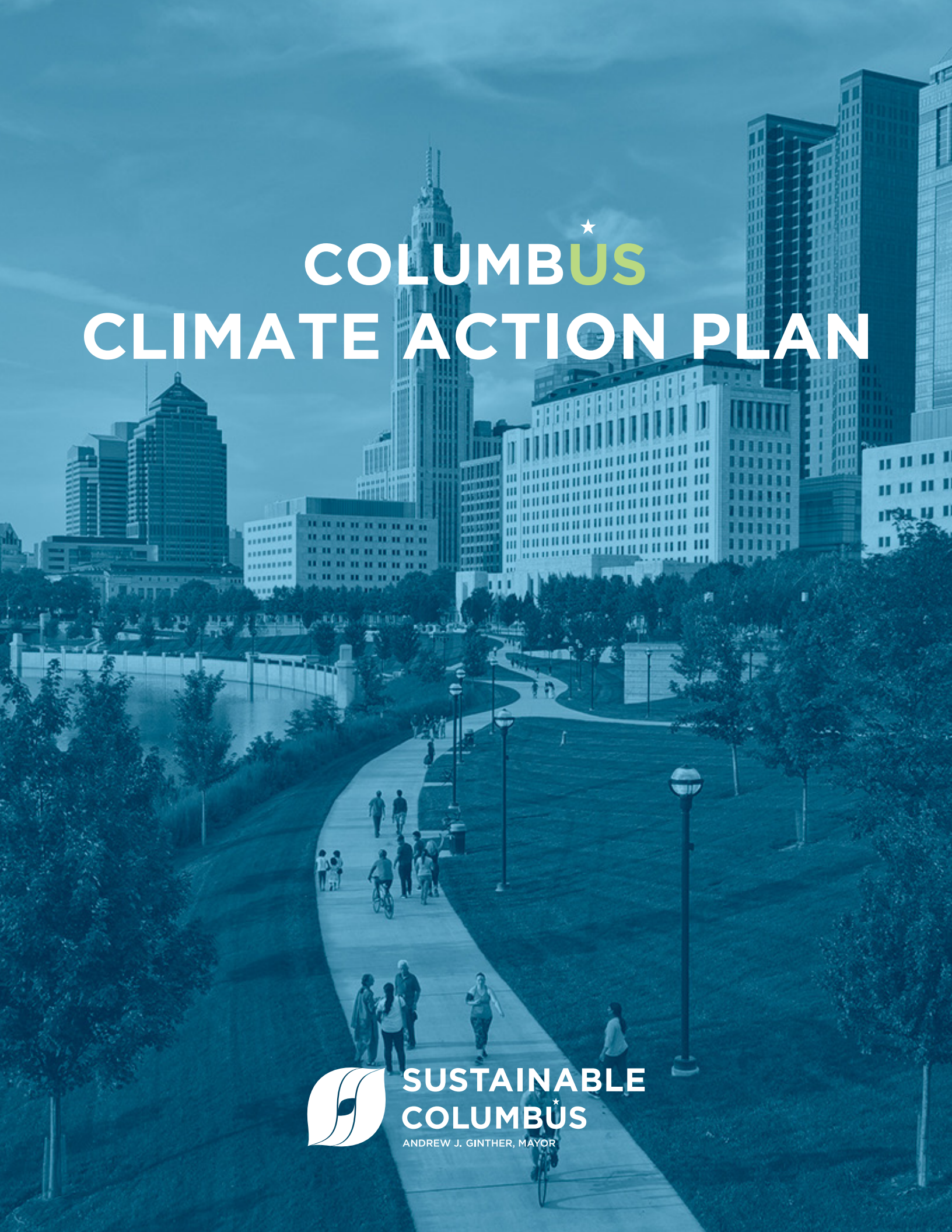


COLUMBUS CLIMATE ACTION PLAN

SUSTAINABLE COLUMBUS

ANDREW J. GINTHER, MAYOR

ACKNOWLEDGMENTS

This plan would not be possible without the many people and organizations whom contributed to make this a community-wide plan for a better future in Columbus.

CITY OF COLUMBUS LEADERSHIP

Mayor Andrew J. Ginther / Tracie Davies, Director, Public Utilities / Bryan Clark, Deputy Director, Sustainable Columbus / Alana Shockey, Assistant Director, Sustainability / Erin Beck, Assistant Director, Sustainable Columbus / Councilmember Emmanuel Remy

COLUMBUS CLIMATE COMMITMENTS WORKING GROUP

Mandy Bishop / Anthony Celebrezze III / Thomas Diamond / Troy Euton / Robert Ferrin / Michael Fielding / Christopher Lohr / Rory McGuiness / Jeffrey Ortega / Kathy Owens / Samantha Schneider / Robert Stewart / Jenna Tipaldi

COMMUNITY STAKEHOLDERS

All residents, business and organization representatives, regional partners, workshop participants and survey respondents.

IMAGE CREDITS

All photographs that do not list source information are the property of the City of Columbus.

CONSULTANTS

ARUP MKSK

Completed and published December 2021.

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1 INTRODUCTION

A MESSAGE FROM THE MAYOR



Dear Neighbors:

In 2020, I put forth the vital goal of becoming a carbon neutral Columbus by 2050, ensuring that we do our part to combat global climate change. Shortly after announcing this commitment, our community, along with the rest of the world, was dramatically impacted by the devastating effects of a historic pandemic.

COVID-19 made hardships and inequities in our systems and institutions more severe and apparent, clearly demonstrating that access to opportunity and resources is not evenly distributed. It underscored the pressing need to take thoughtful, deliberate action on climate change and to promote environmental justice across all our neighborhoods.

Our most vulnerable residents are already being affected by a changing climate. Extreme temperatures lead to higher energy bills and frequent home repairs. Heavy rains cause worse flooding, inside and out. And more 90-plus degree days create air quality concerns for children fighting asthma and increase the potential for heat stroke and other health concerns among those who lack access to cooling.

I am proud that our city has continued to pursue meaningful reforms despite the unprecedented challenges stemming from the pandemic.

We implemented Clean Energy Columbus, our city's 100% clean energy aggregation initiative, ahead of schedule. Residents are already receiving energy from Ohio-based wind and solar sources – a tremendous leap toward achieving our 2050 carbon neutrality goal.

Now, it is my pleasure to introduce the Columbus Climate Action Plan, the roadmap by which we will realize our goal of becoming fully carbon neutral. This plan would not have been possible without the input and dedication of city staff and partners, environmental specialists and advocates, business and industry leaders, and, mostly importantly, our residents.

The Columbus Climate Action Plan outlines how to reduce harmful greenhouse gas emissions and pollutants, and ensures that we eliminate the environmental racism that has plagued our most vulnerable communities for far too long. It also emphasizes the need to build a Columbus that is resilient to global climate change while mitigating future risks. The threat is clear. The stakes are high. And our obligation to our children, and their future, compels us to act now. We owe it to our city, our region, our country and, indeed, our world.

I invite you to read this plan and join our movement to build a stronger, more equitable and more sustainable Columbus.

Sincerely,



The Honorable Andrew J. Ginther
Mayor, City of Columbus

COMMUNITY PARTNER'S MESSAGE

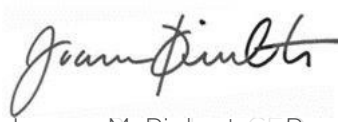
To our Columbus Community:

It's clear that fighting climate change is among the defining issues of our time. Our Columbus community is experiencing its effects and increased heat and rain is putting our health and economic prosperity at risk. In particular, it is our communities of color, low-income populations, and residents in our Opportunity neighborhoods who are being impacted by climate change and are most at risk of future impacts.
All of us will need to do our part to ensure environmental and racial justice, so we can protect the long-term vitality of our planet, and most importantly our Columbus community.

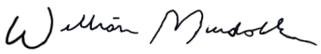
That's why we support Mayor Andrew J. Ginther's goal for our community to be carbon neutral by 2050, while making significant emissions reductions by 2030 all while imparting equity and environmental justice along the way.

As organizations that have worked with the City of Columbus on this landmark Climate Action Plan, we intend to continue our leadership on these important issues. We are committed to working in partnership with the City, along with other organizations, stakeholders, and residents to achieve the ambitious equity and climate goals.

We all need to do our part. Let's get to work.



Joanna M. Pinkerton, President/CEO
Central Ohio Transit Authority



William Murdock, Executive Director
Mid-Ohio Regional Planning Commission



Jordan Davis, Director
Smart Columbus



Ty Marsh, Executive Director
SWACO, From Waste to Resources

45%

GREENHOUSE GAS EMISSIONS REDUCTION BY 2030

100%

GREENHOUSE GAS EMISSIONS REDUCTION BY 2050

EXECUTIVE SUMMARY

Columbus' Climate Action Plan (CAP) is a coordinated, living document to ensure the City is doing its part to combat the effects of climate change while imparting equity and environmental justice to disproportionately affected community members. Summer heat emergencies, more frequent flooding, and increasingly stronger storms are stressing infrastructure, endangering human life and increasing the cost of living in Columbus.

The global climate crisis requires structural and individual changes that our future generations deserve - shifting how we produce energy, gather food, move ourselves around and construct buildings. Through cooperation, moving beyond competition and control, we must build a large, powerful team working to achieve positive outcomes for all.

Following the federal announcement that the United States was withdrawing from the Paris Climate Agreement in 2017, Mayor Ginther committed Columbus to the Global Covenant of Mayors for Climate & Energy and announced our community's **2050 carbon neutrality goal** at the February 2020 State of the City. The timeline and commitments of this Plan align Columbus to be on track with the Paris Climate Agreement. The scientific findings from the latest Intergovernmental Panel on Climate Change (IPCC) demonstrate how crucial it has become to implement climate action that will limit global temperature rise to 1.5° Celsius by 2050 from pre-industrial levels. The CAP will encompass near-term actions and more broadly defined long-term strategies to achieve carbon neutrality from municipal and community sources.

Columbus has been able to leverage progress from the Bloomberg Philanthropies American Cities Climate Challenge and U.S. Department of Transportation's first Smart City Challenge grants laying the groundwork for further engagement and successful partnerships. As a rapidly growing Midwest city and the 14th largest city in the United States, the commitment to carbon neutrality is an ambitious undertaking that must be implemented through focused acceleration.

The CAP lays out a thoughtful set of actions that the City government, private businesses, organizations and residents can implement to significantly reduce the community's greenhouse gas (GHG) footprint, while also creating a more equitable and resilient community. The five sections of the CAP outline **13 strategies** that have **32 quantifiable actions**. The leadership from Sustainable Columbus and the City's Columbus Climate Commitments Working Group appointed by the Mayor have been integral in the plan development, and continued engagement will be needed to adjust targets for technology advances, public receptivity and market conditions.

Movements are often focused on what we are against, this is Columbus' opportunity to embrace a climate change agenda centered on the *yes*. Yes to creative ideas, yes to including more diverse voices than just our own, yes to sharing all our success stories, yes to implementing equitable solutions, and yes to building local resilience. The CAP development is carefully balanced between the actions necessary to reduce GHG emissions while implementing preventative measures for vitality, livability and prosperity of the Columbus community.

LEADING WITH EQUITY

"Most people don't feel safe. It's hard to simply exist outside in our natural environment."

"All I remember is going outside every morning and smelling burnt plastic. I don't know what it was but it was terrible to breathe in day after day."

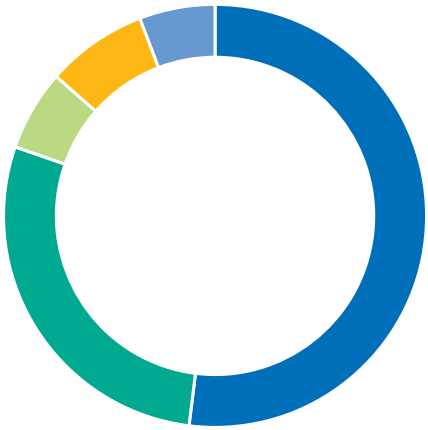
Focus Group Participants & Columbus Residents, Equity Capacity Building with CommEN Strategies

Impacts of climate change are being felt daily by residents throughout Columbus. As our community faces increasingly hotter days and stronger, more frequent rainstorms, our communities of color and marginalized communities are most at risk. A variety of terms are frequently used in reference to racially, ethnically and income diverse communities, such as communities of color, Black and Brown communities, and Black Indigenous People of Color (BIPOC). We have chosen to use the term communities of color, but recognize the importance of other inclusive terms.

A recent U.S. EPA report quantified climate change impacts, at a national level, on these marginalized communities should global temperatures continue to rise. The report showed that people of color are most likely to live in areas that will be impacted most by climate change. Black and African American individuals are 40% more likely to live in areas with the highest projected increase in mortality rates due to climate-driven extreme temperatures, and 34% more likely to live in areas with the highest projected increase in childhood asthma due to climate-driven air pollution. Hispanic and Latino individuals live in areas with the highest projected labor hour losses in weather-exposed industries due to more frequent climate-driven hot days with high temperatures.

Columbus' 2020 census population passed 900,000 residents for the first time - an increase of over 15% in the past decade. Within that growth comes significant growth in the Black, Asian, and Latino community, all of which underscores the significant urgency and need to center equity and environmental justice in how our community achieves our climate action goals. We must go beyond GHG emission reductions to ensure our marginalized communities have the resources, programming, and supports in place to improve their quality of life now and into the future.

RACIAL DEMOGRAPHICS OF COLUMBUS, OHIO



Source: U.S. Census 2020

EQUITABLE ENGAGEMENT AND TRANSPARENCY

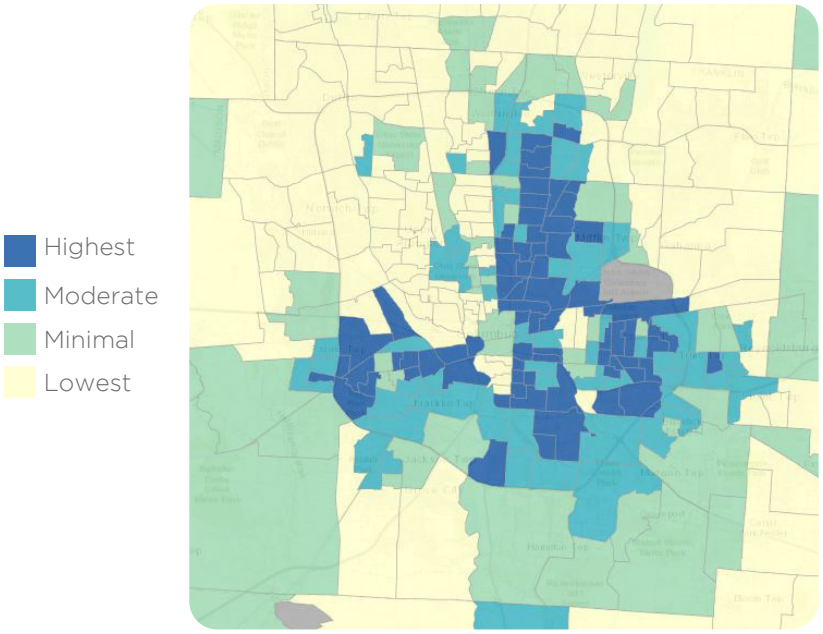
Conducting equitable engagement with diverse voices and clearly outlined procedures for input and influence is necessary in breaking down systematic inequality that is exacerbated by the impacts of climate change. Adapted from the C40 Inclusive Community Engagement global strategy, the CAP intends to strive to meet the following practices:

- Center on equity, diversity, and inclusion
- Build community capacity through engagement
- Partner with residents and community groups to deliver meaningful change

Identifying marginalized groups, and the issues most important to them is imperative to understanding the value of implementation. Assessing these sectors of the population that are at risk and working to reduce any unforeseen negative impacts from proposed actions is a direct outcome from intentional planning and proper implementation.

