Prepare Louisville

Prepared by the Geos Institute

Background

With a rich history as one of the oldest cities west of the Appalachians, Louisville merged with Jefferson County to form Louisville Metro in 2003. Louisville Metro ("Louisville") now covers an area of 397 square miles, of which 380 square miles is land and 17 square miles is water. Louisville is located on the Ohio River along the border between Kentucky and Indiana. Louisville bustles with local businesses, a diverse population, and thriving tourism industry centered around historical sites, including the birthplace of Muhammad Ali, the Kentucky Derby and a rich food, bourbon, art and museum scene.

Louisville's neighborhoods each have a history and character of their own. Some of the oldest border the Ohio River, demonstrating the historic importance of river transport. As Louisville grew, neighborhoods such as Butchertown, Phoenix Hill and Russell developed further from the river. After the Civil War, freed slaves settled in

Smoketown, Park DuValle, Griffytown, and others. Early suburbs, such as Old Louisville, Beechmont, and the Highlands, developed as transportation became available. As the suburbs expanded in the 1960's and 1970's, many urban neighborhoods began to decline, spurred on by the discriminatory and systemic practices of redlining and urban renewal. Historical legacies of slavery and redlining have led to significant racial and wealth disparities among the neighborhoods of Louisville. Building equitable neighborhoods is a key objective in building climate resilience.

Louisville is home to more than 770,000 people (about half the population of Nebraska), The percentage of white residents is declining, while people of color, immigrants, and refugees continue to increase, contributing to the diversity of the region. Seven percent of all residents are foreign-born, and as many as 130 languages are spoken throughout the community. People with a disability comprise 14.5% of the population.

In 2011, Louisville committed to a compassionate city campaign. This campaign was promoted to champion and nurture the growth of compassion across the community. Compassion comes through finding common ground and increasing both empathy and understanding among all people. Compassion is a unifying force, born out of a shared purpose and principle that fosters volunteering, mentoring, beautification, and restoration.

This commitment to compassion was an underlying driver for the community's climate resilience work because they understood that climate impacts are not evenly distributed. Community members who lack adequate housing, financial resources, strong social networks or with health and mobility challenges are more at risk to the impacts of a changing climate such as heat waves and worsening air quality.

Louisville's economy is built on a wide diversity of large and small industries and businesses. The area serves as a shipping, trucking, and global air freight hub and major center for manufacturing, logistics, and lifelong wellness and aging care. The distilling industry is an integral growth area for Louisville, bringing tourism to the region and contributing to a bustling downtown restaurant and arts scene.

Louisville has a wide variety of natural vegetation, including forests and woodlands, parks, tree-lined streets, and landscaped gardens, yards, and grounds. And yet, Louisville's Urban Tree Canopy Assessment showed that trees cover 37 percent (just over 94,000 acres) of Louisville's Metro area. Since 2002, seven percent of Louisville's tree canopy has been lost, with an average loss of 820 acres or 54,000 trees per year.

Starting in 1986, Louisville's waterfront has been redeveloped from a blighted and underutilized area into a vibrant, active area. The result is Waterfront Park, which has improved the quality of life of Louisville residents and has also been a catalyst for business and residential redevelopment.

Louisville has a long history of climate leadership. In 2005 the Mayor signed the U.S. Mayors Climate Protection Agreement. In November 2008 Louisville Metro Air Pollution Control District released the city's first Greenhouse Gas Inventory and in 2018 issued an updated and expanded inventory. In 2013 the Office of Sustainability released the Louisville Metro Sustainability Plan. In 2018 Louisville Metro announced a goal of 80% reduction of greenhouse gas emissions by 2050. In 2019, the Mayor declared a climate emergency, followed by a resolution to transition to 100% renewable energy by 2040. Louisville was also selected to join the global 100 Resilient Cities Network in 2016, with a subsequent Resilient Louisville report published in 2019.

