highest climate impacts, including cement, aluminum, steel, and plastics. Unlike operational carbon emissions, which can be reduced over time with building energy efficiency renovations and the use of renewable energy, embodied carbon emissions are locked in place as soon as a building is constructed. As new buildings become more energy efficient, the construction and material sourcing of the building will be a much larger component of the overall building carbon footprint.



Goal: Reduce emissions in ways that align with core county functions and priorities

 **Objective: Greenhouse gas emissions associated with buildings and energy use are reduced to meet the state's Next Generation Energy Act and county emission goals**

Strategy: Reduce climate impacts of buildings through innovative and efficient design, including the use of climate-friendly material choices

- Establish green building guidelines for county and regional adoption.
 - Use the B3 guidelines to measure and track the impacts of design features on all county capital improvement projects.
 - Use lifecycle analysis for selecting climate-friendly building materials and furnishings for all county facilities.
 - Prioritize renovation over building new.
 - Promote the design of all county buildings for adaptability and reuse.
 - Implement a sustainable purchasing policy, especially for the use of concrete and steel.
 - Implement procedures that require the salvage and recycling of construction and demolition waste at all county-funded building projects.
 - Work with cities to establish minimum energy performance targets for new construction and major renovations on both public and private properties.
- Reassess current development grants and explore new financial incentives to increase market transformation of climate-friendly buildings.

Strategy: Transition to renewable energy sources and reduce energy use overall in county operations

- Prioritize conservation, efficiency, and renewable energy in policies and programs.
- Invest in renewable energy through utility sources, community solar gardens, and onsite solar.
- Develop strategies to convert Hennepin County buildings from natural gas to electric fuel sources.
- Maximize centralized energy sources that incorporate renewable technologies.



Solar panels on the roof of Hennepin County Public Works Facility in Medina.



Goal: Reduce emissions in ways that align with core county functions and priorities

Strategy: Support Hennepin County communities in establishing initiatives to reduce greenhouse gas emissions associated with energy use

- Determine the approach and level to which the county encourages residential and commercial energy efficiency and renewable energy, focusing on:
 - Training contractors and building operators on new energy technology and efficient building construction and operation.
 - Supporting affordable adoption of renewable energy and conservation for energy consumers, including small businesses and low-income households.
 - Establishing and funding programs to promote equitable clean energy and efficient housing.
- Become more engaged in:
 - Developing benchmarks and strategies for the state Conservation Improvement Program (CIP), which is a program funded by ratepayers and administered by utilities that helps households and businesses use electricity and natural gas more efficiently.
 - Advancing a statewide Advanced Energy Standard (stretch code) for a building code that would require net zero buildings by 2036, along with other regional efforts.
- Encourage energy benchmarking of buildings and expand the Hennepin County Efficient Buildings Collaborative.
- Explore a uniform, county-level green building policy that cities could adopt, or advocate for B3/LEED standards and protocols above and beyond when state funding comes in for facilities and infrastructure.
- Engage with municipalities to develop strategies that encourage switching to a less carbon intense fuel source for commercial and residential buildings, such as electrification.



Energy benchmarking is the process of monitoring and reporting the energy use of a building. Some cities require large buildings to record their energy use each year. This allows for comparison of buildings' energy use to similar buildings or the buildings' past performance and helps pinpoint properties with efficiency issues. The county's Health Services Building is the top ranked public owned building in Minneapolis.

Target metrics

- Implement procedures that require the salvage and recycling of construction and demolition waste at all county-funded building projects by 2022.
- Use lifecycle analysis for selecting climate-friendly building materials and furnishings for all county facilities by 2023.
- Operational energy reduction target: 3% annual energy reduction through 2030.
- Develop a framework for a public sector, regional energy efficiency partnership by 2022.



Goal: Reduce emissions in ways that align with core county functions and priorities

Transportation



Hennepin County plans, funds, builds, and manages a transportation network of roadways, bikeways, and sidewalks. Long-term partnerships with the State of Minnesota, other metropolitan counties, cities, and park districts have produced an increasingly dense network of transit and transportation options that include light rail transit, bus rapid transit, commuter rail, bikeways, and pedestrian walkways.

Managing the land and infrastructure in this transportation network creates opportunities to reduce greenhouse gas emissions from vehicles, sequester carbon, manage increased precipitation, and reduce the impact of the urban heat island effect.

In 2019, vehicle travel produced 35% of all greenhouse gas emissions within the county. Emissions in the vehicle sector are influenced by three main factors:

1. Land use and community planning: Where people are located and where they go affects how often trips are made and how long those trips take.
2. Mode of transportation: Whether people are driving, walking, biking or taking transit.
3. Fuel choice and fuel efficiency: Which could include gasoline, diesel, biofuels, electricity, or human effort.

As our transportation system is evolving, reducing air emissions will not only help meet our greenhouse gas reduction goals, but also reduce disparities in traffic related health impacts..

