


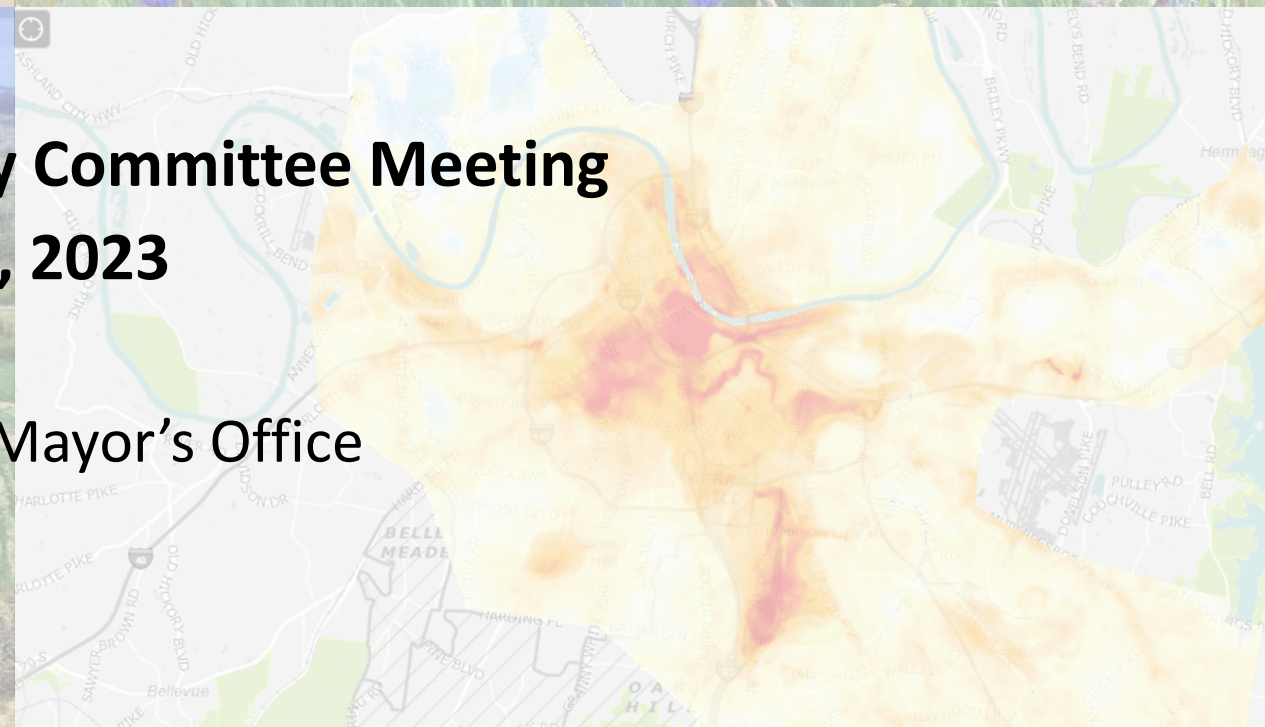


Climate Adaptation and Resilience Planning: *An Overview of Key Initiatives*

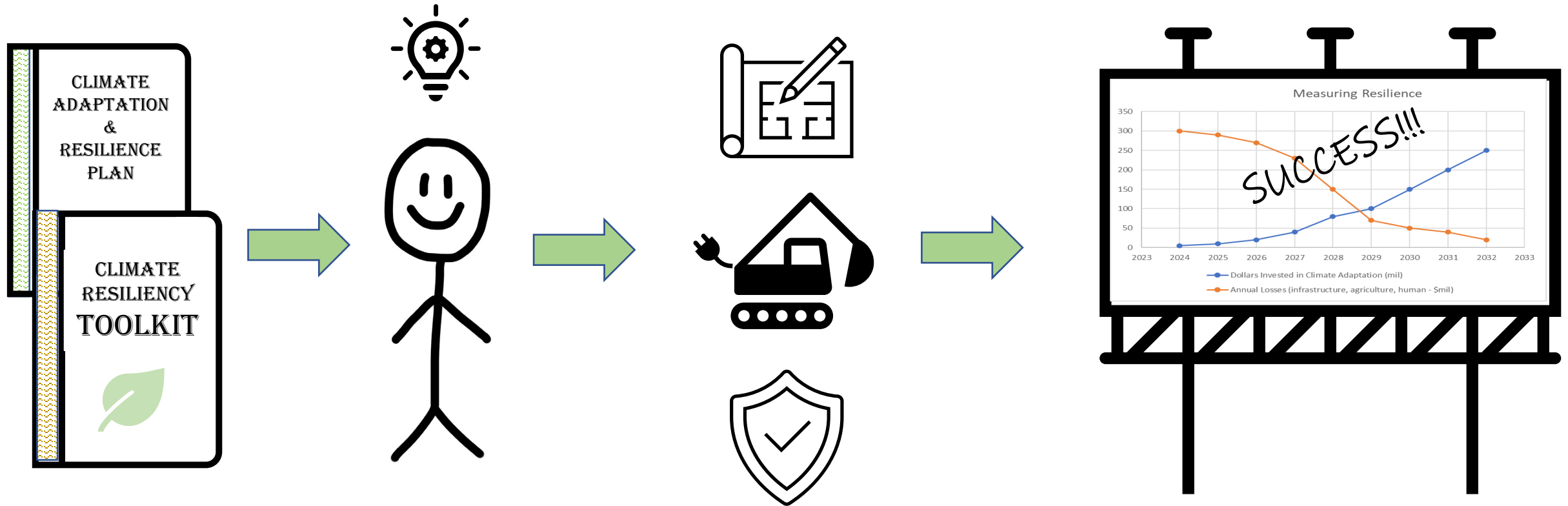


Sustainability Advisory Committee Meeting
July 26, 2023

Kristin Stroup, Mayor's Office



Why Climate Adaptation and Resilience Planning?