Teams working to implement strategies and actions from the CAP can utilize tools that may help to provide an evaluation within a local context, such as the Center for Disease Control (CDC) Social Vulnerability Index which evaluates populations that have special needs or disabilities, lack access to vehicles, have limited English proficiency and/or live in crowded housing down to census tracts.

COLUMBUS REGION SOCIAL VULNERABILITY INDEX



Source: 2018 Social Vulnerability Index Map, CDC.gov

COMMUNITY ENGAGEMENT

Due to centering equity and environmental justice, community engagement is and will be critical to the ongoing success of the CAP. Stakeholder engagement groups and community input have been coordinated throughout the CAP process. While the Covid-19 pandemic did cause a shift from in-person to virtual sessions during the first phase, additional efforts were added to increase feedback from the community.

Several methods of input were used to engage with the community. Virtual meetings, downloadable Meeting Toolkits, and a Consider.it website were avenues for residents to voice feedback and the City received nearly 850 comments. A virtual Public Hearing held with Councilmember Emmanuel Remy, Chair of the Environment Committee, also drew large engagement, with 18 public speakers.

Overwhelmingly, community feedback demonstrated care and urgency around climate action, asking for the plan to do more, and do it faster. The second phase of the project took that to heart and pushed significantly harder on the ambition and timelines of the short-term strategies and 2030 target.

Some community feedback highlights from the CAP Consider.it website-based feedback are shared here. Further details on the engagement process can be found in Appendix B.

"Sustainability can help businesses reduce costs and differentiate themselves in the market - helping them recover faster! But, paying for the technical assistance or infrastructure changes to become more sustainable isn't something many small organization can afford, especially now."

10 VIRTUAL MEETINGS

"To empower means to provide power - including residents in every step of the plan (giving them not just a seat at the table to observe but to actively participate), complete a comprehensive community needs and asset assessment to ensure our plans fit the communities priorities AND the science, and fund/ support resident-led climate initiatives to ensure resident ownership of the CAP."

18 PUBLIC HEARING SPEAKERS

"Building a wide coalition of environmentally-conscious business partners, ranging from blue chip organizations to small business owners to strengthen legitimacy. Take a similar approach with residents, mobilizing inner-city and suburban residents across demographic lines - make it deeply and abundantly visible that climate change is everyone's imperative and not the luxury of an 'elite' group that's 'not like me.' "

850 DRAFT PLAN COMMENTS

BUILDING ON EXISTING FOUNDATIONS

The City of Columbus has been working to reduce its municipal GHG emissions since 2005 with environmental policies that have been memorialized in a series of green memos updated on a five-year schedule to push future goals. The first community-scale GHG inventory tracking began in 2013.

Columbus' city limits have greatly expanded through annexation over the past century, and have created many inter-jurisdictional relationships as people live, work and play across a wider regional context. Columbus has been a signatory of Mid-Ohio Regional Planning Commission's (MORPC) Sustainable 2050 program since 2017, to spur collaboration with neighboring counties, townships and smaller incorporated cities on shared goals.

Existing plans, grant awards, studies and progress reports from City departments and community organizations were reviewed to inform emissions forecasting and climate action target development. Highlights of these findings are outlined in Energy, Transportation, Waste, and Water sections below.

HIGHLIGHTS

- Long-term political commitments to take action and set climate change goals are established.
- Short-term planning for Smart Columbus and American Cities Climate Challenge have accelerated climate action resources, particularly around buildings & transportation.
- Ensuring prioritization of equitable implementation and impact should be first and foremost in all climate policies yet to be developed.
- Current climate, environmental conditions, and socioeconomic status have previously been assessed.
- Strategic partnerships are outlined for energy and transportation.
- General education and robust outreach communication will be needed across all initiatives.

ENERGY

The American Cities Climate Challenge (ACCC) and initial Smart Columbus grant have positioned Columbus to have greater traction on the residential, commercial and industrial energy sectors. Both of these accelerator grant initiatives have provided resources such as premier technical support, funding for project implementation, and support for full-time staff to manage projects. Each has demonstrated success through this structure, expanding the impact and reach in the community.

In spite of the pandemic challenges in 2020, Sustainable Columbus was able to pass the first Energy and Water Transparency Benchmarking Ordinance in Ohio and pass a ballot measure with nearly 80% approval of residents for a 100% Ohio-based clean energy Community Choice Aggregation (CCA). These strong regulatory measures will contribute significantly to GHG reduction in the energy sectors.

Clean Energy Columbus was established in June 2021 with Columbus based AEP Energy as the program's supplier. The program provides 100% Ohio-based wind & solar to power homes and small businesses, competitive rates, and community benefits such as jobs and planned energy efficiency programming for residents impacted most by climate change.

Columbus was also able to reach a third milestone by reaching the target of 30,000 home energy audits over two years. Homes with high energy burden were prioritized to assist residents struggling with high utility costs to find solutions.

In the private sector, the expansion of Smart Columbus to focus on sustainability helped lead to the creation of Clean Energy Partners, who will now provide services to assist private businesses, non-profit organizations and other large energy users (who are not eligible for the City's aggregation program) with 100% renewable-focused custom energy solutions.



Image Source: Smart Columbus

The Smart Columbus Experience Center provided a hands on EV showroom for the Columbus community.

TRANSPORTATION

The original inception of Smart Columbus as a clean transportation initiative provided great momentum for the City to be nationally recognized for new pilots and programs. As a large city without rail or train mass transit options, the difficulty of transitioning transportation emissions is no small challenge. The continuation of Smart Columbus as a non-profit entity focused on the nexus of innovation, digitalization, sustainability, and community good, can build on previous work and will be a key partner for assisting in reaching CAP goals.

Electric vehicle (EV) purchasing has been increasing, car dealerships are engaging in electrified dealer programs and thousands of residents are test driving or riding along in EVs. Many of the pilot outreach programs will not have quantifiable impacts measured in the CAP, but provide valuable groundwork for these major behavioral changes.

Another key effort and opportunity moving forward will be the LinkUS Initiative which seeks to provide a complete mobility system along key regional corridors, including high capacity and advanced rapid transit, technology solutions, bicycle and pedestrian improvements, and land use changes. LinkUs is a collaborative initiative co-sponsored by the City of Columbus, Central Ohio Transit Authority (COTA), MORPC, and the Franklin County Board of Commissioners. Aligning this initiative with the strategies and goals of the CAP will provide a path to success in reducing transportation related emissions.

WASTE

The regional SWACO Solid Waste Management Plan (SWMP) was written before Chinese tariffs upended global recycling practices, which had an impact on plastic and glass diversion rates. Approximately 70% of all plastic recycling from the US was being sent to China prior to the ban, and the global flow of scrap commodities have disrupted prices. The SWMP had already been outlining the need for new policies to ensure waste management practices are able to keep pace with expected population growth in Columbus, and now there may be higher costs to manage the waste stream as well.

Organic waste that decomposes in a landfill emits large quantities of methane, a more intense GHG than carbon dioxide. There are locations now looking closer at energy production from waste to energy, but burning plastics can have harmful air-borne chemical releases from mercury and lead that impact surrounding communities. Prioritizing education and outreach plans collaboratively with SWACO will be mutually beneficial to the CAP and overall region.

WATER

Community feedback, specifically including engagement with our marginalized community members, has demonstrated the importance of access to safe, clean drinking water. For those reasons, protecting our watersheds and maintaining and improving water infrastructure has been a priority for the City of Columbus for many years.



Image Source: SWACO

The Sustaining Scioto regional plan outlines a strategy to mitigate threats and vulnerabilities to the watershed water quality. The plan outlines short-term (2015-2025) and mid-term (2026-2045) strategies that the CAP aligns with for implementation within the City limits.

Through the Public Utilities department, Columbus has implemented a first-of-its-kind green sanitary sewer mitigation program called Blueprint Columbus. Infrastructure for sanitary sewers are chronically stressed in cities throughout the United States, and Columbus is poised to see stronger, more frequent rain events due to climate change. Rather than continually building larger pipes, Columbus is undertaking a proactive approach to install rain gardens that naturally manage weather events, rehabilitate aging pipes for longevity, and utilize residential sump pumps to prevent unnecessary demands on the sewer system.

II

DEVELOPING THE PLAN

PROCESS

Columbus joins over 10,000 cities across the globe, representing over 900 million people, committed to the trajectory of the Global Covenant of Mayors for Climate & Energy to undertake measures which:

- Reduce GHG emissions
- Prepare for the impacts of climate change
- Increase access to sustainable energy
- Track progress toward these objectives.

The development of the Columbus CAP follows the steps aligned with the ICLEI Clearpath platform for GHG inventories, scenario modeling and monitoring.

1. Establish a Baseline GHG Inventory:
Columbus has been reporting community GHG inventories since 2013. The Baseline inventory utilized is the scaled 2013 GHG Inventory.

2. Adopt a Target:
The timeline of this CAP is able to capture the latest science from IPCC which reflects the urgency of meeting the 1.5° C limit, equivalent with a 2050 carbon neutrality goal.

3. Forecast Emissions:
Utilizing regional population and economic growth factors, different scenarios are outlined for 'No Further Climate Action' as compared to the 'Adopted Climate Actions' through the year 2050.

4. Strategy Selection:
Iterations of each strategy option are tested and optimized to maximize GHG reduction impact, reduce future adaptation needs and align with expected benefit priorities.

5. Funding & Implementation:
Upon adoption of the plan, strategies and actions will require differing amounts of funding and personnel support to be implemented. The Lead Agency role is responsible for managing progress and coordinating where gaps exist.

6. Monitor & Track Progress:
Ongoing monitoring at a minimum annual schedule will be necessary to proactively respond to unforeseen future scenarios or advanced progress and adjust actions as needed.

Baseline Inventory



Columbus' 2013 community GHG inventory

Adopt Target



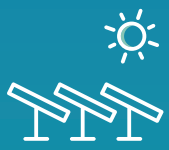
February 2020: Mayor Ginther announced a Carbon Neutral by 2050 Target

Forecast Emissions



Future emissions models based on regional population and economic growth factors

Strategy Selection



Specific actions to reduce the GHG emissions and prepare for the future climate

Funding & Implementation



Upon adoption of the plan, strategies and actions will have assigned responsibilities and priority to begin implementation and funding plans

Monitor & Track Progress



After the plan is written, ongoing monitoring will occur to track progress, respond to unforeseen future scenarios and adjust strategies as needed

GREENHOUSE GAS INVENTORIES

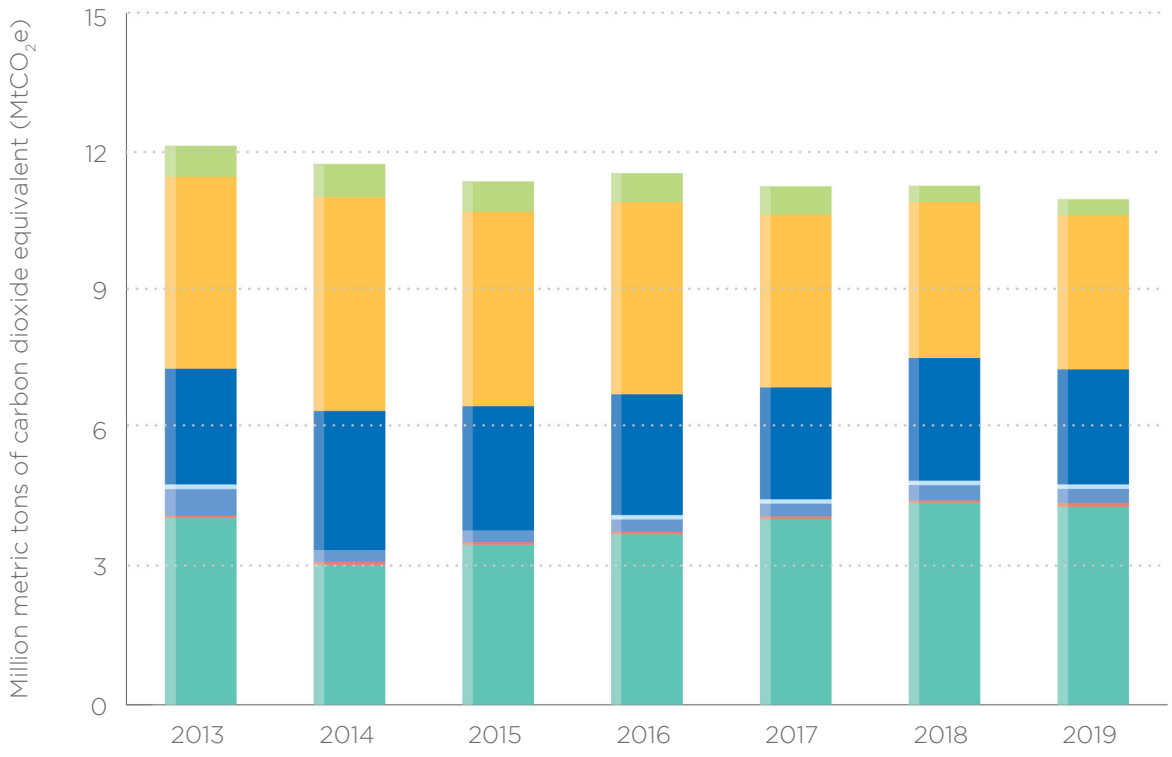
Columbus has been reporting Community-scale GHG inventories annually since 2013 using the ICLEI Clearpath tool. These metrics capture a snapshot of the impacts contributing to climate change and are essential to manage future emissions. The GHG inventory quantifies the amount of heat trapping gases released from human activity within the City of Columbus municipal limits.

The CAP utilizes the community-scale inventory, which follows the global standard reporting method – Global Protocol for Community-scale Greenhouse Gas Emissions (GPC) for a Basic reporting level.

The following emission scopes are included in Columbus' GHG Inventories:

- Scope 1: Emissions from sources within City boundary - including building on-site fuel combustion, waste disposal services, water/wastewater treatment facilities and distribution, and in-boundary transportation.
- Scope 2: Emissions from grid supplied electricity, transmission and distribution losses and steam.
- Scope 3: Emissions that occur outside the City as a result of activities within - including waste disposal and water/wastewater treatment.