Transportation emissions have declined slightly in the past decade despite an increase in vehicle miles traveled (VMT) due to increased transit options, higher fuel economy standards, and intelligent traffic systems that reduces congestion.

In response to the COVID-19 pandemic, many office workers have been sent to work at home for more than a year, including two-thirds of county employees. This has led many businesses, organizations, and individuals to reconsider the need to work in an office full time.

While it is too soon to tell the lasting effects of the pandemic, the greenhouse gas emissions scenario planning analysis (Figure 10) assumes an 8% emissions reduction due to a sustained increase in remote work. In addition, work being less tied to a centralized office space could reduce the necessity or appeal of living near the urban core, causing shifts in land use and community planning.

Goal: Reduce emissions in ways that align with core county functions and priorities

Inequitable climate impacts: Air pollution from transportation

Vehicles are a large source of air pollution. The map below (Figure 11) depicts a projection of air pollution from traffic based on average daily trip data⁹. As would be anticipated, transportation-related air pollution is higher in the more urban areas of the county where the road network is densest and traffic is highest. According to the Minnesota Pollution Control Agency, communities of color bear a disproportionate burden of traffic-related health impacts¹⁰.

Figure 11: Projection of air pollution from traffic based in average daily trips.



⁹ Minnesota Department of Health, Healthy Communities Count! Indicators of Community Health along the Central Corridor Light Rail Transit

¹⁰ Minnesota Pollution Control Agency, Life and breath: How air pollution affects health across Minnesota (2019)

 **Objective:** Greenhouse gas emissions associated with transportation are reduced to meet the state's The Next Generation Energy Act and county emission goals

Strategy: Reduce vehicle miles traveled in Hennepin County and throughout the region

- Advocate for the buildout of planned transit routes.
- Expand transit-oriented development and bicycle and pedestrian facilities.
- Advocate for strategies to reduce travel demand, such as expanding park-and-ride lots and promoting flexible work schedules.
- Manage the road system to minimize pollution by leveraging additional technologies.
- Support increased and more efficient transit on county roadways in coordination with transportation partners.
- Operationalize opportunities to reduce vehicle miles traveled through transportation capital and maintenance projects and programs.