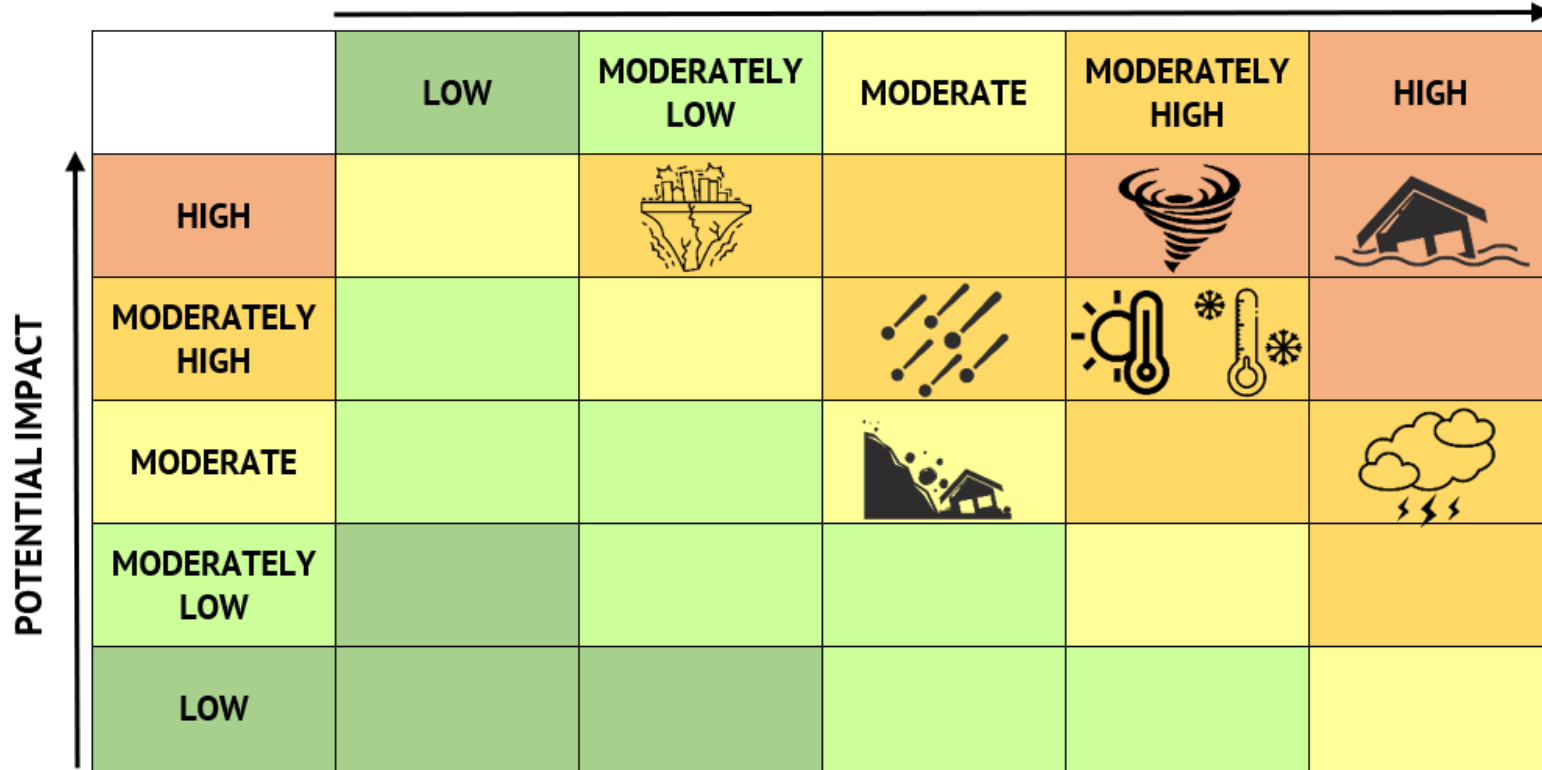
With the proper information and resources, and working as a team off the same playbook, Metro can craft smart policies and programs and guide development in a sustainable and equitable way that protects against growing climate risks, so that we can safeguard Nashville's communities and reduce risks and losses to lives, livelihoods, infrastructure and services.

Climate Adaptation & Resilience Action Plan

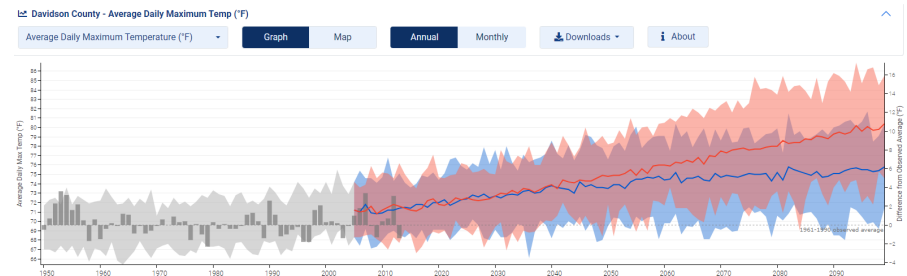
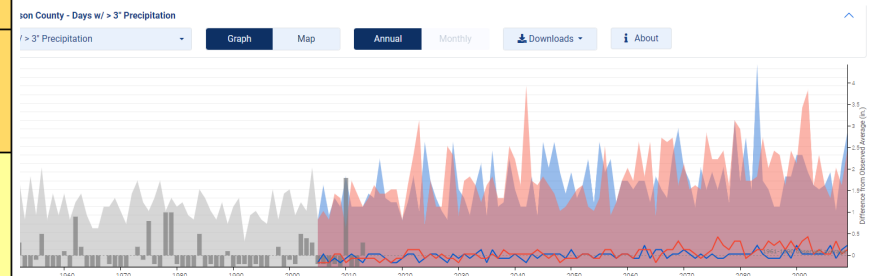
- Objectives include:
 - Build on SAC's Climate Action Plan with focus on adaptation rather than mitigation;
 - Comply with the Global Covenant of Mayors requirements and Reporting Framework;
 - Present an overview of Metro's main climate hazards, including potential severity of impact and likelihood of occurrence;
 - Discuss climate change projections and expected future impacts;
 - Conduct a high-level climate risk and vulnerability assessment from a whole systems perspective;
 - Establish a roadmap for implementation of priority adaptation strategies;
 - Serve as a framework for future department-level Adaptation Plans.
- Intended timing: Report released for public feedback in September.