COMMUNITY-SCALE INVENTORIES



BASELINE INVENTORY

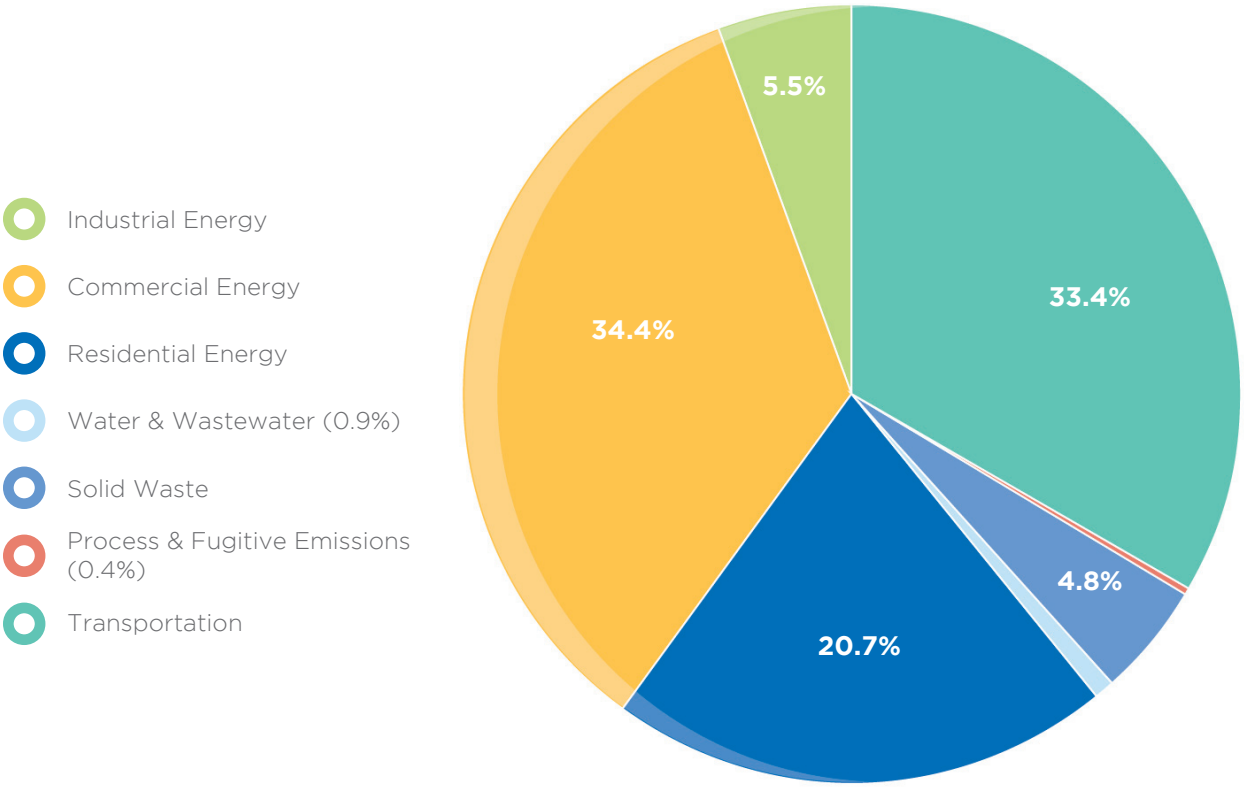
The baseline inventory is used to calculate expected emissions reductions from the proposed climate actions in this plan. The 2013 GHG inventory used for the CAP Baseline is a scaled version of the 2018 Community-scale inventory.

Since 2013, transportation emissions have been steadily increasing aligned with population growth, while residential and commercial energy have been decreasing from efficiency efforts and a cleaner electric grid. As shown in the 2013 Baseline Inventory by Sector graph, transportation makes up the largest proportion of emissions at 33%. However, it is important to note that the industrial, commercial and residential energy sectors together represent the impact from the building stock of the City for a combined 60% of emissions.

Despite Columbus being a rapidly growing city, its GHG emissions have remained relatively steady over the past eight years. Comparing the emissions to population data results in a per capita GHG metric. The latest 2019 GHG Inventory shows the lowest level thus far at 12.23 metric tons of carbon dioxide equivalent ($MTCO_2e$) per capita for the year.

Further information on the GHG modeling methodology and baseline inventory are included in Appendix C.

2013 COMMUNITY-SCALE BASELINE INVENTORY BY SECTOR



ENERGY

Energy use contributes to the largest proportion of GHG emissions in Columbus, most of which comes from consumption in buildings. The sources of energy are grid supplied electricity and natural gas. The majority of Columbus electricity customers are serviced by AEP Ohio, but there is also a portion of the community that has municipal electric service from the Columbus Division of Power. While energy sectors have reduced emissions by 18% between the 2013 and 2019 GHG Inventories, further focus on clean power generation is required to meet the goals of the CAP.

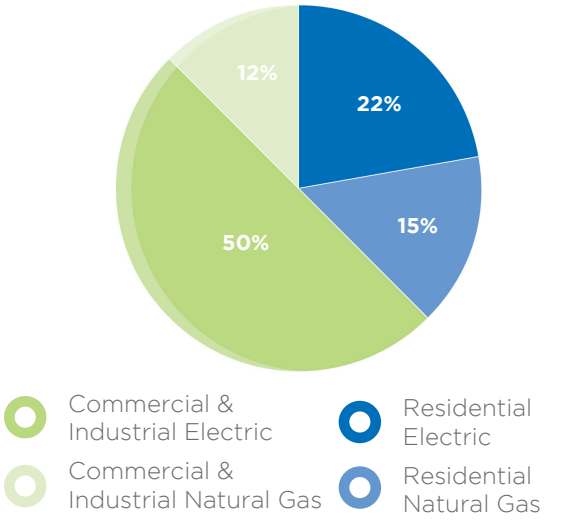
TRANSPORTATION

Columbus is currently a car dependent city, with the average household having two cars and a majority of commuters traveling alone to work. As a result, the largest proportion of transportation emissions are from these single-occupant vehicle miles. Aviation emissions are also a significant portion of the transportation sector and represents an area that will require longer-term planning, implementation and technology advances.

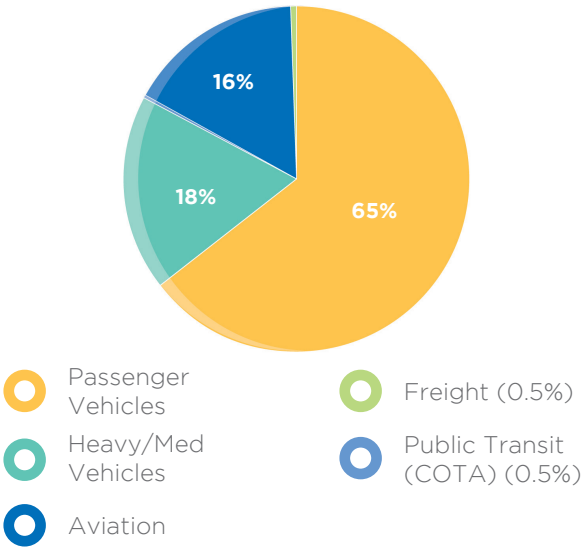
WATER & WASTE

Water and waste infrastructure are essential human needs. While the impact of these together is much lower than the energy or transportation sectors, it should not be overlooked for future planning and responsible allocation of resources. Both of these sectors should be closely managed in relation to future population growth. Regionally, a waste characterization study conducted by SWACO in 2019 found that 76% of materials thrown away have the potential to be recycled or composted.

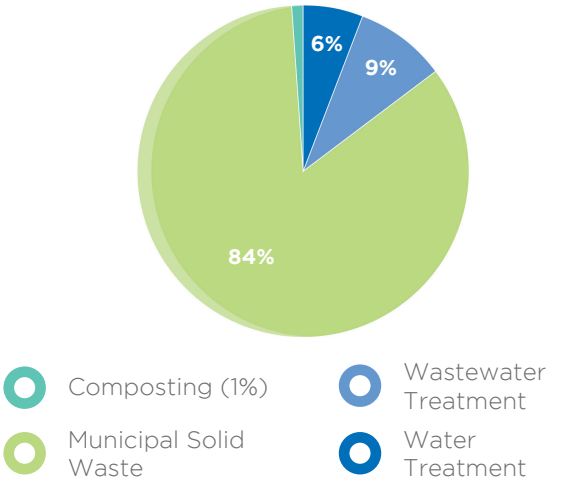
2013 ENERGY EMISSIONS



2013 TRANSPORTATION EMISSIONS



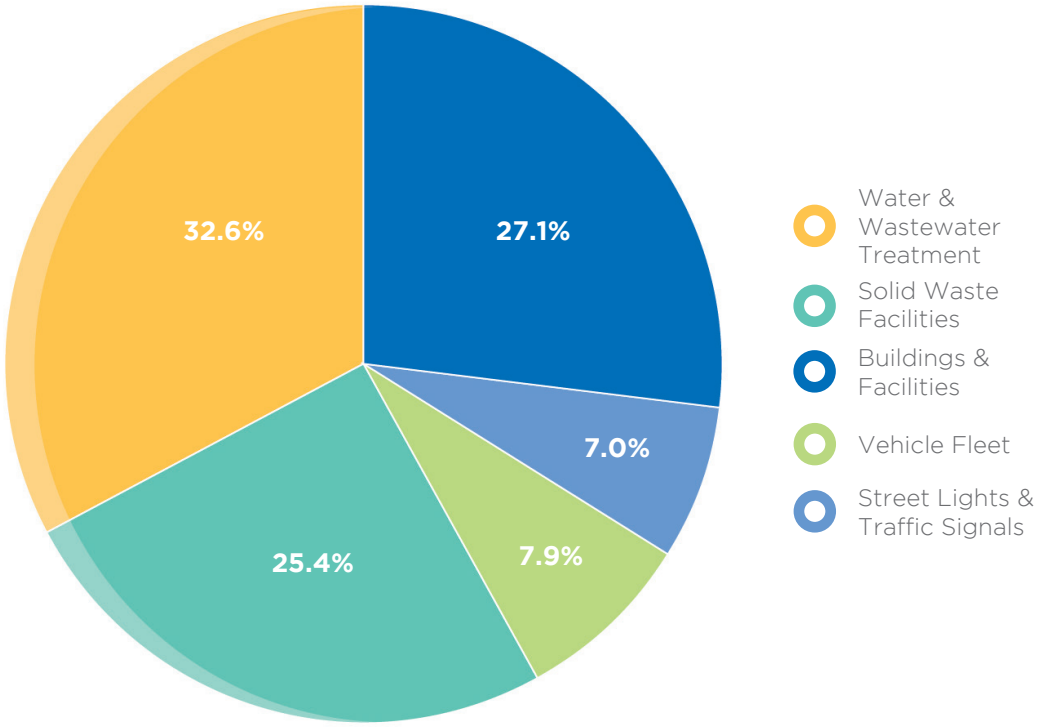
2013 WATER & WASTE EMISSIONS



GOVERNMENT GHG INVENTORY

While the municipal facilities and operations account for less than 4% of the total community 2013 GHG inventory; it is important to highlight these areas where City departments have the most influence and control to lead by example.

MUNICIPAL 2013 GHG INVENTORY



1/4
of municipal greenhouse gases come from buildings & facilities



Image Source: MKSK

GREENHOUSE GAS REDUCTION ANALYSIS

Using the ICLEI Clearpath tool, GHG emissions pathways were developed to analyze future scenarios. There is a scenario developed to reflect the changes in GHG emissions for implementing the Climate Actions of this plan, and a No Further Action scenario assuming that no actions beyond Fall 2021 are implemented. No Further Action only includes reductions from the CCA program, municipal on-site renewable energy programs that currently have signed contracts, and electric grid emissions from the 2018 RFC West subregion remaining constant.

GROWTH SCENARIOS

To build out the trajectory of emissions, annual population growth and grid emissions factors each utilize an annual growth projection based on the most currently available data. For the CAP, population data for growth percentages was provided from Insight 2050 and MORPC specific to the City of Columbus municipal limits.

Grid emissions data utilizes assumptions about how fossil fuels will be replaced with clean sources in the future (further outlined in Appendix C). Since HB6 was passed, the State of Ohio effectively does not have a renewable portfolio standard (RPS) to inform the growth scenario. It is expected that eminent federal grid decarbonization targets will drive these reductions, and will be reevaluated with all future CAP updates.

PROJECTED GHG EMISSION CHANGES

	2030	2050
No Further Action	+20%	+39%
CAP Actions	-45%	-100%

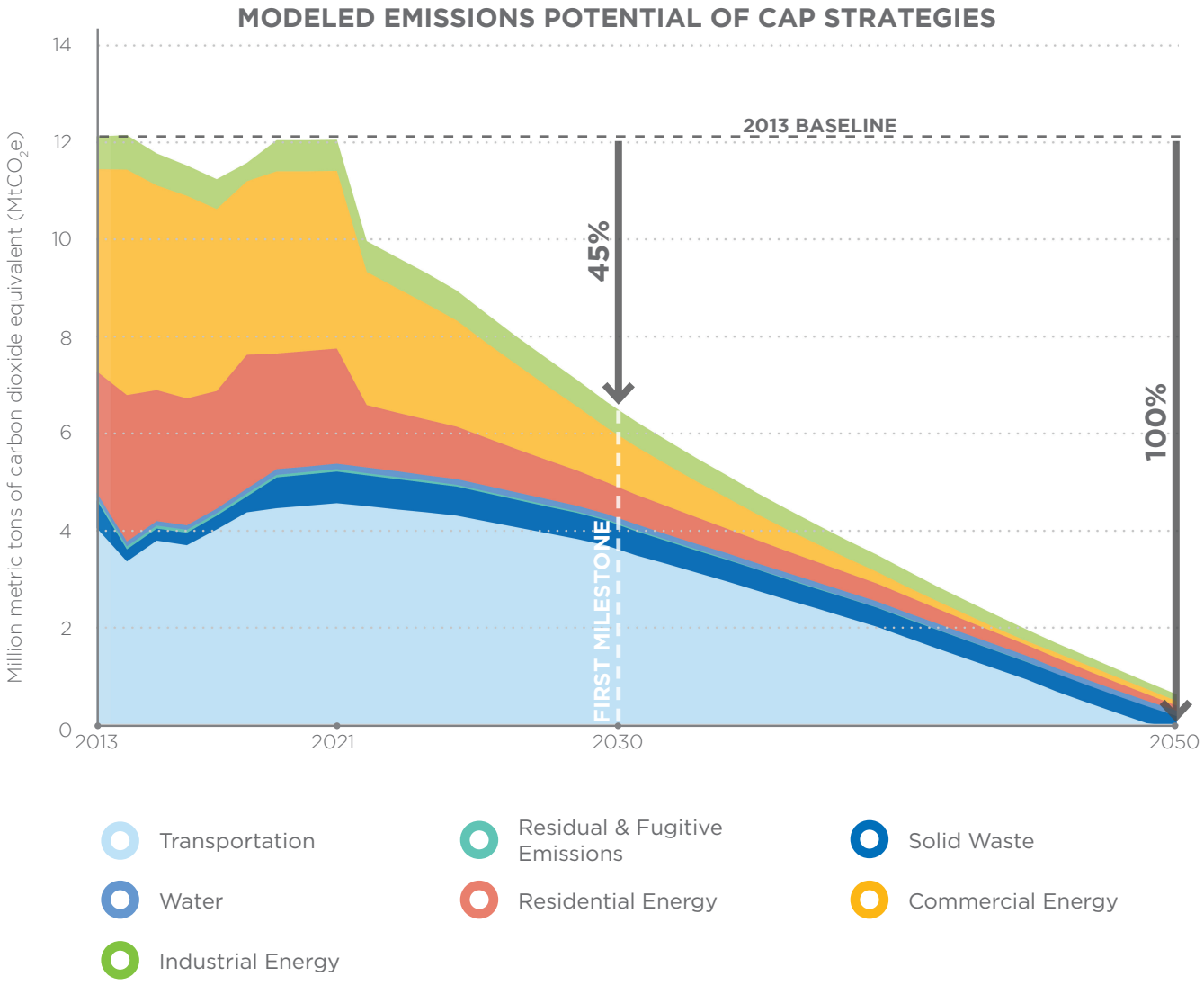
As shown in the Projected GHG Emissions Reduction table, if the No Further Action scenario were to occur, community GHGs would increase 20% by 2030 and 39% by 2050 as compared to the 2013 Baseline.