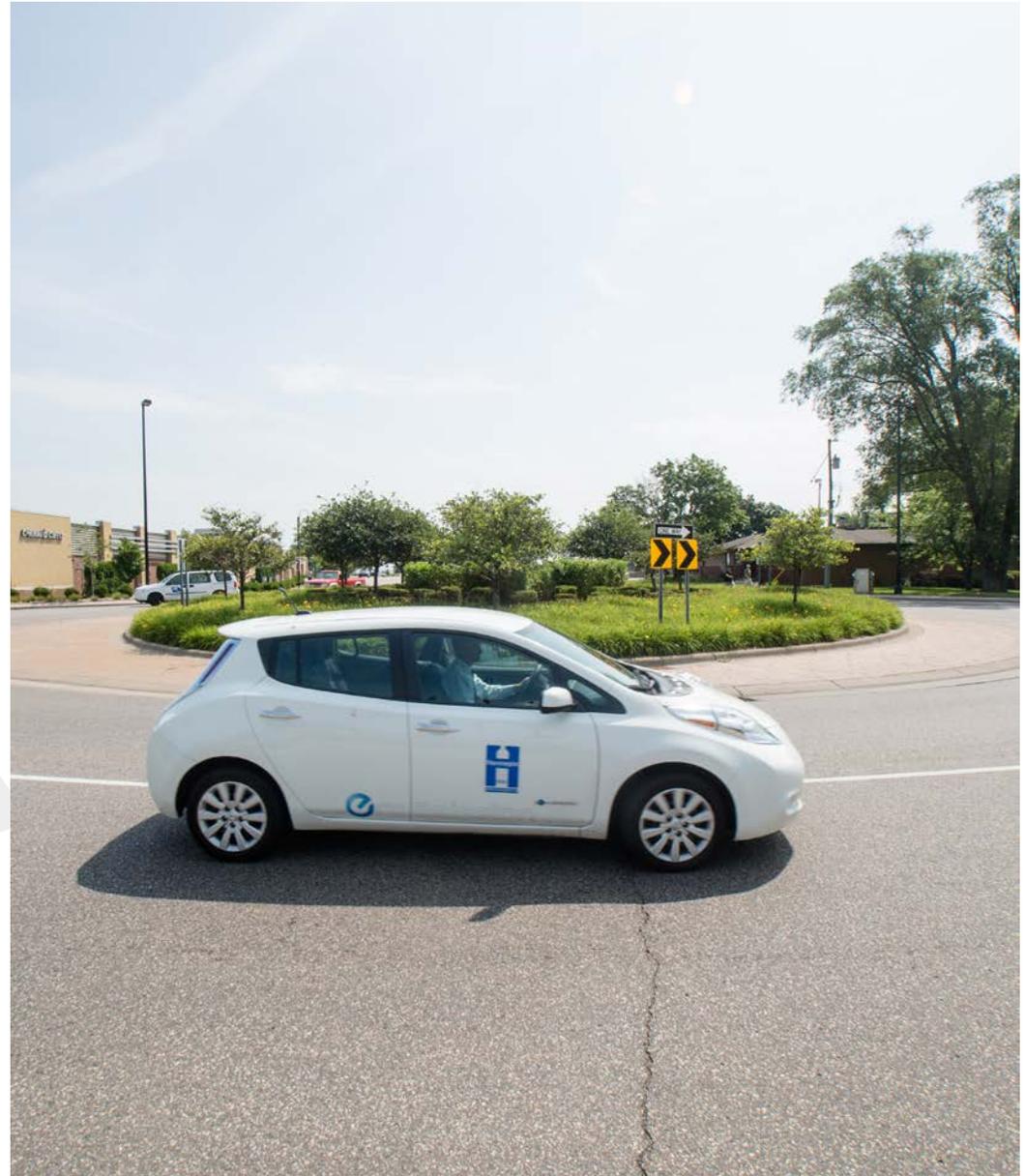




Goal: Reduce emissions in ways that align with core county functions and priorities

Strategy: Promote electric vehicle infrastructure regionally

- Engage with regional and statewide efforts to advance electric vehicles.
- Work with electrical utilities to install charging stations.
- Develop electric vehicle and infrastructure guidelines at county buildings.
- Assess existing county fleet vehicles and infrastructure for electrification opportunities and develop an electrification plan to guide the procurement of electric vehicles and charging station locations.
- Educate residents about proper vehicle maintenance and electric vehicle options, and support incentives for low-income residents, such as a scrappage incentive for vehicles in areas of higher air pollution or low-interest loans to income-qualified households, to increase participation.





Goal: Reduce emissions in ways that align with core county functions and priorities

Strategy: Use transportation investments to support broader county goals including reducing disparities, improving health, enhancing livability, and growing the economy

- Link transit, bicycle, pedestrian, and road projects to housing, jobs, and recreational opportunities.
- Prioritize vehicle emissions reductions strategies in areas with the residents experiencing high health burdens.
- Provide convenient, affordable access to destinations, especially for residents experiencing high transportation and housing cost burdens.
- Create healthy and livable communities by including pedestrian, bicycle, and transit facilities as well as green boulevards in roadway projects.
- Strengthen the connection between land use planning and transportation to promote orderly growth and development.

➤ “The biggest opportunities for county impact are transportation and housing, and particularly their intersection. County roads are responsible for a huge amount of transportation emissions. Reallocate capacity from cars to alternatives, such as public transit and biking. Housing sprawl in the exurbs are also responsible for a huge amount of transportation and energy emissions. Promote availability of higher-density housing options closer to the core metro area.”

– Resident comment



Photo of construction at RiZe at Opus Park Apartments along the Southwest LRT line in Minnetonka

Target metrics

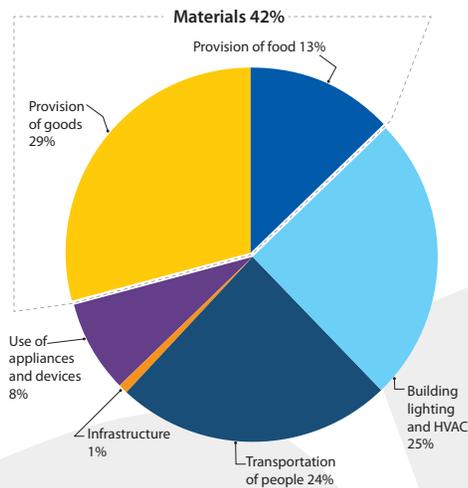
- Decrease vehicle miles traveled (VMT) to year 2000 levels (2.06 billion) by 2040.
- Decrease gas emissions from the county's fleet by 30% by the year 2030.
- Convert 20% of the county's light duty fleet vehicles to electric and 50% to hybrid by the year 2030.



Goal: Reduce emissions in ways that align with core county functions and priorities

Waste and material use

Figure 12: Systems-based greenhouse gas sources
Source U.S. EPA 2009



A traditional greenhouse gas inventory shows the emissions broken down by energy, transportation, and waste. Disposal is responsible for only a small percentage of the carbon footprint of most products. But if you regroup the emissions to show how they are tied to the production of materials and goods, you see that what we buy has a big impact on climate (Figure 12). Creating new products requires energy – to harvest raw material, process it, manufacture it, transport it, and sometimes, to use it. Producing and transporting goods is associated with 45% of global emissions. This

Additionally, climate action experts identify reducing food waste as one of the single most effective solutions to climate change, and the county has a lead role in waste management. Food has both upstream and downstream impacts, from the energy used to grow, transport, process, and refrigerate it to the methane generated when food waste is landfilled. Although methane made up only 10% of the total greenhouse gas emissions nationwide in 2018¹¹ it is 25 times more potent than carbon dioxide in terms of trapping solar radiation and exacerbating climate change. An estimated 17% of all methane emissions come from landfills. From waste sorts, we know that 20% of our trash is food. Preventing food waste and composting or digesting food scraps is the biggest opportunity for our residents and businesses to reduce waste.

underscores the importance of sustainable purchasing. Public entities have significant purchasing power, which provides an opportunity to make a positive impact on climate change through procurement decisions.