Metro's Climate Risks

PROBABILITY




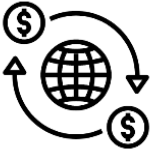




Climate Hazard	Impact	Probability
Cold wave	Mod. High	Mod. High
Hail	Mod. High	Moderate
Heat wave	Mod. High	Mod. High
Landslide	Moderate	Moderate
Thunderstorm	Moderate	High
Flooding	High	High
Earthquake	High	Mod. Low
Tornado	High	Mod. High



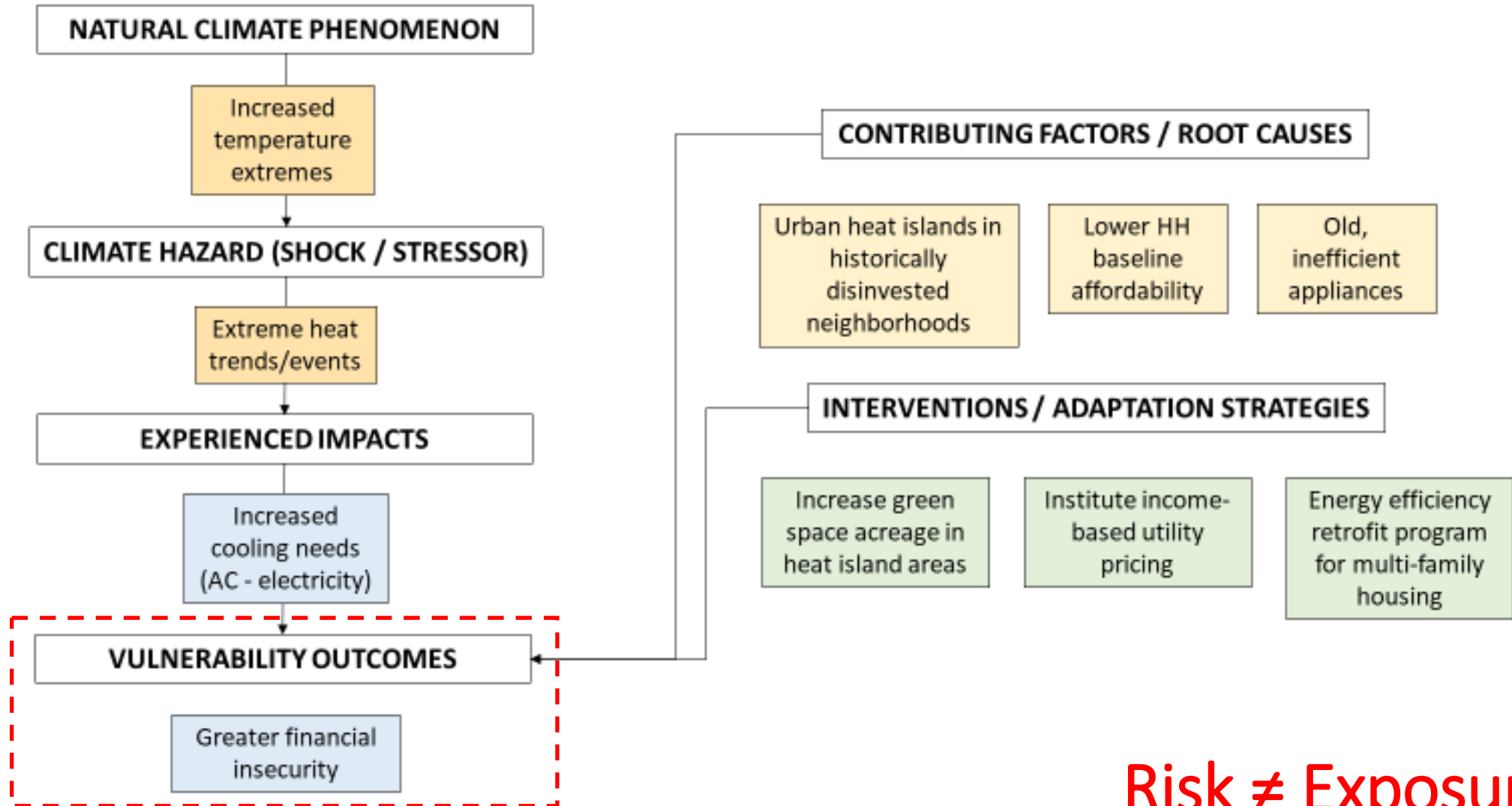
- Ranking based on:
 - FEMA National Risk Index
 - Metro's Multi-Hazard Mitigation Plan (MHMP)