REALM OF CITY CONTROL

The City of Columbus must operate within its realm of control in relation to regulatory measures that are governed in Ohio at the state level. This includes building codes for energy efficiency standards, and renewable energy generation mandates from a RPS. To achieve carbon neutrality, the electric grid emissions will play a very large role in the speed overall GHG emissions are reduced. All future CAP updates will strategically review grid emissions decarbonization progress, and realign clean procurement contracting goals accordingly.

MODELED ACTIONS

The strategies in this Plan have been projected for future impact with GHG modeling tools. The forecasted measures with direct impacts currently model a 38% reduction by 2030; which will be reviewed and revised in Ambition 2025 to update strategies to achieve the 45% reduction target by 2030.


MODELED EMISSIONS POTENTIAL OF CAP STRATEGIES
Million metric tons of carbon dioxide equivalent ($MtCO_2e$)
14
12
10
8
6
4
2
0
2013
2021
2030
2050
2013 BASELINE
45%
100%
FIRST MILESTONE
Transportation
Residual & Fugitive Emissions
Solid Waste
Water
Residential Energy
Commercial Energy
Industrial Energy

MITIGATION AND ADAPTATION

While the overarching goal of our CAP is to mitigate our GHG emissions and develop a blueprint for accomplishing our 2050 carbon neutrality goal, it would be short-sighted to ignore the impacts of climate change that we have already experienced, will continue to experience and how these disproportionately impact the community. As recently as May 2020, Columbus experienced record-breaking rainfall that led to substantial flooding throughout the City and the Central Ohio region. These types of events are likely to become more intense and more frequent, testing the capacity of our stormwater infrastructure. This plan seeks to identify critical opportunities for the City to address both the cause and effect of climate change.

Mitigation refers to efforts to reduce the root cause of the problem - greenhouse gas emissions. The IPCC defines mitigation as "human intervention to reduce the sources or enhance the sinks of greenhouse gases." These mitigation efforts include most of the actions described in this plan: reducing energy use and increasing energy efficiency, switching to alternative fuels and clean energy supply, or promoting the use of low- or zero emission vehicles, to name a few.

On the other hand, adaptation is the terminology used when discussing efforts to address the effects of climate change. The IPCC defines adaptation as "the process of adjustment to actual or expected climate and its effects." These effects include changes in rainfall patterns, leading to more extreme flooding or more intense drought impacts; rising temperatures; and more severe storm events.

The reality is that we have to adapt. The climate is already changing, and we are past the point where mitigation can fully prevent the impacts of climate change. Mitigation efforts can stem the magnitude of the impacts, but adaptation efforts will need to go hand-in-hand with mitigation in order to truly prepare for a more sustainable and resilient Columbus.

By considering both the cause and effect of climate change concurrently, we can create synergies between the proposed mitigation and adaptation strategies, leverage co-benefits, and increase cost-effectiveness. This holistic and forward-thinking approach to Columbus' climate policy will allow for opportunistic integration of strategies and lead to more desirable outcomes for the City.



ad·ap·ta·tion

the process of adjustment to expected climate and its effects

mit·i·ga·tion

human interventions to reduce the sources of greenhouse gases

May 2020 Columbus flood event, rescue photo from Stormcroft Ave.

FUTURE CLIMATE

In 2016, the Great Lakes Integrated Sciences and Assessments (GLISA) in partnership with the City of Columbus, The Ohio State University (OSU), the Natural Resources Defense Council, The Columbus Foundation, and the City's Green Team and Climate Change Working Group, prepared the "Climate Change in Columbus Ohio" report. While climate change is largely considered a global issue, the impacts are local, resulting in unique vulnerabilities and risks for each community. The report outlines the anticipated climate impacts and identifies the primary vulnerabilities and risks to the City resulting from those climate impacts. The two major climate hazards that are likely to have the most impact on the City of Columbus are rising temperatures and increasing precipitation.

Columbus' climate is warming faster than the national average, and in particular, low temperatures are warming faster than high temperatures based on historical data from 1951-2012:

- **Annual average temperatures warmed by 2.3˚F**
- **Average low temperatures warmed by 3.6˚F**
- **Average growing season (freeze-free period) increased by 25.5 days**

These trends are expected to continue, and by 2050, Columbus could experience up to 5˚F warmer temperatures on average. Similarly, precipitation totals are increasing dramatically during the wet seasons in Ohio.

ANTICIPATED COLUMBUS CLIMATE IMPACTS

- Longer Growing Season
- Deteriorated Air Quality
- Extreme Heat
- Shifting Natural Resources
- Deteriorated Water Quality
- Increased Flood Risk
- Changing Seasonal Precipitation
- Changes to Water Availability

In particular, the Midwest is experiencing more frequent and intense rainfall events, as evidenced by the recent rainfall event on May 19, 2020 that led to significant flooding in Columbus and the surrounding region. The region has seen an approximate 36% increase in rainfall during the heaviest precipitation events when compared to historical averages.

In order to assess the potential impacts on Columbus as a result of these climate changes, the Great Lakes Integrated Sciences and Assessments (GLISA) team reviewed these changes against the unique characteristics of the City of Columbus, including shifting demographics, aging infrastructure, changing land uses, effects on natural resources, and atmospheric pollution.

CLIMATE ADAPTATION TO DATE

The "Climate Change in Columbus Ohio" report forms the foundation of our understanding of the key climate change hazards, impacts, and vulnerabilities to the City of Columbus. Following the release of that foundational report, The OSU Byrd Polar and Climate Research Center conducted a more in-depth assessment of Columbus' future climate risks, resulting in the "Columbus Climate Adaptation Plan" released in December 2018.

This CAP used the actions identified in the "Columbus Climate Adaptation Plan" as the foundational basis for the adaptation actions and strategies. This academic report provided a high level baseline with necessary and aspirational designations to the actions, from which further prioritization and responsibilities were assigned through actions of the CAP.

Wherever possible, the adaptation strategies in this plan build upon existing initiatives and leverage ongoing work currently underway by various departments within the City of Columbus. This is intended to identify opportunities and synergies that will allow for more efficient and effective implementation of the recommended adaptation strategies and actions.

OHIO FUTURE CLIMATE

Based on temperature, humidity and precipitation

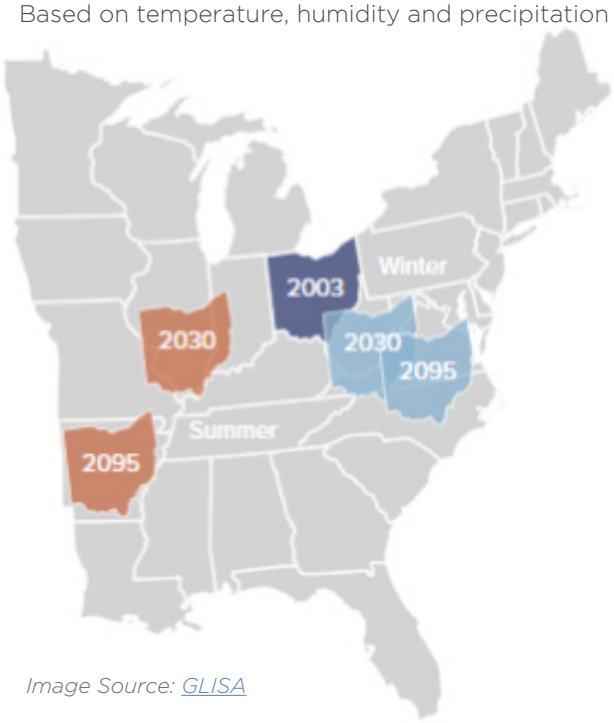


Image Source: GLISA

Modeling projections anticipate that Ohio summers will resemble a climate similar to current day Arkansas and Louisiana (shown in red), and winters will resemble a climate more similar to current day Virginia (shown in blue).

EXPECTED BENEFITS

Climate change mitigation and adaptation actions contribute to a wide variety of benefits for the communities where they are implemented. These benefits typically span multiple sectors and include improvements to public health and air quality, social equity, environmental quality, economic prosperity, and local workforce opportunities. In order to assess the true value of the actions recommended in the Sustainable Columbus Plan, an analysis of expected benefits was conducted and used to inform the recommended strategies and actions as well as the prioritization of those strategies.

A literature review of peer cities formed the foundation for the development of expected benefit categories that aligned with Columbus' climate action goals and community priorities. The approach is intended to help the City balance the emissions reduction potential of each of the strategies with the priorities of the community as a whole to ensure the plan meets the City's wide-ranging expectations and desired outcomes. Each action of the plan were evaluated for contributions to each of the expected benefit categories. Further information, including the scoring approach and results, are available in Appendix D.

A suite of questions was developed for each of the expected benefits categories that were the most appropriate for addressing Columbus' community priorities. The following section outlines the expected benefits categories and associated questions.



Climate Justice: equitable distribution of benefits from climate action planning across the diverse community



Human Health: improves public health through reduced pollutants and hazards, and increasing active habits



Environmental Quality: preserves and improves natural ecosystems and promotes biodiversity



Economic Prosperity: provides opportunity for funding revenue streams, reduced or stable energy costs, and/or job creation

CLIMATE JUSTICE
Is it affordable and/or does it reduce cost-burden on lower income residents?
Does it build stronger communities and improve accessibility to increase community participation?
Is it inclusive and does it expand access to community infrastructure (e.g. access to walking/biking paths, public transit, clean energy, affordable housing, etc.)?
Does it address historical disparities and cultural differences?
Does it limit displacement of residents and small businesses (due to rising property values, etc.)?
Does it lead to lower energy bills for owners, tenants and building occupants?
HUMAN HEALTH
Does it improve the quality of indoor spaces ?
Does it encourage physical activity?
Does it increase public safety, including reducing traffic accidents?
Does it increase access to quality, healthy food?
Will it help improve mental health of residents?
Does it benefit health outcomes, leading to reduced citywide healthcare costs?
ENVIRONMENTAL QUALITY
Does it improve outdoor air quality?
Does it reduce noise and/or light pollution?
Is it environmentally sustainable?
Does it promote smart behavior changes that reduce GHG footprint?
Does it increase ecosystem services by preserving and restoring land, protecting waterways/wetlands/wildlife habitat, or preventing sewage discharges?
ECONOMIC PROSPERITY
Does it have a positive economic impact on local businesses and for residents?
Does it create local, well-paying, high-quality jobs?
Does it increase access to quality jobs and improve workforce diversity?
Does it increase connectivity to jobs and education opportunities throughout the region?
Does it enhance employment security?
Does it lead to long-term energy savings and lower operating and maintenance costs for businesses, institutions, and municipal facilities?
Does it mitigate the risk of property damage to city infrastructure?



CLIMATE ACTIONS

SUMMARY ACTION MATRIX

The matrix on the following pages is a summary of the 13 strategies and key actions with quantifiable tracking targets.

LEGEND

GHG IMPACT

- Indirect
- Low
- Medium
- High

COST

- **$** Low
- **$$** Medium
- **$$$** High

EXPECTED BENEFITS

- None
- Some
- Moderate
- Major

LEAD AGENCY

- **BLDG** Building & Zoning
- **COTA** COTA
- **EDEV** Economic Development
- **FIN** Finance & Management
- **MAYR** Mayor's Office
- **MOR** MORPC
- **HLTH** Public Health
- **SERV** Public Service
- **UTIL** Public Utilities
- **REC** Recreation & Parks
- **SMRT** Smart Columbus
- **SUST** Sustainable Columbus
- **SWC** SWACO

GHG Reductions by 2030

Indirect: no quantifiable GHG emissions in metric tons (MT)
Low: Less than 20,000 $MTCO_2e$
Medium: 20,000 - 200,000 $MTCO_2e$
High: More than 200,000 $MTCO_2e$

Implementation Cost by 2030

Low: $0 - $500,000
Medium: $500,000 - 1,000,000
High: $1,000,000+

Community-wide benefit impacts in addition to GHG reductions.

City and partner agency assignments that will be responsible for tracking progress metrics and coordinating implementation programs.

ACTION		GHG IMPACT	COST		EXPECTED BENEFITS				LEAD
			City	Non-City	Climate Justice	Environmental Quality	Human Health	Economic Prosperity	
CLIMATE SOLUTIONS: THE COLUMBUS WAY									
1 | Empower a Community of Climate Leaders									
1.1	Incorporate climate action programs into Green Spot		$	-	●	●	◑	◑	SUST
2 | Develop a Clean Energy Economy									
2.1	Support green business initiatives		$	-	◑	◑	◑	●	EDEV
2.2	Increase annual sustainable development funding		$	$	◑	◑	◑	●	EDEV
3 | Enhance Partnerships for Preparedness Efforts									
3.1	Develop a regional adaptive management strategy		$$	$	◑	◑	◑	◑	MOR
3.2	Advocate for state policies that align with low carbon, resilient solutions		$	$	◑	●	◑	●	MAYR
3.3	Ambition 2025	●●●	$	$	●	◑	◑	◑	SUST
SUSTAINABLE NEIGHBORHOODS									
4 | Support a Healthy and Resilient Community									
4.1	Establish coordinated network of resilience hubs		$$	-	●	◑	●	◑	HLTH
4.2	Establish regional emergency alert system for climate hazards		$$	$	◑	◑	◑	●	HLTH
5 | Implement Land Use Planning Strategies for Healthy Ecosystems									
5.1	Increased development density	●●○	$$	$$	◑	◑	◑	◑	BDZN
5.2	LED streetlight retrofit	●○○	$$$	-	◑	●	◑	◑	UTIL
5.3	Increase equitable access to green space		$$$	-	●	●	◑	◑	REC
5.4	Implement water adaptation strategies		$$	$	●	●	◑	◑	MOR

	ACTION	GHG IMPACT	COST		EXPECTED BENEFITS				LEAD
			City	Non-City	Climate Justice	Environmental Quality	Human Health	Economic Prosperity	
	SUSTAINABLE NEIGHBORHOODS								
	6 | Prepare for Warmer and Wetter Seasons								
6.1	Assess and protect assets from the impacts of climate change		$$	$					SERV
6.2	Reduce urban heat with tree canopy cover		$$	$					REC
6.3	Evaluate microgrid + storage projects		$$	$$					UTIL
	BUILDINGS								
	7 | Increase Renewable Energy								
7.1	Increase residential on-site solar	●	$$	$$					BDZN
7.2	Increase commercial on-site solar	●●●	$	$$					SMRT
7.3	Implement clean energy procurement	●●●	$	$					SUST
	8 | Increase Building Efficiency								
8.1	Increase energy efficiency	●●●	$$$	$$					BDZN
8.2	Increase water efficiency	●	$	$					UTIL
	9 | Adopt Net Zero and Resilient Building Standards								
9.1	Prototype zero carbon buildings		$$	$$$					FIN
9.2	Adopt resilience standards		$	$$					BDZN

ACTION		GHG IMPACT	COST		EXPECTED BENEFITS				LEAD
			City	Non-City	Climate Justice	Environmental Quality	Human Health	Economic Prosperity	
TRANSPORTATION									
10 | Enable Carbon Free Vehicles									
10.1	Increase private ZEV adoption	●●●	$	$$	◑	●	◑	◑	SMRT
10.2	Implement ZEV fleets	●●●	$$	$$	◑	●	◑	●	SMRT
10.3	Promote medium/heavy duty ZEV adoption	●●○	$$	$$$	◑	●	◑	●	SMRT
11 | Support Equitable Mode Shift									
11.1	Implement comprehensive multi-modal network	—	$$$	$	◑	◑	●	◑	SUST
11.2	Reduce single occupant vehicle miles traveled	●●●	$	$	◑	●	◑	◑	SERV
11.3	Increase transit use	●○○	$$	$	◑	◑	◑	◑	COTA
11.4	Support active transportation infrastructure	—	$	$$	◑	◑	●	◑	SERV
WASTE									
12 | Reduce Waste Generated									
12.1	Reduce landfilled organic waste	●●○	$$	$	◑	●	◑	◑	SERV
12.2	Reduce recyclable waste sent to the landfill	●●○	$	$	◑	●	◑	◑	SERV
13 | Increase Waste Diversion Rate									
13.1	Support circular economy organizations	—	$$	$	◑	●	◑	●	SWC

NAVIGATING THE CLIMATE ACTIONS

See the graphic below for assistance on reading and understanding the components of the CAP and their meaning.