Materials widely used in construction, including cement, aluminum, steel, and plastics, have some of the highest climate impacts. Many building materials have the potential to be salvaged and reused or recycled. In fact, about 85% of the materials in a typical demolition project could be salvaged for reuse and kept out of landfills. But currently, only about 30% of building materials are reused or recycled.

Engaging and educating residents, businesses, institutions, and cities will be critical to both adapting to what lies ahead and taking action to reduce climate impacts. For materials and waste, this means engagement and education around the climate impacts of consumption and reducing the environmental impacts of waste.

¹¹ U.S. EPA <https://www.epa.gov/ghgemissions>



Goal: Reduce emissions in ways that align with core county functions and priorities

Objective: Greenhouse gas emissions associated with waste and material use are reduced to meet county goals

Strategy: Prevent food waste and divert organic material from the trash

- Support food rescue efforts to divert more food to people in need.
- Help businesses and organizations that produce a lot of food waste implement best practices for preventing food waste.
- Develop a consumer campaign on food waste prevention.
- Continue to support and fund residential and commercial organics recycling programs and implement business food waste recycling requirements and city residential organics recycling requirements.
- Develop organics recycling infrastructure by advancing anaerobic digestion and making improvements to the Brooklyn Park Transfer Station.
- Close the loop by increasing the use of compost in county projects.
- Expand organics collection and improve recycling at county facilities.



Strategy: Reuse and recycle construction and demolition waste

- Require the salvage and recycling of construction and demolition waste at all county funded building projects.
- Educate county contractors on building material reuse and recycling.
- Increase implementation of in-place pavement rehabilitation in road projects.
- Sustainably manage waste after disasters.

 “We need to ask more of people. The assumption that we can all continue to live as we always have, consuming and disposing wantonly, driving everywhere, is a fallacy, and we need initiatives that make it easy for people to change their habits. Or expectations that require change. And the county must lead the way. Every county building should have organics recycling, 100% green energy, and other easy changes. If the county isn’t showing up and making changes, no one else will.”

– Resident comment

Goal: Reduce emissions in ways that align with core county functions and priorities

Strategy: Understand the climate impacts of our purchases and mitigate the largest impacts

- Conduct a consumption-based emissions inventory and use the results to create a more comprehensive approach to climate change mitigation.
- Educate residents on the climate impacts of consumer choices and expand efforts that educate residents and businesses on the importance of waste prevention, recycling, and composting.
- Develop and implement a county sustainable purchasing policy on par with other leading public entities and provide sustainable purchasing best practices.
- Encourage purchases that prioritize reuse, durable goods, and avoiding disposables.

Target metrics

- Implement a consumer food waste prevention campaign by 2022.
- Recycle 75% of waste and send zero waste to landfills by 2030.
- Divert at least 75% of construction and demolition waste for reuse or recycling.



Buying sports equipment second-hand.



Goal: Reduce emissions in ways that align with core county functions and priorities



Carbon sequestration on county-owned property

Net zero or carbon neutral refers to achieving net zero carbon emissions by “balancing” a certain measured amount of carbon released with an amount of carbon offsets that remove carbon from the atmosphere through carbon sequestration.

Planting and protecting trees, forests, and other natural ecosystems is the most effective way to remove carbon dioxide from the atmosphere. Trees and plants remove carbon dioxide from the atmosphere through photosynthesis and store it in soils or biomass until they die or are cut down. Other examples include using soil additives, such as compost and biochar, and growing cover crops on fallow agricultural lands. Biochar is wood that is heated to create a specialized charcoal that acts like a sponge to hold nutrients in the soil for a long time and help plants grow better.

 **Objective:** The county sequesters carbon on county-owned property, including along county road rights-of-way and tax-forfeit properties.

Strategy: Reassess policies and practices to increase carbon sequestration on county-owned properties

- Develop goals, accounting strategies, and guidelines to help staff advance carbon sequestration on county projects.
- Prioritize trees and native plants over turfgrass in landscape designs on new projects.
- Convert from turfgrass to other landscape types where appropriate to improve carbon sequestration.
- Use compost and biochar as a soil amendment on county projects.



Biochar being used on Hiawatha Avenue in Minneapolis.

Target metrics

- Develop and track a parcel-specific carbon sequestration metric for county properties by mid-2021.