Get Started

The community had already been experiencing extreme weather events with hurricanes and freezing rain causing power outages for hundreds of thousands of residents for days, in addition to increasing precipitation and temperatures. One particular concern was the area's stormwater infrastructure, which was not designed to handle the more extreme storms that have been occurring in recent years and are expected to increase in size and magnitude due to climate change. Most of Louisville's stormwater system combines with sewer or wastewater. As a result, during heavy storms a mixture of wastewater and sewage backs up into homes and onto streets creating a public health hazard due to harmful bacteria. Contaminated waters can also end up in Louisville's creeks, rivers, and wetlands. For example, during an exceptionally wet period of time (February 19, 2018 to March 2, 2018), four billion gallons of stormwater and raw sewage went straight into the Ohio River and Beargrass Creek and other waterways in Louisville.

In mid-2018 Louisville Metro Government (LMG) issued a request for proposals (RFP) for a Hazards Identification, Vulnerability Assessment, and Climate Adaptation Plan that would meet the Global Covenant of Mayors Climate and Energy requirements. The Louisville Metro Government selected a consultant team of climate adaptation planning (Geos Institute) and community engagement experts (Climate Access). The work began in January 2019.

From the start LMG was committed to a broad and inclusive public engagement strategy to be integrated throughout the planning process. The goal was to meet people where they are and be strategic about reaching new audiences. Many residents had already been part of a large engagement process through the 100 Resilient Cities effort.

The final plan, *Prepare Louisville*, was the result of extensive participation by the community, with people representing many different sectors, including health care, neighborhood associations, transportation, business, government, emergency preparedness and response, non-profit organizations, environmental groups, industry, and others. A similarly diverse steering committee was tasked with ensuring that all strategies were designed to advance equity and protect those most at-risk from climate impacts.

The planning process was guided by a 16-person Strategy Team representing departments within Louisville Metro Government, local utilities, local and regional nonprofit organizations, public schools, and academic institutions. The Strategy Team provided guidance, expertise, and ensured that the process and resulting action plan was equitable. An early task of the Strategy Team was to identify the community values important in the climate resilience planning process. The values identified included the following.

- Green jobs and living wages
- Neighborhood networks and support
- Cross-cultural and interracial understanding
- Investment in underserved areas
- Opportunities to be active and healthy
- More efficient and healthier homes
- Preparedness for extreme events
- Cleaner air, waterways and parks
- Improved ecosystem health
- Greater biological diversity
- Environmental and social awareness

Understand Exposure

The consultant team developed a Climate Trends Primer, detailing the past and future climate trends for the area. They utilized downscaled climate data from ClimateNA to compare temperature and precipitation in the current period (1989-2019) with historical (1961-1990) trends. They found Louisville's current average temperature is 2°F warmer and the minimum temperature is 6°F warmer than the historical period. Precipitation has increased by 9% with the three wettest days occurring in the last decade, and there is 25% less snowfall. The Louisville Airport weather station recorded a doubling of days above 90°F in the 2010s compared to the 1960s.

Using this same approach, the consultant team also looked at future climate trends which showed continued rising average temperatures, greater frequency of days above 100°F, increased ground-level ozone and drought stress, and more frequent large-scale flood events.

The Climate Trends Primer also looked at changes in the dominant vegetation of the area due to drought stress and increased pests and diseases. At particular risk are sugar maples, black walnut, and white oak. As the area warms, species from the south and west are expected to move into the area. The area is also expected to experience higher wildfire risk and longer wildfire season as climate change progresses.

To help communicate these findings, the planning team developed a short two-page handout that summarized the information from the Climate Trends Primer.

Resource 2.6: Sample Exposure Matrix for Louisville, Kentucky

	Hazards			
Community Assets	**Extreme heat**	**Flooding**	**Severe Storms**	**Decreasing Air Quality**
Human health	x	x	x	x
Residential buildings		x	x	
Economy and local businesses	x	x	x	x
Natural areas	x	x	x	

Assess Vulnerability and Risk

The planning team utilized the Whole Community Resilience framework for this project. This framework is similar to the Steps to Resilience but divides the process into seven steps. Learn about Comparable Risk Frameworks to the Steps to Resilience.

The Whole Community Resilience framework is focused on the five primary community systems and combines technical and scientific expertise with the lived experience of local residents. The five systems included

- the built environment (buildings, roads, energy),
- social (health, social services, emergency response),
- cultural (youth, immigrant communities, Kentucky Derby),
- economic (industry, business, and tourism), and
- the natural environment (urban trees and parks, fish and wildlife).