1. **Section**. The climate actions are grouped into five sections.
2. **Strategies**. Each section outlines the strategies for climate action.
3. **Actions**. Each action is numbered in relation to the strategy it is contributing.
4. **Summary**. Overview of the action purpose.
5. **Description**. Further detail on the action background information and quantification of tracking progress.
6. **Targets.** Numerical goals for each action with an assigned timeline.
7. **GHG Impact**. The estimated level of GHG emissions reduction from mitigation in metric tons (MT) of CO_2e. Full calculation details on each action are available in Appendix C.
8. **Leadership**. Agencies that have the authority as Lead Agency to guide overall progress, and Implementing Partners that will be necessary for meeting targets.
9. **Expected Benefits**. Level of impact on each of the four categories. Full assessment of benefits are available in Appendix D.



1

BUILDINGS

Columbus' buildings are a major consumer of energy from the local utilities and the largest single source of GHG emissions community-wide; they must be fine-tuned to optimize each kilowatt of energy used. By 2050, buildings must be carbon neutral operating on 100% clean power to achieve the CAP goals.

Buildings can be built and renovated using net-zero design standards, high efficiency systems, passive strategies and low carbon materials to first reduce the energy needed; and second generate clean energy on-site to meet the reduced demand.

2

STRATEGIES

7. Increase Renewable Energy
8. Increase Building Efficiency
9. Adopt Net Zero and Resilient Building Standards

7.1 INCREASE RESIDENTIAL ON-SITE SOLAR

ROOFTOP SOLAR PHOTOVOLTAIC (PV) PANELS GIVE RESIDENTS THE MOST DIRECT ACCESS TO CLEAN ENERGY

With the regional grid using a significant amount of fossil fuel electric generation, Columbus citizens will get the most reliable clean energy source directly from their own roof and credited to their utility bills through net metering. As the grid is anticipated to integrate more renewable energy and clean generation, the costs of PV systems are expected to continue falling. In the interim, bulk purchasing and incentives should be utilized to spur more adoption.



Image Source: Third Sun Solar

TARGETS (6)
20 MW installed by 2030
500 MW installed by 2050

GHG IMPACT (7)	
2030 Reduction	Low - 19,629 MT
2050 Reduction	Low - 2,964 MT

AGENCIES INVOLVED (8)	
Lead Agency	Building and Zoning
Supporting Agencies	Public Utilities, , Sustainable Columbus

EXPECTED BENEFITS (9)
Climate Justice
some
Environmental Quality
major
Human Health
moderate
Economic Prosperity
some



CLIMATE SOLUTIONS: THE COLUMBUS WAY

Working with public, private, and non-profit sector collaboration, utilizing local academic and organizational institutional knowledge, as well as with neighboring communities is nothing new for Columbus. This experience will be leveraged to implement further plans, policies and agreements to put the necessary tools and training in place for successful climate action to achieve carbon neutrality for the community members that will be thriving here in 2050.

STRATEGIES

1. Empower a community of climate leaders
2. Develop a clean energy economy
3. Enhance partnerships for preparedness efforts



1

EMPOWER A COMMUNITY OF CLIMATE LEADERS

Every individual action matters, but a groundswell will accelerate tangible outcomes

1.1 INCORPORATE CLIMATE ACTION PROGRAMS INTO GREENSPOT

ADAPT GREENSPOT OUTREACH INITIATIVES TO INCREASE CLIMATE CHANGE AWARENESS TO RESIDENTS, BUSINESSES AND ORGANIZATIONS

GreenSpot has already engaged over 20,000 community residents. Continued growth and participation in the GreenSpot program will support the CAP and priority actions. Engagement from successful outreach generates valuable community stories which are best told from one neighbor or business owner to another.

To track progress, engagement logs from training events and a running lists of community partner commitments from businesses and organizations will be regularly reviewed by the implementation team for equitable impacts throughout the city.



GreenSpot tree planting event.

TARGETS
200 training events by 2030
1,000 new community partner signatory commitments by 2030

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

LEADERSHIP	
Lead Agency	Sustainable Columbus
Implementing Partners	Smart Columbus, Neighborhoods

EXPECTED BENEFITS
Climate Justice
major
Environmental Quality
major
Human Health
moderate
Economic Prosperity
moderate

2

DEVELOP A CLEAN ENERGY ECONOMY

Upfront investment in clean energy creates long-term skilled jobs with living wages

2.1 SUPPORT GREEN BUSINESS INITIATIVES

PROVIDE CRITICAL RESOURCES TO SPUR JOB CREATION

Providing good paying jobs that can support families in our community is critical for Columbus. Climate action provides huge job creation and work opportunities. The scale of transformation needed across Columbus will need innovative local community members to deploy new technologies, building system retrofits, transportation and waste management solutions throughout the city. Small business workshops, start-up funding and promotion are critical to standing up a strong local business community.

There is no one universally accepted definition for 'green jobs.' The City will work to establish green job qualifications and accurate annual tracking procedures.

"If I have to switch careers because of climate change, that will mean more school, more debt, and a longer time before I can properly rejoin the workforce. I want to be able to work, I don't want to give up on my dreams, I want to be able to afford a home, I want to be able to pay my bills, but **I don't see that future existing without aggressive action on climate change, environmental justice, affordable housing, and fair wages.**"

Faye Clark,
Northwest Columbus
Area Resident

TARGETS
10,000 new green jobs by 2030

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

LEADERSHIP	
Lead Agency	Economic Development
Implementing Partners	One Columbus, Sustainable Columbus, Smart Columbus, Neighborhoods

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
some
Human Health
some
Economic Prosperity
major

2.2 INCREASE ANNUAL SUSTAINABLE DEVELOPMENT FUNDING

UTILIZE LOW COST SOLUTIONS FOR HIGH PERFORMANCE RETROFITS

While Columbus currently has great success with the property assessed clean energy (PACE) financing program, additional funding resources will need to continue increasing to meet the ambition of the CAP. The expansion of funding options with the development of a green bank or similar entity will increase equitable capital access to residential, commercial and industrial property owners.

These funding solutions ensure that renovation and development plans are associated with measurable energy, water and resilience benefits resulting in lower operational expenditures for owners and tenants, and create safer environments for where we live, work and learn.

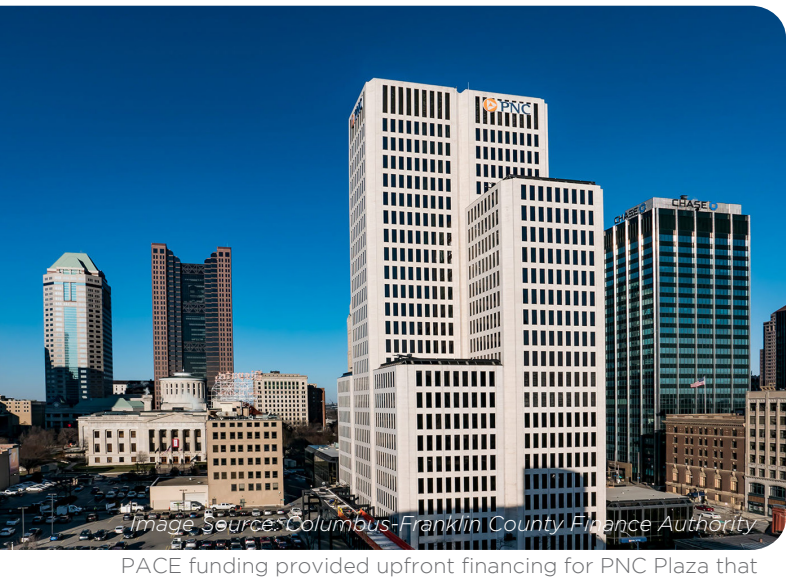


Image Source: Columbus-Franklin County Finance Authority

PACE funding provided upfront financing for PNC Plaza that have resulted in nearly $200,000 annual energy savings.

TARGETS
Establish a green bank by 2025
$250 mil average annual PACE investments by 2030

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

LEADERSHIP	
Lead Agency	Economic Development
Implementing Partners	Columbus-Franklin County Finance Authority, Smart Columbus

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
moderate
Human Health
some
Economic Prosperity
major

3

ENHANCE PARTNERSHIPS FOR PREPAREDNESS EFFORTS

Appropriately allocate shared resources to maximize future outcomes for the greater community

3.1 DEVELOP A REGIONAL ADAPTIVE MANAGEMENT STRATEGY

STRATEGIC PROGRAM IMPLEMENTATION TO BEST APPROPRIATE RESOURCES ACROSS THE GREATER MUNICIPAL AREA

Climate change impacts do not respect municipal boundaries. Unintended impacts from adjacent areas can be mitigated with preventative management plans at a regional scale with proper collaboration. Neighboring jurisdictions will have similar future climate impacts, but different infrastructure and personnel response policies.

These strategies are intended to respond to changes in extreme temperatures, severe storms, flooding, air quality and soils to advance solutions to promote a future restorative and regenerative habitat. Working together can streamline priority areas for equitable response and enable proactive solutions that can benefit the wider community.



Image Source: Franklin Soil and Water Conservation District

TARGETS
Prioritized strategies outlined by 2025
Implement short-term strategies by 2030
Implement long-term strategies by 2050

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

LEADERSHIP	
Lead Agency	MORPC
Implementing Partners	Public Utilities Columbus Fire & Police, Franklin County

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
some
Human Health
some
Economic Prosperity
moderate

3.2 ADVOCATE FOR STATE POLICIES THAT ALIGN WITH LOW CARBON, RESILIENT SOLUTIONS

WORK TOGETHER AT THE CITY LEVEL TO INFLUENCE STATE AND FEDERAL CHANGES

The City of Columbus represents one of multiple layers of government. As such, different aspects are directly or indirectly in the realm of control to direct policy changes. Building codes and renewable energy portfolio standards (RPS) are two important state-level policies that are critical to the CAP which will require diligent efforts to ensure progressive changes are made.

A state level RPS will set goals for the electric utility companies to develop clean energy sources from in-state resources that are carbon free. This is critical as many fossil fuel sources are reaching the end of their expected useful lifespan and will need replaced.

Building codes for renovations and new construction follow standards adopted by the Ohio Board of Building Standards, which also include specific energy code requirements. Energy code updates are not currently structured on a set review period, similar to the overall building code updates. Current commercial energy code compliance pathways reference standards that are at least nine years old. Updating energy codes will provide the community energy cost savings and carbon emission reductions.

TARGETS
Reinstate 20% renewable portfolio standard by 2030
Establish an energy code review cycle by 2030

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

LEADERSHIP	
Lead Agency	Mayor's Office
Implementing Partners	Building and Zoning, Finance

EXPECTED BENEFITS
Climate Justice
some
Environmental Quality
major
Human Health
moderate
Economic Prosperity
major

3.3 AMBITION 2025

IDENTIFY ACTIONS FOR GREATER EQUITABLE IMPACT AND ENSURE FUTURE SUCCESS

Our community is committed to ambitious action to ensure we are imparting equity, environmental justice, improving the lives of our residents and ensuring a just, healthy future. The latest 2021 IPCC report underscores the need for urgent action on climate, and how critical it is for communities to take their fair share of action to reduce emissions.

Knowing that both our community and climate science will continue to evolve, this measure will be able to adapt and reflect the necessary changes over time. This will help keep our community accountable, transparent, nimble, and pushing ourselves to achieve a just future for all residents in Columbus.

TARGETS
Outline 7% increase to GHG modeling reduction by 2025
Implement reduction strategies by 2030
Implement long-term strategies by 2050

GHG IMPACT	
2030 Reduction	High - 720,000 MT

LEADERSHIP	
Lead Agency	Sustainable Columbus
Implementing Partners	MORPC, Smart Columbus, Finance, Service, Building & Zoning, Public Utilities

EXPECTED BENEFITS
Climate Justice
major
Environmental Quality
moderate
Human Health
some
Economic Prosperity
some





SUSTAINABLE NEIGHBORHOODS

Columbus has a diverse mix of neighborhoods offering residents a unique sense of pride and ownership. Affordable, safe and resource efficient communities are necessary throughout Columbus. Responsible solutions to reduce unsheltered populations, provide equitable access to transportation and services, and connectivity to good jobs will be required to sustain a thriving community in the face of climate change.

STRATEGIES

4. Support a healthy and resilient community
5. Implement land use planning strategies for healthy ecosystems
6. Prepare for warmer and wetter seasons


E Welch Ave
4th St
ONE WAY
2249
8

4

SUPPORT A HEALTHY AND RESILIENT COMMUNITY

Hyper local connections develop trust and knowledge sharing

4.1 ESTABLISH COORDINATED NETWORK OF RESILIENCE HUBS

COMMUNITY RESOURCE CENTERS CAN CREATE STRONG COMMUNICATION CHANNELS

Every neighborhood is unique, and as such the needs of its members vary. The development of localized resilience hubs can respond to its community depending on the situation. Whether it is natural disasters or utility outages, a trusted community member will know how to reach and assist its most vulnerable citizens.

Shifting power and capacity to communities can help reduce stress on systems and infrastructure that often have a legacy of discriminatory underfunding in low-income communities, while building the communities adaptive capacity to work together and build a stronger support systems. Resilience hubs operate in multiple modes but can serve as cooling centers for heat emergency days, conditioned shelters for utility outages and safe food and water distribution centers in a recovery mode after disruptions.

Building from the lessons of the Linden Recreation Center, outlining additional communities that will most greatly benefit from resilience hubs and a community engagement plan to implement additional community resources will be required.

TARGETS
Develop an implementation plan for priority resilience hub locations by 2025
Implement resilience hubs within a 15 min walk for all residents by 2050

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

LEADERSHIP	
Lead Agency	Public Health
Supporting Agencies	Public Service, Neighborhoods, Public Safety, Rec & Parks, Technology

EXPECTED BENEFITS
Climate Justice
major
Environmental Quality
some
Human Health
major
Economic Prosperity
some

4.2 ESTABLISH REGIONAL EMERGENCY ALERT SYSTEM FOR CLIMATE HAZARDS

ENSURE THAT ALL RESIDENTS WILL RECEIVE TIME SENSITIVE WARNINGS IN MANNER THAT WILL BE ACCESSIBLE TO ALL

Communication services live in many platforms in our digital world today. To best serve the citizens, collaboration between city and county departments that handle emergency response would be optimized to ensure major and minor natural or human caused events would be automated, eliminating any gaps in service between jurisdictional boundaries. The emergency management plans to support the alert system should include transportation resources, evacuation and shelters at a neighborhood level.