Goal: Partner in ways that can be most impactful

Climate change is one of the most pressing challenges the county faces because of its significant environmental, societal, and economic impacts on both a global and local level. We know that no one entity can achieve the complex and evolving goal of climate adaptation on its own.

Developing the Climate Action Plan is foundational to the county's response to climate change. However, a plan is only as good as the execution of the strategy. The county has clear authority in some areas of this plan, for example operating the county's roadway network or managing waste responsibly. Other strategies in this plan will require influencing and supporting other organizations that have responsibilities in those areas, like land use and energy.

The plan's success relies on engaging a broad range of stakeholders, including public partners, businesses, community organizations, employees, and residents. The county's Racial Equity Impact Tool guides how we engage with community, particularly those most impacted by a policy, program, or budget decision, and ensures that we consider how the community may benefit or be burdened by those decisions. This process is key to understanding impacts and developing solutions.

Building a more equitable and resilient community will be most effective if the county can align priorities, leverage resources, and foster partnerships.





Goal: Partner in ways that can be most impactful

Public entity partners

Staff conducted several meetings and surveys with managers, administrators and senior leaders at Hennepin County's cities, watershed organizations, park districts, and other regional and state units of government to learn about their priorities for climate work and opportunities for collaboration, and later to gather feedback on proposed strategies that will require external partnership and greater coordination to achieve. More than 80 public entity partners shared feedback through these efforts.

 **Objective: Partnership models driven by mutual climate goals are explored and pursued**

Strategy: Pursue strategies with the widest agreement and clearest direction forward

- Foster long-term, integrated planning that includes jointly collecting and analyzing data and modeling with a lens on health and racial equity.
- Reduce localized flooding and coordinate regional stormwater resiliency efforts.
- Decarbonize transportation and buildings.
- Educate and engage the public in taking collective action.
- Raise a collective voice for climate policy at the local and state level.



Hennepin County's climate action team meets in January 2020



Goal: Partner in ways that can be most impactful

Community organizations

Staff conducted feedback sessions with representatives from nonprofit, community-based organizations as well as high-school-aged youth involved in environmental and climate change groups. The community organizations and youth represented a diverse set of audiences throughout Hennepin County. Staff also presented to the county's Race Equity Advisory Council, a group of appointed members that advise county leadership on reducing racial disparities and advancing racial equity throughout Hennepin County.

Partners provided feedback on the county's priorities, foundational strategies and approach to the climate action plan, shared the impacts their organizations and community have experienced from climate change, and described how the county's priorities align with what they think we need to do to create a climate-friendly future. The participants expressed strong interest in collaboration and commitment to working with us to ensure our plan is effective and impactful.



Objective: Communities are engaged and empowered through partnership and shared leadership

Strategy: Establish long-term partnerships to increase engagement and support community-driven solutions

- Foster long-term community engagement that takes a social and environmental justice lens and gives community partners and youth a voice in plan development and implementation.
- Support community initiatives and empower local leadership to ensure solutions are relevant and effective.
- Improve climate education throughout the county by partnering with community groups and schools to ensure messages and messengers are relevant.
- Take a strong leadership position and collaborate broadly with diverse partners to encourage bold climate action at the local and state level.
- Implement solutions and support community-driven initiatives that provide financing options, offer job training and workforce development, and increase investment in vulnerable communities.
- Facilitate community involvement in measuring progress toward meeting the established goals.



Community members add design ideas for a sustainable landscaping project at the building complex where they live.

Foundational strategies

Staff recommend this set of foundational strategies as the best place to start to serve as a strong foundation for the county's long-term response to climate change.



Strengthen individual and community resilience

- Communicate climate risks, develop education efforts, and support collective action.
- Foster relationships with communities to engage, listen, and respond with people-centered solutions.
- Strengthen sustainable access to affordable housing, healthcare, food, and transportation for residents, particularly in areas that have the greatest vulnerabilities.
- Improve preparation for and response to extreme weather.



Cut greenhouse gases from transportation

- Reduce vehicle miles traveled in Hennepin County and throughout the region.
 - Advocate for the buildout of the planned transit routes.
 - Expand transit-oriented development and bicycle and pedestrian facilities.
 - Reassess flexible work schedules and facilitate remote work for employees.
 - Manage the road system to minimize pollution by leveraging additional technologies.
- Promote electric vehicle infrastructure regionally by working with electrical utilities to install charging stations.



Transition to renewable energy sources and reduce energy use overall

- Invest in renewable energy through utility sources, community solar gardens, and onsite solar.
- Prioritize conservation, efficiency, and renewable energy in policies and programs.
- Support affordable adoption of renewable energy and conservation for energy consumers, including small businesses and low-income households.

Foundational strategies



Prevent food waste and divert organic material from the trash

- Support food rescue efforts to divert more food to people in need.
- Help businesses and organizations that produce a lot of food waste implement best practices for preventing food waste.
- Develop organics recycling infrastructure by advancing anaerobic digestion and making improvements to the Brooklyn Park Transfer Station.
- Increase the use of compost in county projects.