To understand Louisville's climate vulnerability, the planning team in collaboration with Louisville Metro Government staff and the project Strategy Team hosted a day-long workshop. Participants were key stakeholders and leaders in the community, specifically invited because of their expertise with one or more community systems. The Strategy Team was an integral part of developing the invitation list and ensuring representation of diverse voices. (Potentially highlight this last sentence as a good opportunity for the practitioner, local government champion, and any community champions to work collaboratively)

The workshop was highly participatory, with most of the day spent in breakout groups where attendees identified and prioritized the risks to the community due to climate change. Each breakout group was focused on one community system. For each identified impact, the following information was collected:

1. **Exposure** – The specific climate trend or projection that is already causing or is expected to cause the impact
2. **Timeframe** – (Near, Mid, Long) When the impact is expected to occur in Louisville
3. **Certainty** – (High, Medium, or Low) How certain we are that the impact will occur, given our current knowledge of climate change projections and our understanding of the impact itself

4. **Sensitivity** – (High, Medium, or Low) Given our understanding of the specific sector for each given impact, how much of a response or how great of an impact is expected (e.g. how disruptive it is, how serious the consequences are, and how much overall change is expected)
5. **Adaptive Capacity** – (High, Medium, or Low) Whether there are already existing resources, programs, or policies in place to protect people or to respond to the changes with little disruption
6. **Focal Populations** – The specific neighborhood, population, area, or category of resources or people that are expected to be especially affected by the impact, as well as any that are expected to be buffered due to special circumstances
7. **Other Stressors** – Additional and ongoing stressors to the population or resource to be affected
8. **Secondary Vulnerabilities** – Other potential responses to or effects related to climate change that are likely to affect the impact under consideration

Each breakout group was provided a copy of the climate projections and trends report from the consultant team, as well as a set of maps showing the locations in the community affected by and/or vulnerable to extreme heat, flooding, hazardous materials, sinkholes, landslides, and wildfire. Additional maps provided information about the racial diversity across the area and land use designations. At the end of the day, a dot voting exercise helped prioritize these vulnerabilities according to community values.

The list of vulnerabilities was further refined by the consultant team based on information in existing reports, such as the 2016 Louisville Metro Hazard Mitigation Plan, and through conversation with Louisville Metro Government and the project Strategy Team. The consultant team developed a final report, Climate Change Vulnerability in Louisville, Kentucky, with all this information. The final list of vulnerabilities is below:

Health and Emergency Services

High vulnerability:	▪ Exposure to hazardous materials ▪ Electrical outages
Medium-high vulnerability:	▪ Increase in heat waves and heat-related illnesses and mortality ▪ Air quality declines ▪ Spread of pests and disease ▪ Overburdening of health care industry ▪ Overburdening of emergency response

Infrastructure

High vulnerability:	▪ Collapse and damage to aging infrastructure, especially sewer systems ▪ Damage to homes and businesses from floods, wind, and other extreme events ▪ Increasing cost of energy ▪ Potential energy outages with higher demand
Medium-high vulnerability:	▪ Less availability of affordable housing ▪ Increasing transportation disruptions and congestion

Business and the Economy

High vulnerability:	▪ Increasing cost of energy affecting businesses
Medium-high vulnerability:	▪ Increasing transportation disruptions and congestion
Medium vulnerability:	▪ Business costs associated with distribution, insurance, energy, and disaster losses

Natural Systems

High vulnerability:	▪ Spread of pests and disease affecting fish, wildlife, trees, gardens, and agriculture ▪ Loss of green spaces, especially affecting lower income neighborhoods ▪ Loss of native ecosystems and species, also affecting outdoor recreational opportunities
Medium-high vulnerability:	▪ Degradation of aquatic systems, leading to loss of important services such as flood abatement and filtration ▪ Tree canopy loss from disease and extreme events, exacerbating heat impacts ▪ Degradation and loss of nature leading to less interest in conservation

Neighborhood Values and Culture

High vulnerability:	▪ Exacerbated tensions and inequities ▪ Increasing cost of energy affecting lower income residents
Medium-high vulnerability:	▪ Increasing violence and crime with heat ▪ Less availability of affordable housing ▪ Increasing transportation disruptions and congestion ▪ Impacts to food availability and cost ▪ Quality of life declines
Medium vulnerability:	▪ Lack of sustainability lifestyles and options ▪ Need for strong local climate leadership

While this project did not have access to the templates and resources of the Steps to Resilience training, some sample impact statements are provided below for reference. The information was all derived from data in this project.