Image Source: ODOT

TARGETS
Implement a regional alert system for climate hazards by 2025

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	Public Health
Supporting Agencies	Technology, Public Safety, Emergency Management

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
some
Human Health
some
Economic Prosperity
major

5

IMPLEMENT LAND USE PLANNING STRATEGIES FOR HEALTHY ECOSYSTEMS

As the city human population grows, balanced planning decisions become even more important

5.1 INCREASE DEVELOPMENT DENSITY

STRATEGICALLY MANAGE POPULATION GROWTH TO MINIMIZE CLIMATE IMPACT

Denser development of the built environment with safe multi-modal access to jobs, schools, goods and services and recreation must achieved in response to the growing population. Employment centers throughout the city must have transit connectivity and infrastructure to support safe walking and bicycling. These future developments must also ensure that a diverse representation of the community are included in early planning processes.

Redevelopment of vacant and infill properties often results in locations that already have access to transit and human powered transport options, and also will reduce pressure on undeveloped areas, preserve natural spaces and provide areas for urban farming and outdoor recreation.



Image Source: Franklinton Farms

TARGETS
Establish vacant property redevelopment targets by 2025
40% of new housing is within 1/4 mile of employment centers by 2030
60% of new housing is within 1/4 mile of employment centers by 2050

GHG IMPACT	
2030 Reduction	Low - 11,088 MT
2050 Reduction	Med - 20,284 MT

AGENCIES INVOLVED	
Lead Agency	Building and Zoning
Implementing Partners	Public Service, Planning

EXPECTED BENEFITS
Climate Justice
some
Environmental Quality
some
Human Health
moderate
Economic Prosperity
moderate

5.2 LED STREETLIGHT RETROFITS

INVESTMENT IN FIXTURE UPGRADES HAS POSITIVE ENVIRONMENTAL, SOCIAL AND FINANCIAL BENEFITS

Lighting represents a significant portion of the City's municipal greenhouse gas emissions, and provide a vital safety service for the community. New light emitting diode (LED) lamps are now available in environmentally friendly color rendering indexes, provide longer lamp life for reduced maintenance, and typically reduce energy consumption of each fixture by at least 70%.

City implementation plans will prioritization this investment as existing fixtures reach end of life. The longer useful life and reduced maintenance hours will allow resources to be redistributed.



Image Source: MKSK

TARGETS
100% LED streetlights by 2030

GHG IMPACT	
2030 Reduction	Low - 8,572 MT
2050 Reduction	Low - 129 MT

AGENCIES INVOLVED	
Lead Agency	Public Utilities
Implementing Partners	AEP Ohio, Public Service, Finance, Technology

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
major
Human Health
some
Economic Prosperity
moderate

5.3 INCREASE EQUITABLE ACCESS TO GREEN SPACE

ACCESS TO SAFE OUTDOOR SPACES CREATE STRONG, HEALTHY COMMUNITIES

In line with Columbus' commitment to the 10 minute walk promise, this action will track progress and inform decisions to increase access to green spaces for all communities; prioritizing areas where there are the greatest disparities first. Green spaces tracked for this measure consist of parks, natural areas and connectivity corridors or greenways.

Where development density does not align, vacant properties can be utilized as urban gardens or places of respite for improved mental health. Preserving or restoring sufficient acreage of green space is also a proven climate adaptation strategy - reducing stormwater impacts from severe weather events and increasing tree canopy to sequester CO_2.



Livingston Park adjacent to the Southern Orchards neighborhood in the South Side neighborhood.

TARGETS
430 accessible green spaces by 2030
500 accessible green spaces by 2050
Access to green space within a 10 min walk for all residents by 2050

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	Rec and Parks
Implementing Partners	Planning, Building and Zoning

EXPECTED BENEFITS
Climate Justice
major
Environmental Quality
major
Human Health
moderate
Economic Prosperity
moderate

5.4 IMPLEMENT WATER ADAPTATION STRATEGIES

A RESILIENT WATER SUPPLY IS THE MOST CRITICAL HUMAN NEED FOR THE COMMUNITY

Clean water is a basic human need and must be provided to all residents, and is expected to have increased treatment demands in the future to meet growing population and development forecasts in Columbus. In addition to clean, potable water the demands on stormwater and sewage infrastructure are also projected to greatly increase.

The Sustaining Scioto regional plan outlines short-term and mid-term adaptation strategies that align with the time line of this plan. The City should work with local partners to ensure the water quality and supply will meet the growing future populations.



East Franklinton storm and sanitary pump station improvement project.

TARGETS
Implement short-term Sustaining Scioto strategies by 2025
Complete mid-term Sustaining Scioto strategies by 2050

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	MORPC
Implementing Partners	Public Utilities, Public Service, Planning

EXPECTED BENEFITS
Climate Justice
major
Environmental Quality
major
Human Health
some
Economic Prosperity
moderate

6

PREPARE FOR WARMER AND WETTER SEASONS

Healthy ecosystems can help slow changing weather patterns

6.1 ASSESS AND PROTECT ASSETS FROM THE IMPACTS OF CLIMATE CHANGE

BOTH CRITICAL INFRASTRUCTURE AND VULNERABLE POPULATIONS ARE ASSETS THE COMMUNITY MUST PRIORITIZE

Areas with insufficient stormwater control, poor water quality, and older electric utility infrastructure are often disproportionately aligned with vulnerable populations. To understand the intersection of this occurrence a physical vulnerability assessment should outline infrastructure systems with a geographic information system (GIS) to map demographics. The assessment should then prioritize investments based on potential impacts to reduce disparities between neighborhoods.

Infrastructure systems and components are only one part of the vital assets that allow a community to thrive. There would not be a community to support without the vibrant and diverse residents that define Columbus.

"Climate change matters to me because **I want my future and the future of my two young children to include a healthy and prosperous planet**. Without a stable environment, the challenges our society face will just become harder, conflicts will become more wide spread, and the natural beauty of the world will start to fade. It also matters to me because we have the power to change it, to be better, and to create a better world through our actions. **Let's embrace bold, smart change, and make it happen**."

Donald Murray,
Merion Village

TARGETS
Complete physical vulnerability assessment by 2025
Implement short-term assessment actions by 2030
Implement long-term assessment actions by 2050

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	Public Utilities
Implementing Partners	Public Service, Public Safety, Planning, Public Health

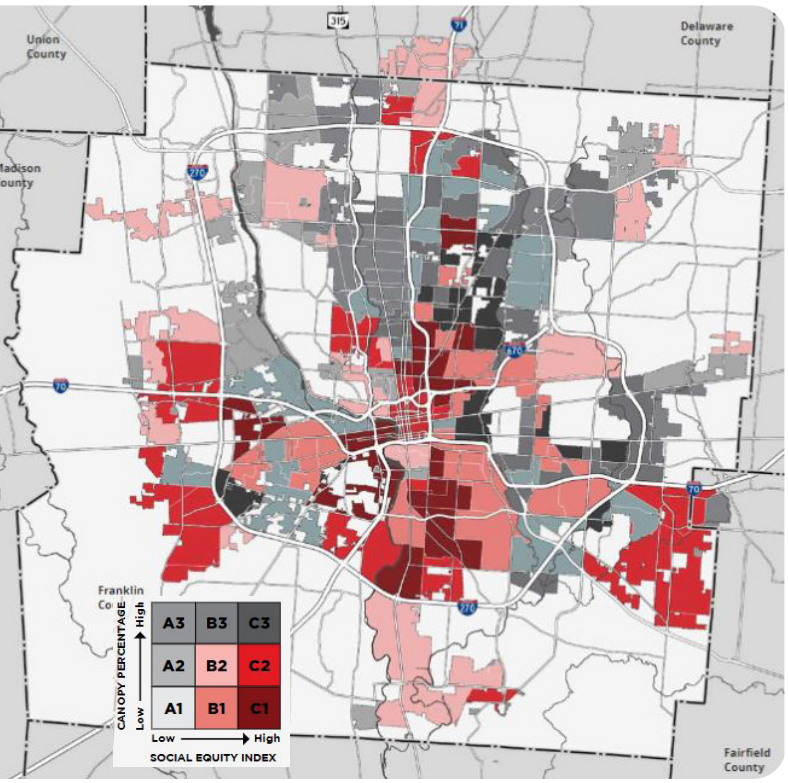
EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
major
Human Health
some
Economic Prosperity
moderate

6.2 REDUCE URBAN HEAT WITH TREE CANOPY COVER

TREES WILL ALSO HELP MANAGE STORMWATER AND CAN INCREASE PROPERTY VALUES

As of 2013, the tree canopy assessment found that the citywide average canopy cover was 22%, but the neighborhoods have unequal coverage ranging from 9-41%. The 2021 Urban Forestry Master Plan outlines the goals to first stop net tree canopy loss, then focus on priority neighborhoods where tree canopy percentages and social equity index numbers are lowest.

In addition to the indirect urban heat island benefits, tree planting has major benefits to community health including improvements in air quality, cardiovascular health and mental health.



Urban Forestry Master Plan Social Equity Factors

TARGETS
Invest in equitable canopy across all neighborhoods by 2030
Stop tree canopy net losses by 2030
40% city-wide tree canopy by 2050

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	Rec and Parks
Implementing Partners	Public Utilities, Public Safety, Planning, Public Health

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
major
Human Health
major
Economic Prosperity
some

6.3 EVALUATE MICROGRID + STORAGE PROJECTS

RETHINKING OUR CENTURIES OLD GRID INFRASTRUCTURE WILL ALLOW FOR IMPLEMENTING FUTURE TECHNOLOGIES

Electrification alone comes with increased infrastructure upgrades and improvement costs. Focusing efforts where upgrades can be centralized with shared interests to implement clean and low carbon reliable energy solutions will also increase resilience. Areas with vulnerable communities, critical healthcare demands or other facilities with 24/7 demands should be identified for pilot programs, and outline best practices for future adaptability for expansions or upgrades.



A 1,200 kWh battery energy storage system at the Columbus Zoo serves the critical saltwater life support for the polar bear exhibit.

TARGETS
Complete a microgrid and energy storage prioritization study by 2025
Implement 5 microgrid pilot projects by 2030

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	Public Utilities
Implementing Partners	Economic Development, AEP Ohio

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
some
Human Health
some
Economic Prosperity
moderate



BUILDINGS

Columbus' buildings are a major consumer of energy from the local utilities and the largest single source of GHG emissions community-wide; they must be fine-tuned to optimize each kilowatt of energy used. By 2050, buildings must be carbon neutral operating on 100% clean power to achieve the CAP goals.

Buildings can be built and renovated using net-zero design standards, high efficiency systems, passive strategies and low carbon materials to first reduce the energy needed; and second generate clean energy on-site to meet the reduced demand.

STRATEGIES

7. Increase renewable energy
8. Increase building efficiency
9. Adopt net zero and resilient building standards


LINDEN COMMUNITY CENTER
COLUMBUS
RECREATION AND PARKS
1350 BRIARWOOD AVENUE

7

INCREASE RENEWABLE ENERGY

Transitioning to a clean energy supply is critical on the path to a carbon neutrality target

7.1 INCREASE RESIDENTIAL ON-SITE SOLAR

ROOFTOP SOLAR PHOTOVOLTAIC (PV) PANELS GIVE RESIDENTS THE MOST DIRECT ACCESS TO CLEAN ENERGY

With the regional grid using a significant amount of fossil fuel electric generation, Columbus citizens will get the most reliable clean energy source directly from their own roof and credited to their utility bills through net metering. As the grid is anticipated to integrate more renewable energy and clean generation, the costs of PV systems are expected to continue falling. In the interim, bulk purchasing and incentives should be utilized to spur more adoption.

To improve access and equity to residential solar, the City Division of Power will be working to develop a community solar plan. This will allow residents that do not have a suitable rooftops for solar, such as renters, the benefits of clean energy sources and predictable energy prices.



Image Source: Third Sun Solar

TARGETS
Community Solar Plan by 2025
50 MW installed by 2030
500 MW installed by 2050

GHG IMPACT	
2030 Reduction	Low - 19,629 MT
2050 Reduction	Low - 2,956 MT

AGENCIES INVOLVED	
Lead Agency	Building and Zoning
Supporting Agencies	Public Utilities, , Sustainable Columbus

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
major
Human Health
some
Economic Prosperity
major

7.2 INCREASE COMMERCIAL ON-SITE SOLAR

COMMERCIAL ROOFTOP, PARKING CANOPY, AND GROUND MOUNT SYSTEMS ARE RELIABLE LONG TERM INVESTMENTS

Both municipal, private and non-profit commercial property owners can benefit from clean energy with on-site solar system installations. Depending on the location - rooftop, parking canopy, or ground mount systems could all be feasible systems in Columbus.

The business case for solar makes sense - with multiple options for financing a system, the savings from electric utility bills provide payback over the course of the systems lifespan. Outreach and implementation should focus on small businesses and marginalized community areas in addition to large building owners.

The City currently has multiple rooftop solar systems installed, with additional ground mount systems under contract for development.



The roof of Columbus' Fleet Management Facility is covered with 2,650 PV panels.

TARGETS
200 MW municipal installed by 2030
600 MW private installed by 2030
2 GW total installed by 2050

GHG IMPACT	
2030 Reduction	High - 316,955 MT
2050 Reduction	Low - 11,931 MT

AGENCIES INVOLVED	
Lead Agency	Smart Columbus
Implementing Partners	Public Utilities, Columbus Partnership, Economic Development

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
major
Human Health
some
Economic Prosperity
major

7.3 IMPLEMENT CLEAN ENERGY PROCUREMENT

PROCUREMENT OPTIONS ALLOW ALL COMMUNITY MEMBERS ACCESS TO CLEAN CHOICES REGARDLESS OF OWNERSHIP

Ohio's deregulated energy market allows for consumer choice in purchasing and sourcing energy, making it possible for both individuals and large entities to contract for 100% clean, renewable energy. Purchasing clean energy is most successful when economies of scale can be used to obtain the largest amount of power at competitive prices. The City successfully implemented it's Clean Energy Columbus aggregation program this past year which now gives eligible residents and small businesses the option to utilize 100% Ohio-based clean electricity .

City government, private businesses, and local organizations have commercial energy accounts. This means that they are able to procure clean energy options using either power purchase agreements (PPA) or renewable energy credits (RECs) for either an individual building or suite of buildings.

As the City and other entities build more renewable energy systems locally, there will be additional opportunity for local clean energy procurement. This will create Ohio jobs, and a healthier community.

TARGETS
100% municipal clean energy procurement by 2030
100% residential clean energy procurement by 2030
25% commercial clean energy procurement by 2030
100% commercial clean energy procurement by 2050

GHG IMPACT	
2030 Reduction	High - 924,222 MT
2050 Reduction	Med - 17,438 MT

AGENCIES INVOLVED	
Lead Agency	Sustainable Columbus
Implementing Partners	Smart Columbus, Finance, Public Utilities, Rec and Parks

EXPECTED BENEFITS
Climate Justice
some
Environmental Quality
major
Human Health
some
Economic Prosperity
some

8

INCREASE BUILDING EFFICIENCY

Energy efficiency improvements in existing buildings is the most cost-effective opportunity

8.1 INCREASE ENERGY EFFICIENCY

EXISTING BUILDING RETROFITS CAN OFTEN HAVE RETURN ON INVESTMENT PERIODS OF LESS THAN 2 YEARS

The recently passed Benchmarking Ordinance will provide valuable transparency information to outline commercial and multifamily properties that have ample room for efficiency improvements. Energy efficiency is the most cost-effective tool to reduce GHG emissions and cut utility bills. Improvements to lighting, heating and cooling systems, appliances and the building enclosure can significantly reduce energy consumption.