Assessing Risk from a Systems Perspective









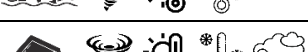
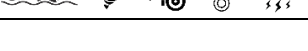



									
Community & Culture		Natural Environment		Infrastructure		Economy		Public Safety	
A	Livelihood and affordability	D	Ecosystem services	H	Energy generation	N	Agriculture	Q	Emergency services
B	Health and wellbeing	E	Flora/forests/trees	I	Energy transmission	O	Supply chain	R	Law and order
C	Access to goods and services	F	Watersheds/hydrology	J	Water supply	P	Business continuity	S	Government Services
		G	Fauna/native species	K	Storm/waste-water and waste mgmt			T	Community Safety
				L	Communications				
				M	Transportation				
Crosscutting: Equity									

 Corresponds to FEMA's community lifelines






Identifying Impacts & Vulnerability Outcomes






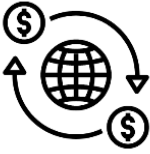

Identifying Impacts & Vulnerability Outcomes Cont.


Applicable Hazards	 Potential Impacts: Community and Culture	Livelihood & Affordability	Health & Wellbeing	Access to Goods & Services	Cascading Vulnerability Outcome(s)?
		A	B	C	
	Damage or destruction to property, homes and small businesses with associated repair, replacement, and/or relocation costs	X			YES
	Chronic housing quality issues such as mold, resulting from climate-related damages	X	X		YES
	Increased cost for or loss of property (home, car, flood, etc.) insurance	X			YES
	Increased energy costs due to extreme temperatures, rising demand	X			YES
	Loss of goods (refrigerated foods and medicines) due to power surge or outage.	X	X		YES
	Missed work, reduced productivity and profitability due to both direct impacts (heat waves, flooded roads) and indirect impacts (fatigue, memory and attention issues, poor sleep)	X			YES
	Missed school and reduced educational outcomes	X			YES
	Loss of life or bodily injury.	X	X		YES
	Worsening pre-existing health conditions: <ul style="list-style-type: none"> Asthma and cardiovascular disease caused by air pollution; Heat-related illness (heat rash, heat exhaustion, and heat stroke) and death, including cardiovascular failure; Respiratory allergies and asthma resulting from increasing allergens; Changes in vector ecology and water quality impacts leading to increased incidence of diseases such as Lyme disease and leptospirosis; Increased physical and mental stress as a result of exposure to hazardous conditions and post-disaster recovery efforts. 		X		YES
	Disruption in supply chain resulting in scarcity or high cost of goods including medicines.	X	X	X	YES
	Inability to leave the home or receive support.	X	X	X	YES
	Inability to access good and services for those lacking air-conditioned personal or public transportation; increased travel risk for those who go regardless		X	X	YES