Sample Impact Statement 1

Describe the physical community asset and hazard, and discuss exposure.

1. **Community asset, sector, or service:** Human health
2. **What is the hazard causing the impact? Is the impact near-term, long-term?** Power outages due to high wind and flooding from increasing severe thunderstorms.
3. **Scale (a particular transportation corridor, neighborhood, entire project or study area):** Entire Metro area, especially those living in high flood risk areas, including South and West Louisville, and areas near Prospect/Ohio River adjacent, Beargrass Creek, and Mill Creek neighborhoods. Persons with limited mobility such as elders, homeless, and people without vehicles.
4. **Primary function (what is disrupted by impacts, why do these functions matter):** The ability to keep food and medications refrigerated and the ability to safely navigate the area to find food and medical care. Both functions are essential to human health and safety.
5. **Exposure (defined as the presence of people and community assets in places where they could be adversely affected by hazards):** Residents experience varying lengths of time for power to be restored after loss of transmission lines and electric transformers. Flooding and high wind exacerbate restoration activities, extending the amount of time residents must deal with no power. Longer durations without power present more risks, especially for those who need to keep medications refrigerated or need to power medical equipment. Fallen transmission lines can also present an extreme danger if they remain live.

Consider what factors or characteristics make the people and community assets more or less vulnerable to impacts. This may be determined by examining the assessment factors, such as building year, or the social vulnerability indicators, or a combination of those. Remember there are physical and social drivers of vulnerability. Identifying these aspects within the impact statements will help inform the development of options in the Investigate Options step.

Describe the types and causes of vulnerability.

1. **What are the key ways in which the community asset(s) is/are vulnerable to impacts?** What makes the community asset sensitive to the hazard, have low adaptive capacity? During energy outages, some of the most vulnerable

populations include medically-sensitive populations and elders, because the loss of power can lead to exposure to extreme heat or cold, as well as failure of vital medical equipment. Flooded roadways prevent people from accessing medical help or seeking safety. Flooding can also expose people to harmful and hazardous materials, both during and after the flood waters recede. Adaptive capacity is generally low for medically-sensitive populations and those with limited mobility.

2. **Sensitivity:** Generally high for all exposed, especially those with medical concerns and limited mobility.

3. **Describe the pre-existing stressors, social vulnerabilities, or and any root causes (historical disinvestment, income inequality, limited access to resources or services):** Many industrial sites were built along the river due to the proximity of barge transportation and water for industrial processes. The presence of hazardous materials can be greater in these locations. Also, a history of racial discrimination and redlining in the area led to disinvestment in several areas.

Use the information gathered and construct a full impact statement. This can be 1-4 sentences. This should be a story about the particular neighborhood, area, community asset identified above. Why does it matter if this area is affected or function is lost?

1. The health and safety of medically-sensitive and transportation-limited residents is at risk from power outages and exposure to hazardous materials due to flooding and high winds associated with increasing severe thunderstorms.

Sample Impact Statement 2

Describe the physical community asset and hazard, and discuss exposure.

1. **Community asset, sector, or service:** Air cargo shipping
2. **What is the hazard causing the impact? Is the impact near-term, long-term?** Less dense air due to extreme heat
3. **Scale (a particular transportation corridor, neighborhood, entire project or study area):** Louisville International Airport
4. **Primary function (what is disrupted by impacts, why do these functions matter):** Louisville International Airport is the global air cargo hub for UPS and is the third busiest air cargo hub in the U.S, supporting over 60,000 direct and indirect jobs.
5. **Exposure (defined as the presence of people and community assets in places where they could be adversely affected by hazards):** More frequent and severe heat waves can increase costs of shipping and disrupt air travel, sometimes grounding all planes until temperatures cool again.