The City should continue to expand the Sustainable Steps and GreenSpot programs for residential outreach, and further provide incentives to help offset the upfront costs for vulnerable populations. Municipal energy efficiency has been evaluated and should track implementation progress in line with the Comprehensive Energy Management Plan for City facilities.



IMPACT Energy Advocate, Ebony Williams, assists a Columbus resident in understanding energy efficiency and encouraging their participation in the energy audit program.

TARGETS
15% commercial energy use reduction by 2030
20% residential energy use reduction by 2030
25% municipal energy use reduction by 2030
50% residential, commercial and municipal energy use reduction by 2050

GHG IMPACT	
2030 Reduction	High - 1,755,945 MT
2050 Reduction	High - 1,656,781 MT

AGENCIES INVOLVED	
Lead Agency	Building and Zoning
Implementing Partners	Public Utilities, Sustainable Columbus, Economic Development, Rec & Parks

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
moderate
Human Health
moderate
Economic Prosperity
major

8.2 INCREASE WATER EFFICIENCY

HIGH EFFICIENCY FIXTURES CAN SAVE SIGNIFICANT AMOUNTS OF WATER AND LOWER WASTEWATER TREATMENT DEMANDS

Water fixtures utilize potable water resources, as well as energy to transport water to, from and within end uses. Replacing inefficient fixtures and appliances with EPA certified WaterSense fixtures can reduce water consumption by more than 20% compared to a typical baseline product. This will also reduce water utility bills, and reduce the demand on wastewater treatment plants.

Columbus is also in process of implementing the Enhanced Meter Project which will be replacing over 300,000 water meters for improved operational efficiency and usage accuracy. These will also help to identify early leak detection, reducing unnecessary water usage and customer costs.

In addition to the reduced energy expenditure and associated emissions from lower volumes of water, it will also help reduce water treatment facility stress during climate events.

TARGETS
5% residential and commercial water use reduction by 2030
10% municipal water use reduction by 2030
20% community-wide water use reduction by 2050

GHG IMPACT	
2030 Reduction	Low - 6,374 MT
2050 Reduction	Med - 28,243 MT

AGENCIES INVOLVED	
Lead Agency	Public Utilities
Implementing Partners	Public Health, Development

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
moderate
Human Health
moderate
Economic Prosperity
major

9

ADOPT NET ZERO AND RESILIENT BUILDING STANDARDS

Lower reliance on utilities and resilience preparedness go hand in hand

9.1 PROTOTYPE ZERO CARBON BUILDINGS

TECHNOLOGIES HAVE ADVANCED TO ENABLE BUILDING DESIGNS TO BALANCE CARBON DEMAND AND OFFSETS

A zero carbon building is built to the highest efficiency standards and is served by on-site renewable energy, with the capacity to generate as much energy as it consumes in one calendar year. Construction of buildings must utilize high efficiency standards and plan for the use of clean energy sources. There are multiple definitions and rating systems that outline pathways to net zero carbon that the City must will explore and define.

Once goals are defined, the City should identify upcoming design and renovation projects that would be suitable for pilot implementation.



The Wyandot Lodge facility was designed for Net Zero Energy, and should be used for operational lessons learned to achieve an energy balance of demand and on-site production from solar.

TARGETS
Adopt municipal zero carbon design standards by 2025
4 municipal zero carbon pilot buildings by 2030
Adopt zero carbon design standards by 2050

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	Finance & Management
Implementing Partners	Building and Zoning, Rec & Parks, Technology

EXPECTED BENEFITS
Climate Justice
some
Environmental Quality
major
Human Health
moderate
Economic Prosperity
moderate

9.2 ADOPT RESILIENT STANDARDS

SAFE BUILDINGS ARE NEEDED TO PREPARE FOR THE FUTURE CLIMATE

Preparing the building stock to survive and thrive in extreme heat and flood conditions will be necessary. Resilient design guidelines are intended to go beyond code requirements and plan for future conditions.

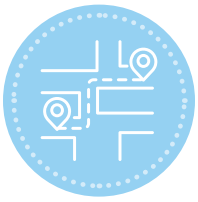
Utilizing flood event data and establishing locations where vulnerable populations reside without access to cooling in summer months should be used to first pilot the checklist. Continued follow up with pilot projects and updates to flood maps and climate predictions should be used to refine the checklist for an official roll-out by 2030.

TARGETS
Develop and pilot resilient design checklist by 2025

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	Building and Zoning
Implementing Partners	Planning, Technology, Public Utilities

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
moderate
Human Health
major
Economic Prosperity
moderate



TRANSPORTATION

Columbus is already setting examples for best practices in large cities that have traditionally been car-centric with the foundational work of Smart Columbus. The transportation sector has many emerging technologies currently under development, and future CAP updates will reflect advancements. Zero emission vehicles (ZEVs) include electric vehicles, hydrogen vehicles and allow for technology advances for any other solution that may provide an emission free tailpipe transportation option.

STRATEGIES

10. Enable carbon free vehicles
11. Support equitable mode shift



Image Source: MKSK

10

ENABLE ZERO EMISSION VEHICLES

Transitioning to clean transportation options is critical to achieve a carbon neutrality target

CATEGORIES OF VEHICLES

The United States is currently on the cusp of a motor vehicle transition. Major vehicle manufacturers are committing to electrifying their fleets for passenger vehicles, delivery vans, pickup trucks, buses and freight trucks. Battery sizes and vehicle charging infrastructure to ease range anxiety are critical technology pieces that are being developed as rapidly as the fleet options are expanding.

Vehicles are often referred to by their vehicle weight class - as light duty (sometimes also referred to as passenger vehicles), medium duty or heavy duty. These classifications are based on Federal Highway administration gross vehicle weight rating (GVWR) as noted below.



Image Source: Geotab

HEAVY DUTY	***MEDIUM DUTY***	***LIGHT DUTY***
>26,001 lbs	10,001 - 26,000 lbs	≤10,000 lbs
Freight trucks School buses City buses	Delivery vans Shuttles Farm/landscape truck	Light duty truck Passenger vehicle

10.1 INCREASE PRIVATE ZERO EMISSION VEHICLE ADOPTION

INCENTIVIZE AND REDUCE BARRIERS TO ENTRY FOR DRIVERS

Robust adoption of electric vehicles (EV) and other alternatives to internal combustion engine vehicles will be essential to meeting the GHG reduction targets of the CAP. While the cost of EVs are going down and more pre-owned EVs enter the market, there are still upfront cost barriers. Supporting the equitable installation of charging infrastructure goes hand in hand with EV adoption. Community members without access to a private garage or driveway must have a reliable mode of charging.

The City will need to continue supporting programs working with Smart Columbus to drive adoption, find strategies to reduce the cost barrier to entry and reduce range anxiety misconceptions. Implementation and progress for this goal is tracked by the total percentage of all vehicle registrations that are zero emission vehicles (ZEV). To reach the 2030 target, it is expected that the portion of new vehicle sales will need to reach 30% ZEVs to reach the overall registration percentage of 15% of all vehicles.

A data-informed equitable distribution of charging infrastructure at all new construction or major renovation projects, including affordable housing, will also be important to drive adoption. Through these targets, implementation of all Level 2 and DC Fast Charge (DCFC) permits should also be tracked on an annual basis to ensure an equitable distribution.

TARGETS
Equitable EV charging plan developed by 2025
EV Ready Ordinance implemented by 2025
15% ZEV registrations by 2030
100% ZEV registrations by 2050

GHG IMPACT	
2030 Reduction	High - 264,312 MT
2050 Reduction	High - 1,546,108 MT

AGENCIES INVOLVED	
Lead Agency	Smart Columbus
Implementing Partners	Public Service, Public Utilities, Building and Zoning, Clean Fuels Ohio

EXPECTED BENEFITS
Climate Justice
some
Environmental Quality
major
Human Health
moderate
Economic Prosperity
moderate

10.2 IMPLEMENT ZERO EMISSION VEHICLE FLEETS

INSTITUTIONAL POLICIES DRIVE DEMAND FOR ZEV FLEETS

A well-planned fleet electrification policy reduces vehicle maintenance labor and costs, and provides more consistent fuel cost projections, while significantly reducing carbon emissions. The City has already made significant improvements from the Green Fleet Action Plan and partnership with Smart Columbus, and must continue to lead. This action and targets are focused on typical passenger vehicles, excluding any with specialty use and essential services.

National commitments from Uber and Lyft to reduce the emissions of their contractor fleet vehicles and the Columbus Yellow Cab electrification transition will also contribute to the rideshare fleet vehicle implementation. Private companies that manage fleets must also be looking into transitioning fleets in the near-term.



Image Source: Smart Columbus

TARGETS
100% municipal light duty passenger ZEV by 2030
50% rideshare and private fleets ZEV by 2030
100% ZEV fleets by 2050

GHG IMPACT	
2030 Reduction	High - 220,428 MT
2050 Reduction	High - 578,214 MT

AGENCIES INVOLVED	
Lead Agency	Smart Columbus
Implementing Partners	Public Service, Finance, Technology, Public Utilities, Rec and Parks

EXPECTED BENEFITS
Climate Justice
some
Environmental Quality
major
Human Health
moderate
Economic Prosperity
major

10.3 PROMOTE MEDIUM/HEAVY DUTY ZERO EMISSION VEHICLE ADOPTION

DRIVE DOWN THE USE OF MORE CARBON INTENSIVE ENGINE FUELS

Availability of electrified and other zero emission fuel sourced vehicles for all public and private medium and heavy duty vehicles is expected to expand by the end of this decade to include an increased number of models and battery range with lower costs. Currently, the most common ZEVs in these categories are electrified passenger and school buses.

Transit and freight vehicles are under prototype development with private corporations making public commitments to switch to electric options. While the medium/heavy duty vehicles have a higher upfront cost, they typically hit cost parity quickly with lower fuel costs than diesel, and reduced maintenance. The community benefits of piloting electric vehicles in communities with historically higher air pollution levels should be prioritized whenever possible.

Intermediate technologies, such as compressed natural gas (CNG) buses, significantly reduce tailpipe emissions and are being widely implemented by COTA. These bridge technologies will provide incremental GHG reductions while technologies further advance for all vehicle types to have feasible, affordable ZEV options.

TARGETS
2% zero emission medium/heavy duty vehicles by 2030
100% zero emission medium/heavy duty vehicles by 2050

GHG IMPACT	
2030 Reduction	Med - 20,826 MT
2050 Reduction	High - 1,041,487 MT

AGENCIES INVOLVED	
Lead Agency	Smart Columbus
Implementing Partners	COTA, Public Utilities, Finance, Public Service, Rec and Parks

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
major
Human Health
moderate
Economic Prosperity
major

11

SUPPORT EQUITABLE MODE SHIFT

Access to reliable solutions other than a passenger vehicle will be necessary for human behavior shifts

11.1 IMPLEMENT COMPREHENSIVE MULTI-MODAL NETWORK

INVEST IN TRANSFORMATIVE HIGH CAPACITY TRANSIT CORRIDORS

LinkUS seeks to provide a complete mobility system along key regional growth corridors, including high capacity and advanced rapid transit, bicycle and pedestrian connections, safety improvements, and new housing and job opportunities. The initiative is a response to the challenges facing a growing region, including managing traffic congestion, ensuring equitable access to jobs and housing, promoting economic vitality, and improved sustainability.

The City of Columbus, COTA, Franklin County and MORPC represent the lead implementation agencies. Aligning the LinkUS priorities of equity, economic development, workforce advancement, affordability, innovation, and sustainability to other existing regional efforts such Central Ohio Greenways, the Regional Housing Strategy and the Franklin County Blueprint on Poverty is key to reaching our goals. Successfully implementing the LinkUS initiative will provide Columbus a strong infrastructure foundation from which to meet other equitable mode shift goals including reducing single occupancy commuting, increasing transit usage, and implementing last mile solutions.

TARGETS
Implement 3 regional High Capacity Rapid Transit lines by 2030
Implement 8 regional High Capacity Rapid Transit lines by 2050

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	Public Service
Implementing Partners	MORPC, COTA, Franklin County

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
moderate
Human Health
major
Economic Prosperity
some

11.2 REDUCE SINGLE OCCUPANT VEHICLE MILES TRAVELED

EMBRACE REMOTE WORK AND CARPOOLING OPPORTUNITIES

In response to the pandemic, Columbus was ranked as the top location for remote workers by Livability, and third best city by Acorns. The benefits range from affordable broadband service access to cost of living to availability of parks and green spaces. While most workers can not convert to full time remote working, flexible for applicable desk based positions where a hybrid mix of remote and in person work can significantly reduce the vehicle miles traveled (VMT) associated with commuting. Similarly, with the strong presence of higher education institutions throughout the City, virtual courses and coordinated class scheduling can reduce a commuters footprint by 20% for each day they work or learn from home.

The other significant factor to reducing VMT from single occupant driving is increasing the number of people in the vehicle. Incentives for HOV lanes and preferred carpool parking spaces can be positive reinforcement to support this transition. Companies and organizations can partner to provide guaranteed rides home for any unforeseen circumstances that may arise.

TARGETS
15% VMT reduction by 2030
40% VMT reduction by 2050

GHG IMPACT	
2030 Reduction	High - 439,011 MT
2050 Reduction	High - 1,421,539 MT

AGENCIES INVOLVED	
Lead Agency	Public Service
Implementing Partners	MORPC, Public Health, Planning, COTA, ODOT, Rec and Parks

EXPECTED BENEFITS	
Climate Justice	
	some
Environmental Quality	
	major
Human Health	
	moderate
Economic Prosperity	
	some

11.3 INCREASE TRANSIT USE

EFFICIENT MASS TRANSIT SYSTEMS WILL REDUCE TRAFFIC CONGESTION AND EMISSIONS

In 2019, COTA was one of few mass transit bus systems that saw growing ridership. This progress must continue, and further partnerships to promote ridership will usage need expanded. Working with large organizations and institutions to utilize bus services as a regular commuting option to work or school will also reduce highway congestion.

COTA should continue their ongoing work engaging with the existing rider base to refine service offerings that will reduce travel times, increase ridership and improve the perception of reliability.



Image Source: COTA

TARGETS
20% increase in passenger miles traveled by 2030
50% increase in passenger miles traveled by 2050

GHG IMPACT	
2030 Reduction	Low - 6,903 MT
2050 Reduction	Low - 18,873 MT

AGENCIES INVOLVED	
Lead Agency	COTA
Implementing Partners	Public Service, Franklin County, MORPC, ODOT, Technology

EXPECTED BENEFITS
Climate Justice
some
Environmental Quality
moderate
Human Health
moderate
Economic Prosperity
moderate

11.4 SUPPORT ACTIVE TRANSPORTATION INFRASTRUCTURE

THE LAST MILE CONNECTIVITY FROM MASS TRANSIT IS REQUIRED FOR COMMUNITY WIDE SUCCESS

Safe walking and bicycling infrastructure, and micromobility options - such as e-bikes and electric scooters - provide an important link to bridge the gap between bus service and commuter transit and the user's end destination with minimal or zero emissions. These solutions are also shown to increase overall walking and bicycling rates over time as a transportation method.

Equitable implementation of mobility hubs to increase access to these transportation options is important to address transportation injustice. Permanent docking stations and hubs, like the ones shown in the CoGo Station locator map below can be expanded into additional areas of the city, and paired with electric scooter or other future micro transit technology advances.