Design infrastructure, buildings, and property to future climate conditions

- Work with local and regional partners to reassess stormwater design standards.
- Build and renovate county buildings following state's sustainable building guidelines (B3) as possible with a goal of net-zero emissions.
- Implement construction and demolition waste procedures.
- Use life cycle analysis for selecting climate-friendly building materials and furnishings.
- Develop and implement a sustainable purchasing policy.



Build and maintain green infrastructure and sequester carbon on all county-owned property

- Install green infrastructure to manage stormwater on county-owned property, including on tax-forfeited properties in flood prone areas to protect surrounding properties and create green spaces.
- Explore a green jobs/pathways program concept for installation, establishment, and maintenance of green infrastructure.
- Convert turfgrass to plants that sequester carbon, where appropriate.



Decrease the heat island effect, especially in areas with highest vulnerability

- Coordinate operations of readily accessible and culturally appropriate cooling centers.
- Preserve mature trees, plant more trees and plants, and address maintenance issues.
- Convert hardscape where possible into pervious pavement or green infrastructure.
- Pursue site development performance standards that include green infrastructure.
- Gather better, real-time data to allow for targeted notification of weather-related warnings.



Engaging residents to act on climate change

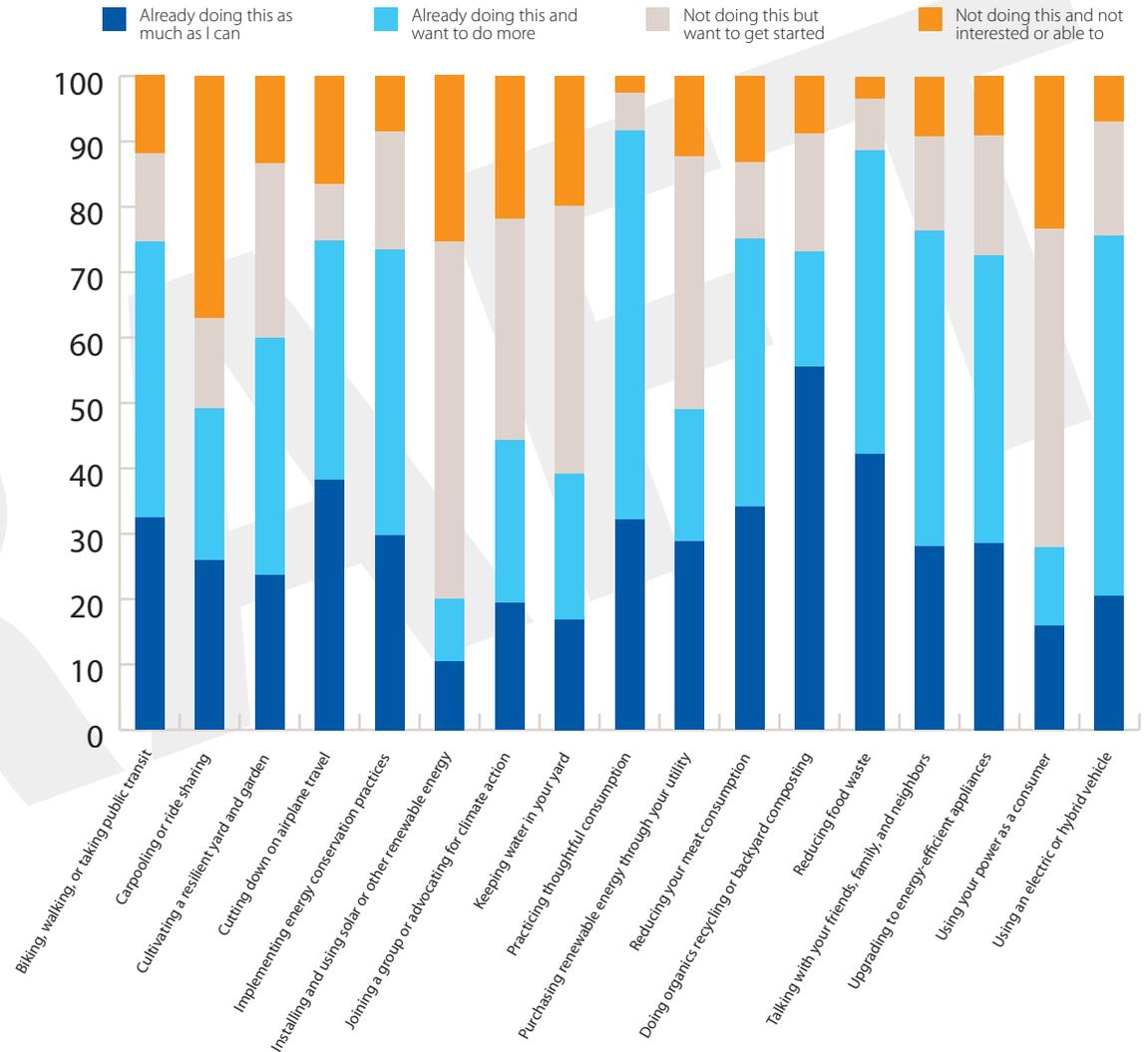
In responding to climate change, the county's top priority should be focusing on solutions that change the systems that the county controls and using our influence as a bold leader to collaborate with local and state partners to achieve broader systemic change. The foundational strategies identify the best place for the county to start on those systemic changes.