Consider what factors or characteristics make the people and community assets more or less vulnerable to impacts. This may be determined by examining the assessment factors, such as building year, or the social vulnerability indicators, or a combination of those. Remember there are physical and social drivers of vulnerability. Identifying these aspects within the impact statements will help inform the development of options in the Investigate Options step.

Describe the types and causes of vulnerability.

1. **What are the key ways in which the community asset(s) is/are vulnerable to impacts? What makes the community asset sensitive to the hazard, have low adaptive capacity?**
   Because warm air is less dense, planes have a harder time taking off in triple-degree heat, leading to less cargo and weight capacity per flight. Longer runways and different aircraft could be needed to adapt to warmer temperatures.
2. **Sensitivity:** High, especially if the amount of shipping is reduced and jobs are eliminated
3. **Describe the pre-existing stressors, social vulnerabilities, or and any root causes (historical disinvestment, income inequality, limited access to**

resources or services). Because of its location in the middle of the U.S., Louisville is an ideal location for cargo shipping. Increases in e-commerce have increased the need for workers.

Use the information gathered and construct a full impact statement. This can be 1-4 sentences. This should be a story about the particular neighborhood, area, community asset identified above. Why does it matter if this area is affected or function is lost?

1. The Louisville International Airport is a leading global air cargo hub and the global air cargo shipping headquarters for UPS. Extreme temperatures associated with climate change can lead to lower weight limits on air cargo. Because warm air is less dense, planes have a harder time taking off in triple-degree heat, leading to less cargo and weight capacity per flight. More frequent and severe heat waves can increase costs of shipping and disrupt air travel, sometimes grounding all planes until temperatures cool again.

Investigate Options

With the vulnerability assessment completed, the planning team turned to identifying options to reduce risk and build resilience. To do this, the planning team in collaboration with Louisville Metro Government staff and the project Strategy Team hosted another day-long workshop. To ensure continuity, most participants also attended the previous workshop focused on identifying vulnerabilities. Additional participants were invited to help fill in gaps and ensure diverse representation across all five community systems.

The consultant team provided a brief overview of the climate trends and the vulnerabilities identified in the previous workshop. The Climate Trends Primer and the *Climate Change Vulnerability in Louisville, Kentucky* reports were sent to all participants ahead of the workshop so everyone was working from the same base level of understanding.

Just as before, the workshop was designed to be highly participatory, with most of the day spent in breakout groups where attendees identified strategies and associated actions to address the community's climate vulnerabilities. In this workshop, cross-sector collaboration was prioritized so each breakout group consisted of stakeholders of all five community systems. The breakout groups were organized based on the community impacts, and each group was assigned 4-6 vulnerabilities from across all sectors. The breakout groups topics were:

1. Flood and pollution prevention
2. Cost and affordability
3. Extreme heat and health
4. Business and transportation
5. Water quality and natural resources
6. Sustainability
7. Emergency preparedness and response

During the breakout groups, participants identified objectives and actions for each assigned vulnerability. (A note on terminology: it was important for this community to use the term "objective" instead of "strategy" to stay in alignment with previous reports and the practices of local government. As such, we use "objective" in this case study in the same way you may use the term "strategy" in another community.)

In addition to using their own expertise and knowledge of what could help reduce risk or increase adaptive capacity, participants could reference a list of potential options provided by the consultant team. This list included actions already identified in existing documents and plans across the community and helped participants understand what was already underway, what could be strengthened in the resilience plan, and what gaps remained. These reports included the 2009 Partnership for a Green City Climate Action Report, the 2019 Resilient Louisville report, the 2017 Health Equity Report, the 2016 Urban Heat Management Study, the 2019 Opportunity Zone Prospectus, and the 2016 Water Quality Synthesis report. (This project occurred before the Options Database was developed and made available on the Climate Resilience Toolkit.)

For each identified action, the following information was collected:

1. **Objective:** the overarching strategy the action will help achieve
2. **Action:** the specific action step designed to further the stated objective
3. **Co-benefits:** potential positive impacts of the action to groups, resources, or populations other than those that are the focus of the action, including achieving multiple goals at once, creating new relationships between stakeholders/departments, and cost sharing opportunities
4. **Tradeoffs:** any potential negative impacts of the action related to groups, resources, or populations other than those that are the focus of the action

with special consideration given to how the action could make climate change worse or prevent resilience in other sectors.