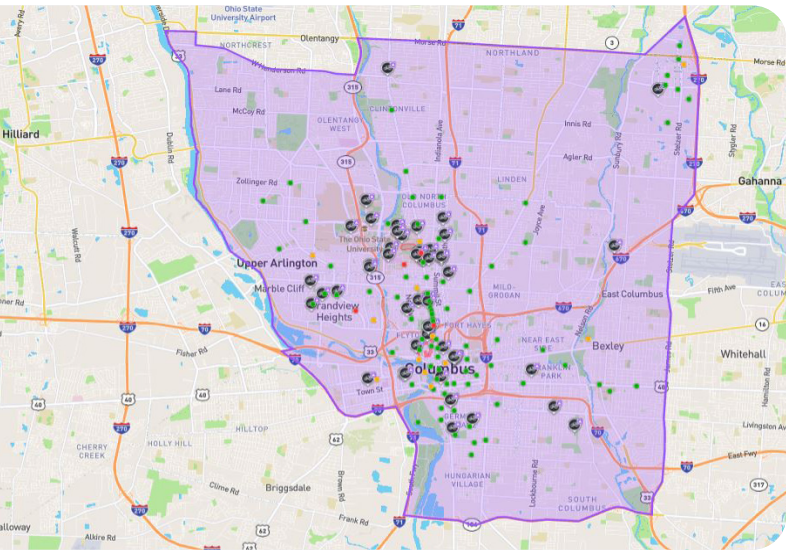


Image Source: CoGo Bike Share Station Map

TARGETS
20% increase in Walkscore and Bikescore by 2030
Mobility hubs within 1/2 mile from all residents by 2050

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	Public Service
Implementing Partners	COTA, Smart Columbus, Public Health, Rec and Parks, Neighborhoods

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
moderate
Human Health
major
Economic Prosperity
some



WASTE

GHG emissions from the waste sector are directly tied to methane emissions, which are 25 times as harmful as CO_2e. As the population of Columbus is projected to continue growing, landfill space becomes more constrained. It will be the most efficient use of public dollars to reduce the volume of waste and amount of physical space needed to contain it.

STRATEGIES

12. Reduce waste generated
13. Increase waste diversion rate

12

REDUCE WASTE GENERATED

Existing alternative solutions for downstream waste should be utilized to their maximum potential

12.1 REDUCE LANDFILLED ORGANIC WASTE

MANAGING A SIGNIFICANT PORTION OF FOOD AND YARD WASTE IN AN ALTERNATIVE WASTE STREAM SOLUTION

The 2019 waste characterization study from SWACO outlined food waste as the highest waste stream material at 15%, compostable fibers at 8% and yard waste at 3% for a total of 26%. Using this waste stream breakdown the CAP baseline inventory can show significant reductions from composting, reducing food waste and spoilage and utilizing yard waste mulching programs.

According to the Mid-Ohio Food Bank, 1 in 4 Columbus area children suffer from food insecurity. Access to fresh, healthy food should not be taken for granted. Programs from the food bank, SWACO and other community resources are available to help with cooking ideas and meal planning.



TARGETS
50% reduction in organic waste by 2030
90% reduction in organic waste by 2050

GHG IMPACT	
2030 Reduction	Med - 65,869 MT
2050 Reduction	Med - 133,784 MT

AGENCIES INVOLVED	
Lead Agency	Public Service
Implementing Partners	SWACO, Public Health, Sustainable Columbus

EXPECTED BENEFITS
Climate Justice
some
Environmental Quality
major
Human Health
moderate
Economic Prosperity
moderate

12.2 REDUCE RECYCLABLE WASTE SENT TO THE LANDFILL

ENSURE THE COMMUNITY UNDERSTANDS THE VALUE OF RECYCLING

A significant amount of landfill waste is readily able to be diverted in recycling streams without any infrastructure changes or new program implementation from metal, glass, paper and plastics. The regional recycling industry in Columbus supports six times more jobs than landfilling, and 80% of the recycled materials stay in the local area.

Programs to further spread education and awareness should be implemented throughout the city to increase participation and proper use of the different waste and recycling streams.

"Climate change is the most important issue facing humanity today. My family works toward being climate neutral, as we see the effects of climate change every day. And we want to mitigate those effects to the largest extent possible. While I am motivated by the future world my children will inherit, **I am also motivated by the world I am living in TODAY which is HOTTER, more VOLATILE and far more POLLUTED than I ever imagined possible in my youth**. Here in the U.S. we prize our freedom above all else. But what is the value of freedom in a world where we can't breathe, or go outside because of the effects of climate change"

Sarah Hazzard,
Clintonville Resident

TARGETS
40% reduction in recyclable waste landfilled by 2030
95% reduction in recyclable waste landfilled by 2050

GHG IMPACT	
2030 Reduction	Med - 105,979 MT
2050 Reduction	High - 278,687 MT

RESPONSIBILITY	
Lead Agency	Public Service
Implementing Partners	SWACO, Sustainable Columbus

EXPECTED BENEFITS
Climate Justice
some
Environmental Quality
major
Human Health
moderate
Economic Prosperity
some

13

INCREASE WASTE DIVERSION RATE

Targeting upstream waste so it can be utilized in a second life reduces overall waste generation

13.1 SUPPORT CIRCULAR ECONOMY ORGANIZATIONS

REPURPOSE MATERIALS FOR NEW LIFE

Studies have shown that a higher percentage of every dollar spent in locally owned businesses are reinvested throughout the community, as compared to national chain stores. Opportunities for entrepreneurs that will have a beneficial climate story should be supported and promoted to develop business strategies that creative jobs with living wages, while also reducing potential waste streams.

The Ohio Environmental Protection Agency has also established the online Materials in the Marketplace platform to promote reuse and recycling of by-product materials. The program diverted 3.7 million pounds of material from Ohio landfills in the first two years. Ohio State University's Sustainability Institute also has a Circular Economy research groups working to identify further recovery and reuse opportunities, and how to implement these processes.

SWACO has identified a value of $23 million from the discarded material that ends up in the landfill. This opportunity will be leveraged with the implementation team to help entrepreneurs, artists and all community members think differently about waste streams.

TARGETS
1,000 green job creation related to circular economy by 2030
100% increase in circular economy organizations from 2030 to 2050

GHG IMPACT	
2030 Reduction	Indirect
2050 Reduction	Indirect

AGENCIES INVOLVED	
Lead Agency	SWACO
Implementing Partners	Public Service, Sustainable Columbus, One Columbus

EXPECTED BENEFITS
Climate Justice
moderate
Environmental Quality
major
Human Health
some
Economic Prosperity
major



IMPLEMENTATION

RESPONSIBILITIES & PARTNERSHIPS

Effective implementation will be required to achieve the ambition set forth in the CAP. Sustainable Columbus will oversee the management of the CAP as a living document. They will support all lead agencies and implementing partners, help outline shifts where new technologies may be available or more affordable, regulations change, or additional partners are engaged.

Accountability will be key to success. Through the Sustainable Columbus Committee, Work Groups have been established for each sector of the CAP (Climate Solutions, Sustainable Neighborhoods, Buildings, Transportation and Waste). These groups will meet as needed and dictated by the work needed to report progress, share lessons learned and work through challenges together. This structure is also intentional to spur immediate action to outline necessary budgets and staff for each action. Annual reporting on key metrics for the targets of each action; and inputs for each annual GHG inventory will be due at the end of each calendar year. Community members and stakeholders who also contributed to the CAP will also be part of the Sector Working Groups to assist with community outreach and ensure initial priorities and ambitions are met.

In addition to the sector Work Groups, Sustainable Columbus will also provide oversight to ensure implementation is reaching and benefiting all community members. All agencies and team members working on implementation must continue to build inclusive and authentic relationships with diverse community member representation, understand their critical needs and involve them in the decisions being made.

LEAD AGENCY

- Oversee all action progress and metric tracking for targets
- Coordinate and delegate resources for target implementation plans
- Track necessary budgets for targets to be achieved
- Coordinate with and report to Sustainable Columbus
- Schedule Work Group meetings

IMPLEMENTATION PARTNER

- Provide human and/or physical resources to the action
- Proactively plan and adjust budgets as needed to achieve targets
- Participate in Work Group meetings
- Provide feedback and recommendations for CAP updates and revisions

IMMEDIATE ACTIONS:

The following actions have the fastest timeline, with a target implementation goal of 2025:

- **2.2 Establish a green bank**
- **3.1 Prioritized strategies outlined**
- **3.3 Outline 7% increase to GHG modeling reduction**
- **4.1 Develop an implementation plan for priority resilience hub locations**
- **4.2 Implement a regional alert system for climate hazards**
- **5.1 Establish vacant property redevelopment targets**
- **5.4 Implement short-term Sustaining Scioto strategies**
- **6.1 Complete physical vulnerability assessment**
- **6.3 Complete a microgrid and energy storage prioritization study**
- **7.1 Establish a Community Solar Plan**
- **9.1 Adopt municipal zero carbon design standards**
- **9.2 Develop and pilot resilient design check list**
- **10.1 Equitable EV charging plan developed and EV Ready Ordinance implemented**

WHAT CAN YOU DO?

Columbus can't achieve this carbon neutrality goal alone. Cities, states, and federal partners all have roles to play in the short-term and long-term to keep us on track with the Paris Agreement, and limiting our emissions globally to 1.5° C.

Enthusiastic Residents
Passionate advocates will be needed throughout the city to continue these conversations, engage their neighbors and coworkers, and share why it is important for the future we envision.

Private Sector and Organization Partners
Environmental, social and governance (ESG) criteria is becoming more prominent in the private and non-profit sectors to push the climate agenda. These can help promote actions of the CAP and drive adoption that will bring down technology costs for all.

State of Ohio
A renewable-based electricity grid, building codes pushing harder on resource efficiency and mass transit expansion opportunities managed at the state level must be implemented on an accelerated schedule.

National Leadership
The federal government has recommitted the United States to the Paris Agreement, and passing infrastructure bills to provide funding sources is imminent. Proactive planning to utilize this opportunity should begin immediately.

MONITORING AND REPORTING

FUTURE UPDATES

The timeline on the following page outlines the future schedule for reporting. These yearly data collection efforts will provide transparency for monitoring progress, and collectively provide the information needed to adjust and retool any actions that are ahead or behind targets.

Sustainable Columbus will implement a system and dashboard to demonstrate progress to the community for each action in relation to the targets outlined in the CAP. This will form the basis for continual, transparent progress updates to the community.

CAP updates are intended to be fast, reactive adjustments to the trends from tracking metrics in previous years. Full CAP revisions will include a thorough review of all actions and targets, and realign as needed with any regulatory shifts, technology improvements or cost changes.

As a plan for the community, proactive engagement should continue throughout the implementation and reporting phases. Outreach efforts to share progress reports will be needed to gain the groundswell of support from residents, businesses, organizations and other champions to reach the CAP goals.

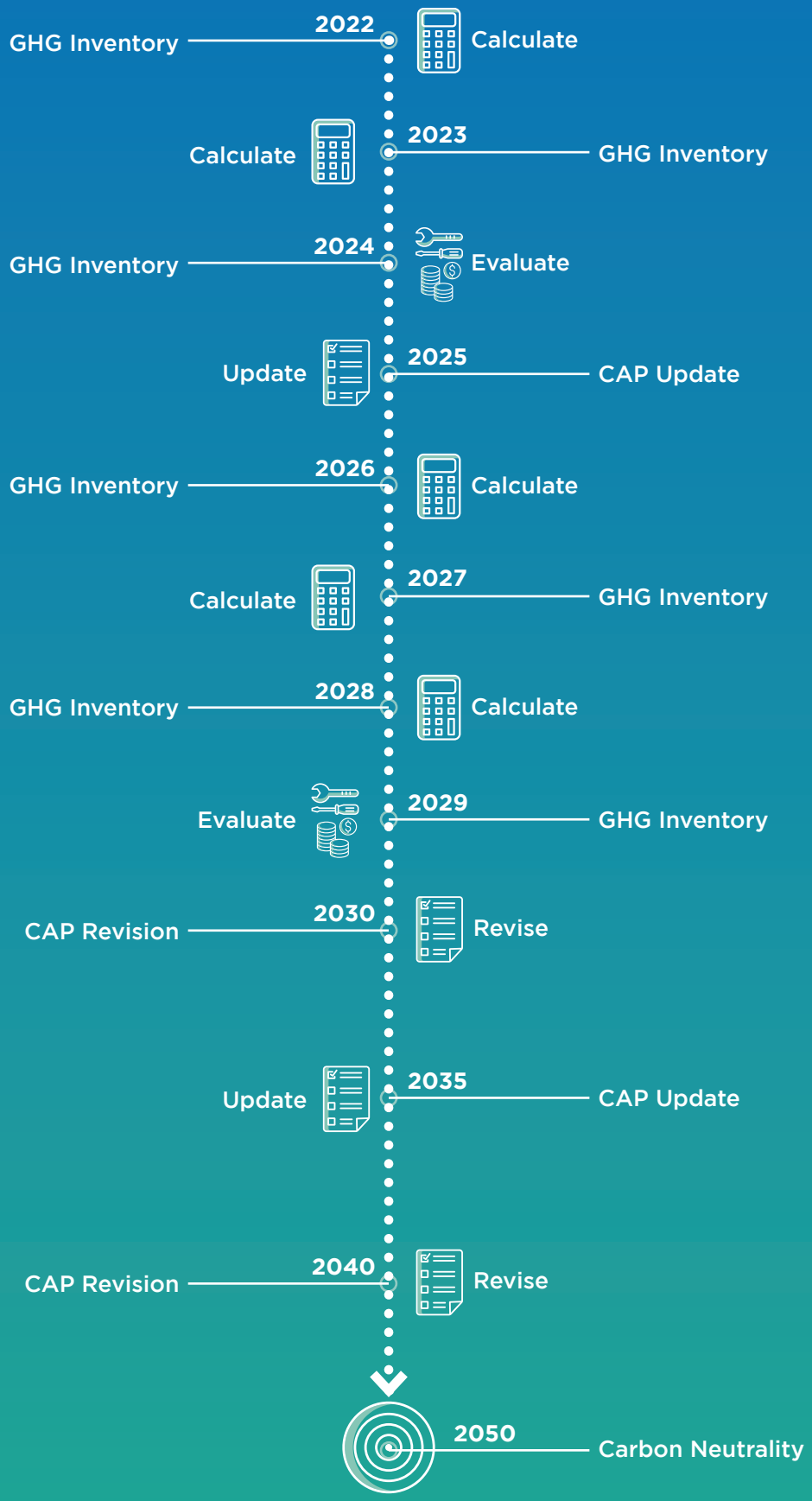
CARBON OFFSETS

Future GHG Inventories are anticipated to continue being collected annually. Since the ICLEI US Community protocol does not outline a procedure for reporting benefits associated with carbon offset projects, the GPC Standard for Cities should be followed. This states that offset credits should be separately tracked from the GHG Inventory, and outline where they are generated and sold within and outside the local geographic boundary - in this case, the Columbus municipal limits.

PROGRESS REPORTING

The annual progress for cumulative actions will be reported by the Sustainable Columbus team. This has been set up to clearly outline the GHG inventory of Columbus' emissions, and net the reductions from carbon offsets and clean energy procurement to show progress towards the overall carbon neutrality goal.

CLIMATE ACTION PLAN TIMELINE





Contact Us:

ClimateActionPlan@columbus.gov

Learn More:

www.columbus.gov/sustainable/cap

SUSTAINABLE COLUMBUS

ANDREW J. GINTHER, MAYOR

ARUP

MKSK