Engaging our residents to take action on climate change is also important. Individual action on climate change matters because it helps get people more engaged in the issue, reduces individual contributions to the problem, quickly scales to more impactful collective action, and puts pressure on government agencies, businesses, and institutions to make greater, systemic changes.

When being engaged in climate change, people are often presented with a long list of things that they can do, leaving them overwhelmed and wondering where best to focus their efforts. Additionally, there is often a disconnect among the actions people think are effective at addressing climate change and the actions that are actually effective. This can leave people feeling like their small actions will have little impact on the scale of the global problem, while ignoring some surprising actions that can actually have a huge impact.

Determining the most impactful actions to focus on for outreach and communications involves factoring in an action's potential to reduce greenhouse gas emissions, people's willingness and readiness to take that action, and the ability of the county and partners to support people in taking that action. Responses in the public survey to a question on climate actions provide useful insights (Figure 13). This information can help guide what information to promote, what resources and programs to develop, and what partnerships to establish.

Figure 13: Resident interest and engagement in climate actions



Engaging residents to act on climate change

Actions residents are already taking

Even among the actions that residents are already doing, there is opportunity for more engagement. The most common actions that residents who responded to the survey are already doing include (% already doing and not able to do more):

- Signing up for organics recycling or composting in your backyard (55%)
- Taking steps to reduce food waste (42%)
- Cutting down on airplane travel (38%)

It's important to note that the survey respondents are likely more engaged in environmental issues and taking more environmental actions than the general public. So with just around half of the respondents already engaged in these actions, there is room to encourage more people to take these actions. Additionally, the responses to cutting down on airplane travel could be skewed by travel restrictions caused by the COVID-19 pandemic, so focusing on how to encourage people to continue these actions will be important.



Actions with the best opportunity for increased engagement

Residents identified actions that quickly scale up to having a larger collective impact as actions they want to be doing more – using their power as a consumer, practicing thoughtful consumption, and talking to others about climate change. Residents likely need tools, support, and ideas for getting engaged in these actions. Residents are also interested in renewable energy, energy-efficiency, and electric or hybrid vehicles, as well as lawn care practices that provide habitat and manage water runoff.

The most common actions that survey respondents either said they are already doing and want to do more or are not doing but want to start include (% already doing this and want to do it more plus not doing this but want to start):

- Using your power as a consumer to support businesses that are taking steps to reduce their climate impact (72%)
- Practicing thoughtful consumption by only buying what you need, investing in high-quality, long-lasting items, shopping used, and borrowing items when possible (65%)
- Installing and using solar energy or other renewable energy at your home (64%)
- Cultivating a resilient yard and garden by planting native species that provide habitat for pollinators, considering turf alternatives that require less watering and mowing, or planting a tree. (63%)
- Keeping water in your yard by installing rain barrels, designing a rain garden, or redirecting downspouts (63%)
- Talking with your friends, family, and neighbors about why you are concerned about climate change and what you are doing (63%)
- Upgrading to energy-efficient appliances (62%)
- Using an electric or hybrid vehicle (61%)

Engaging residents to act on climate change

Actions with the highest barriers to adoption

The actions that residents said would be the hardest to adopt include carpooling or ride sharing, installing renewable energy at their home, or using an electric or hybrid vehicle. Several of these actions are also on the list of actions to focus on for increased engagement, showing that some residents think the barriers to taking these actions are more insurmountable than others. Although more needs to be learned about the barriers to taking action, some barriers that respondents mentioned include renting versus owning their home and the cost to implement some of these options. Focusing on understanding and reducing barriers and changing systems to make it easier, more convenient, and more accessible for residents will make it more likely that residents will take action.

Actions that survey respondents said they were least interested in or able to do (% not doing this and not interested or able to):

- Carpooling or ride sharing. (37%)
- Installing and using solar energy or other renewable energy at your home. (25%)
- Using an electric or hybrid vehicle. (23%)



Residential solar panels, photo by Jeff Stuhr, courtesy MPCA

Appendix A: Acknowledgements

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Appendix B: Public engagement findings



The first phase of public engagement on the climate action plan

A series of feedback sessions were held in November 2020 with community groups, youth, and the county's Race Equity Advisory Council. A total of 84 people shared feedback on the climate action plan's foundational strategies, impacts the community has experienced from climate change, and their priorities for a climate-friendly future.