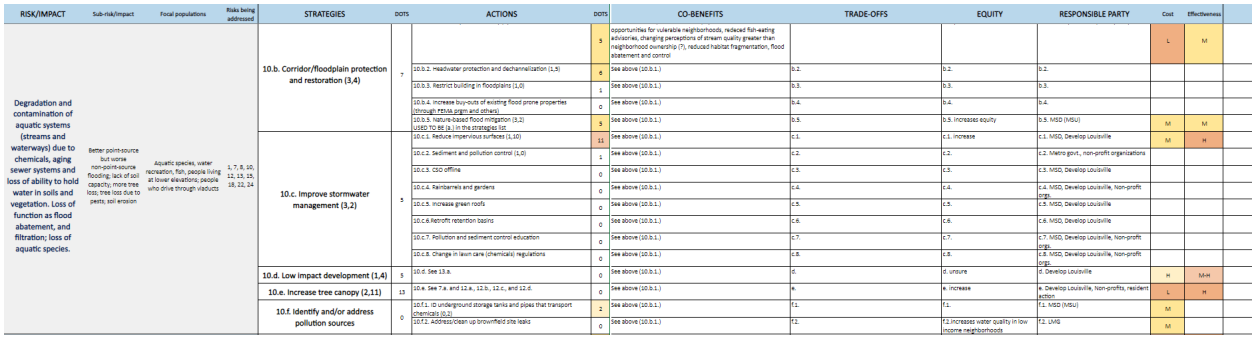
5. **Equity:** note how the proposed action affects jobs, housing, clean water, etc. for vulnerable populations and/or increase peoples' ability to afford basic living needs. Also consider if the action respects cultural relevance and history or empowers marginalized groups in leadership and decision-making.

6. **Responsible Party:** list who is potentially responsible for implementing the action. Cost: rank the relative costs of the action as High, Medium, or Low based on best available information, and note if the action will result in cost savings over time.

7. **Effectiveness:** rank as High, Medium, or Low based on the level of certainty that the action will reduce vulnerability and lead to greater climate resilience. Consider whether the strategy/action has been tested, whether the outcome is well-understood, and whether there is a risk of negative outcomes.

8. **Comments:** any additional comments or explanation

All the workshop input was collected and entered into a spreadsheet. The planning team then worked with the Strategy Team and Louisville Metro Government staff to further develop the details and refine the list. This included an opportunity for additional input to specific actions' details and one-on-one conversations with community experts to understand potential co-benefits and tradeoffs.



RISK/IMPACT	Sub-risk/impact	Focal populations	Risks being addressed	STRATEGIES	DOTS	ACTIONS	DOTS	CO-BENEFITS	TRADE-OFFS	EQUITY	RESPONSIBLE PARTY	Cost	Effectiveness
Degradation and contamination of aquatic systems (streams and waterways) due to chemicals, aging sewer systems and loss of ability to hold water in soils and vegetation. Loss of function as flood abatement, and filtration; loss of aquatic species.	Better point-source but worse non-point-source flooding; lack of soil capacity; more tree loss; tree loss due to pests; soil erosion	Aquatic species, water recreation, fish, people living at lower elevations; people who drive through viaducts	1, 7, 8, 10, 12, 13, 15, 18, 22, 24				3	opportunities for vulnerable neighborhoods, reduced fish-eating advisories, changing perceptions of stream quality greater than neighborhood ownership (7), reduced habitat fragmentation, flood abatement and control				L	M
				10.b. Corridor/floodplain protection and restoration (3,4)	7	10.b.2. Headwater protection and dechannelization (1,3)	6	See above (10.b.1.)	b.2.	b.2.	b.2.		
						10.b.3. Restrict building in floodplains (1,0)	1	See above (10.b.1.)	b.3.	b.3.	b.3.		
						10.b.4. Increase buy-outs of existing flood prone properties (through FEMA prgm and others)	0	See above (10.b.1.)	b.4.	b.4.	b.4.		
						10.b.5. Nature-based flood mitigation (3,2) USED TO BE (g.) in the strategies list	3	See above (10.b.1.)	b.5.	b.5. increases equity	b.5. MSD (MSU)	M	M
				10.c. Improve stormwater management (3,2)	5	10.c.1. Reduce impervious surfaces (1,10)	11	See above (10.b.1.)	c.1.	c.1. increase	c.1. MSD, Develop Louisville	M	H
						10.c.2. Sediment and pollution control (1,0)	1	See above (10.b.1.)	c.2.	c.2.	c.2. Metro govt., non-profit organizations		
						10.c.3. CSO offline	0	See above (10.b.1.)	c.3.	c.3.	c.3. MSD, Develop Louisville		
						10.c.4. Rainbarrels and gardens	0	See above (10.b.1.)	c.4.	c.4.	c.4. MSD, Develop Louisville, Non-profit orgs.		
						10.c.5. Increase green roofs	0	See above (10.b.1.)	c.5.	c.5.	c.5. MSD, Develop Louisville		
						10.c.6.Retrofit retention basins	0	See above (10.b.1.)	c.6.	c.6.	c.6. MSD, Develop Louisville		
						10.c.7. Pollution and sediment control education	0	See above (10.b.1.)	c.7.	c.7.	c.7. MSD, Develop Louisville, Non-profit orgs.		
						10.c.8. Change in lawn care (chemicals) regulations	0	See above (10.b.1.)	c.8.	c.8.	c.8. MSD, Develop Louisville, Non-profit orgs.		
				10.d. Low impact development (1,4)	5	10.d. See 13.a.	0	See above (10.b.1.)	d.	d. unsure	d. Develop Louisville	H	M-H
				10.e. Increase tree canopy (2,11)	13	10.e. See 7.a. and 12.a., 12.b., 12.c., and 12.d.	0	See above (10.b.1.)	e.	e. increase	e. Develop Louisville, Non-profits, resident action	L	H
				10.f. Identify and/or address pollution sources	0	10.f.1. ID underground storage tanks and pipes that transport chemicals (0,2)	2	See above (10.b.1.)	f.1.	f.1.	f.1. MSD (MSU)	M	
						10.f.2. Address/clean up brownfield site leaks	0	See above (10.b.1.)	f.2.	f.2 increases water quality in low income neighborhoods	f.2. LMG	M	

The final list of 24 objectives and 166 actions were then organized into seven primary goals that aligned with the identified community values:

1. Equitable Neighborhoods
2. Healthy Residents
3. Natural Capital

4. Sustainable Businesses
5. Resilient Infrastructure
6. Community Readiness
7. Louisville Leadership

Adaptation Objectives and Actions

Key to Acronyms for Lead/Partner agency or organization

APCD – Air Pollution Control District
DAQ – Division for Air Quality (state)
DOT – Department of Transportation
EMA – Emergency Management Agency
EMS – Emergency Management Services
EPA – Environmental Protection Agency
FEMA – Federal Emergency Management Agency
GLI – Greater Louisville Inc. (Metro Chamber of Commerce)
JCPS – Jefferson County Public Schools
KDEP – Kentucky Department of Environmental Quality
KYEM – Kentucky Emergency Management
LG&E – Louisville Gas and Electric
LMG – Louisville Metro Government
LMPHW – Louisville Metro Public Health and Wellness
MSD – Metropolitan Sewer District
NGOs – Non-governmental organizations
PSC – Public Service Commission
TARC – Transit Authority of River City

Phase 1 Actions – Implementation to begin within 2 years = √
Risk – Risks are listed by number at the end of this table
Mitigation? – Reduces greenhouse gas emissions
Time frame – Near-term = within 5 years; Mid-term = 5-10 years or more