An online survey for residents was also conducted to learn about impacts the community has experienced from climate change and understand residents' priorities to inform the plan. The survey received 2,300 responses.

Key findings from the first phase of external engagement efforts

Many insights from the feedback have been incorporated throughout the plan, including the impacts the community has experienced from climate change, the most important values they hold in responding to climate change, and their desire for green jobs. The following key findings reflect commonly expressed ideas that garnered strong support.

Set ambitious goals and provide bold leadership

Most open-ended comments from the online survey stressed the urgency of the issue of climate change and encouraged the county to respond by being ambitious and providing bold leadership. This sentiment was echoed in the listening sessions, with participants noting how Hennepin County's response will be a catalyst for both local and state efforts. Participants wanted to see a more aggressive timeline and stressed that meaningful metrics need to be established so the county and community could measure progress toward meeting our goals.

What else would you like to tell the county about climate change?

Visual of topics identified from open-ended comments



Appendix B

Climate change is intersectional with racial disparities

Although everyone will be impacted by the climate crisis, it will not be experienced equally. Community partners and survey respondents see the connection of systemic racism and environmental injustices. Many community organizations see the county's development of a climate action plan as an opportunity to advocate for changes in the county's transportation network and waste management system, specifically operations of the Hennepin Energy Recovery Center (HERC), as well as better health outcome for people of color.

The plan provides a new opportunity to develop and implement a collective vision for:

- Health and wellbeing outcomes
- Equitable transportation system
- Zero waste future
- Green economic recovery, workforce development, and job creation

Focus on systems change, not individual choice

A significant number of survey comments focused on the desire for transformational systems change through leadership and the use of policies, procedures, and incentives rather than focusing on educating residents on the actions they can take individually. At the same time, community partners explained that educating the public and empowering their involvement in change would help expand the county's reach and the impact of greenhouse gas emission reduction strategies. Community partners expressed the need for the county to

authentically partner with communities to empower local leadership and community-driven initiatives to make solutions relevant and effective.

Implications and next steps

The first phase of public engagement with community groups, youth, and the general public provided insights on how the community is experiencing the effects of climate change and helped us understand how our values and priorities align with those of the community.

In many instances, we heard that we are generally on the right track, and the community supports us in taking bold and urgent action. We heard the importance of taking an intersectional approach to ensure our climate action plan responds to issues of racial and environmental justice, health, workforce development and other topics. We also heard many good ideas in the meetings for how the plan can better reflect the values and priorities of the community.

The following implications from the first phase of engagement will guide the next steps in the development of the climate action plan:

- The county should revisit its greenhouse gas emission reduction goals and use information and guidance available from international, national, state, and local sources to consider more ambitious goals. The county also needs to further analyze the impacts of the climate action plan strategies to refine the metrics that the county, community, and public can use to measure progress.

Appendix B

- Like other environmental justice issues, those who least contribute to the problem of climate change will be most impacted. In this climate action plan, the county has an opportunity to recognize our obligation to work toward eliminating disparities in our response to climate change.
- The pathway to transformative climate policies must be created by the county and other leaders, and then supported and moved forward by the public. To advance an impactful climate change response, the county needs to engage residents, listen to how climate change is impacting them, and collectively build support for solutions. Defining and articulating our collective vision for a climate-friendly future is critical to motivating collective action.
- Education on individual choice and climate literacy is supported by community members, and community members expressed the need for more education on the impacts and increased awareness about the urgency of the issues. These efforts need to be paired with support of community-led initiatives and empowerment of local leadership.
- Awareness about the impacts of climate change, especially the connections to racial equity, health, and unequal impacts to vulnerable communities, needs to be heightened. Presenting findings from the vulnerability assessment helped groups who were struggling to see the connections more clearly understand the full implications of climate change.
- The county needs to pay attention to how perspectives on issues, who is making decisions, and who delivers the message all matter.

There are existing community-driven programs and initiatives that are having big impacts, and it's important that these groups are represented in the solutions. The county also needs to look at how equitable hiring, contracting, and small business development can be expanded with new investments.

- Community engagement efforts during the formal plan adoption process and during plan implementation need to be multi-faceted, robust, and consistent. Participants in the feedback sessions represented a broad diversity of communities in Hennepin County. The participants expressed strong interest in collaboration and commitment to working with the county to ensure the plan is effective and impactful. They were interested in regular updates and ongoing engagement opportunities during the plan development and implementation. Survey respondents tended to be more white and female, which is consistent with the typical demographics for the county's environmental communication channels. Deeper engagement with more diverse audiences and vulnerable communities will require partnerships with community organizations who can help lead outreach efforts that resonate with their communities.

The full results from the public survey and a summary of the feedback from the public engagement sessions are available at hennepin.us/climateaction. The website also has a link to sign up for Climate Action Updates where information about future engagement efforts during the board adoption process will be shared.