Equitable Neighborhoods

Objectives/Actions	Risks Addressed	Climate Hazard	Mitigation?	Lead/Partner Agency or Organization	Time Frame	Priority
OBJECTIVE 1: Create Cooler Neighborhoods						
Priority Actions						
√ Target tree canopy efforts (see Natural Capital section) in high-heat neighborhoods	3, 7, 8, 12, 14, 15, 19, 21, 22	Extreme heat	✔	LMG, NGOs, Universities	Near	High
√ Organize and coordinate community communication systems for efficient response	7, 8, 15, 20, 21	Extreme heat		Health Dept., EMA, Neighborhoods, NGOs, Health care providers	Near	High
Provide shelter at public places such as bus stops, parks, etc.	7, 8, 14, 15, 18, 21	Extreme heat		LMG	Near	Medium
Reduce non-permeable and heat-absorbing surfaces (e.g., de-paving unneeded parking lots, brownfield sites, etc.)	7, 8, 12, 21	Extreme heat		LMG	Near	Medium
Increase availability and access of community cooling centers (e.g., public pools, spray grounds, etc.	7, 8, 14, 15, 18, 21	Extreme heat		LMG, Community Orgs., Corporations	Mid	Medium
Install public drinking fountains in areas of high vulnerability	7, 8, 12, 15	Extreme heat		LMG	Mid	Medium
Create heat stress action plan that accounts for climate change projections	7, 8, 12, 15	Extreme heat		LMG	Mid	Medium
Explore cooling opportunities via Louisville's natural aquifer	7, 8, 18, 21	Extreme heat		LMG	Mid	Medium

Prioritize and Plan

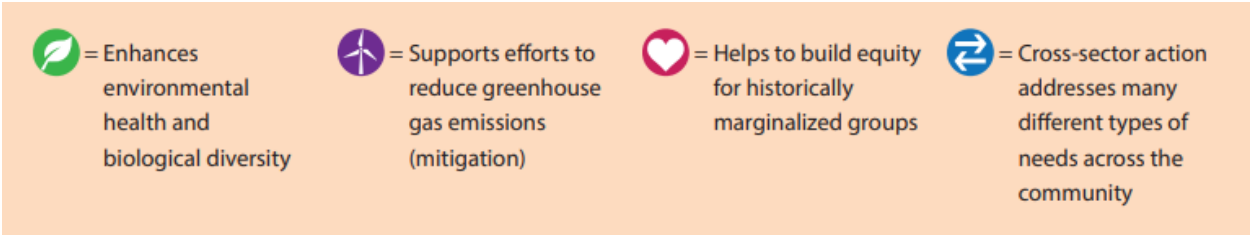
Several rounds of prioritization helped identify the specific actions that Louisville Metro Government would focus on. The first prioritization activity happened at the second stakeholder workshop. At the end of the day, each breakout group presented the objectives and actions they identified to address their assigned vulnerabilities. Participants were given time to walk around the room and read the details of each item. The consultant team then facilitated a dot voting exercise where each participant was able to identify the actions they felt were most important to prioritize by placing a dot sticker next to them. This vote was captured in the spreadsheet created after the event.

The next round of prioritization happened among the Strategy Team members and LMG government staff. They further refined the list of options to identify items to focus on implementing in the first two years. These options included new efforts and existing efforts identified as important to strengthen and/or expand.

The consultant team hosted several community open houses in partnership with local community-based organizations across the planning area. These open houses were designed to educate residents about the planning process and solicit feedback on some of the proposed options. This public feedback was incorporated into the prioritization of the final list of objectives and actions in the plan.

As a public education and outreach tool, the consultant team led the development of a short video. This video provides an overview of the climate trends and vulnerabilities across the community, as well as ways LMG is addressing the challenge.

Finally, the consultant team developed the *Prepare Louisville* plan. The plan included an overview of the historic and future climate trends for the area, a review of the primary vulnerabilities across the community, and a discussion on the importance of equity when addressing climate change. In the plan, specific actions that help to address other important community values such as mitigation, equity, environmental health, and cross-sector approaches were highlighted. This plan was provided for public comment and approved in April 2020.



Take Action

Louisville Metro Government remains committed to implementing the actions identified in the Prepare Louisville plan. The Office of Sustainability continues to support climate resilience building across the community. Since the publication of the final report, the Office of Sustainability was awarded the U.S. Environmental Protection Agency (EPA)'s Climate Pollution Reduction Grant to create a regional Priority Climate Action Plan (PCAP) for the Louisville KY-IN Metropolitan Statistical Area (MSA) including 11 counties in Kentucky and Indiana.