Potential Adaptation Strategies

Applicable Hazards	 Adaptation Strategies: Public Safety	Emergency Services	Law and Order	Government Services	Community Safety	Targeted (Vulnerable Population) or Universal?
		Q	R	S	T	
	<p>Review and Improve Field Staff Department Safety Standards (Included in Infrastructure)</p> <p>Description: Review existing standards, equipment, personal protective equipment (PPE), and practices for outdoor workers to ensure they are adequate in light of projected climate hazards to protect worker health and safety during extreme weather events.</p> <p>Resources: California OSHA, Shade and Other Cooling Measures</p> <p>City Examples:</p> <ul style="list-style-type: none"> Washington State: Ambient Heat Exposure Protections 	X	X	X		YES
	<p>Conduct Resilience and Readiness Training Exercises and Drills</p> <p>Description: Management and staff of relevant agencies need to be educated and trained in Metro’s climate risks and anticipated impacts, including planning for extended power outages and curtailment scenarios. OEM currently offers a Community Emergency Response Team (CERT) training, which could be replicated in a more condensed, climate resilience-focused version for Metro staff(CERT Lite), which would include proactive identification of vulnerable communities and infrastructure.</p> <p>Resources:</p> <ul style="list-style-type: none"> Climate Hazard Readiness Toolkits: https://www.ready.gov/business <p>City Examples:</p> <ul style="list-style-type: none"> City of Austin, TX: Get Involved: CERT Training 	X	X	X	X	YES
	<p>Develop Adaptation Plan for Critical Infrastructure (included under Infrastructure)</p> <p>Description: Similar to the recommendation under Infrastructure for utility providers, departments responsible for emergency management and response should work together to develop actionable strategies to harden built and transportation assets critical to service provision, focusing on resilience to extreme temperatures and withstanding flood waters.</p> <p>Resources:</p> <p>City Examples:</p>	X	X	X	X	YES
	<p>Review and Optimize Asset Management Programs (included in Infrastructure)</p> <p>Description: Efficient and consistent asset management is fundamental to achieving readiness, redundancy, and recoverability. Readiness planning will help to identify areas where redundancy is lacking so that procurement of missing equipment can be prioritized. Reviewing historical facility and maintenance data can help to identify assets</p>	X	X	X	X	YES

Prioritizing Components at Highest Risk

									
Community & Culture		Natural Environment		Infrastructure		Economy		Public Safety	
A	Livelihood and affordability	D	Ecosystem services	H	Energy generation	N	Agriculture	Q	Emergency services
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				M	Transportation				
Crosscutting: Equity									

 Assessed to be at highest risk

The Goal: A 5-Year Implementation Roadmap

- Aim of the Plan:

- Provide a catalog of Best Practice adaptation strategies that address the highest levels of system vulnerabilities in Metro.
- Prioritize those strategies that:
 - ❖ Will make the biggest impact;
 - ❖ Are within Metro's control;
 - ❖ Target the livelihoods and wellbeing of Metro's frontline and vulnerable communities;
 - ❖ Are achievable in the near term without requiring substantial capital infusion.
- Establish 5-year implementation plan to guide Metro planning and investments, and enhance department accountability.
- Provide valuable information to the public and a means to solicit feedback.
- Create mechanism for ongoing cross-department collaboration after Plan is finalized and released.

- What's Next:

- Let's discuss!
- Your input will help us craft the 5-year implementation plan.

Guiding Questions:

Breakout Rooms:

- 1) Community and Culture
- 2) Natural Environment
- 3) Infrastructure
- 4) Economy & Public Safety

Instructions:

- 1) 12 minutes:
 - a) Review impacts and potential strategies as a group.
 - b) Discuss, using these questions as a guide.
- 2) 8~ minutes:
 - a) Each group reports key takeaways (2 min. each)

- Which adaptation strategies do you believe are most important for Nashville to prioritize?
- Are there adaptation strategies you believe are less worthwhile or inappropriate?
- Are there adaptation strategies that are not included that you think need to be included?
- Are there any lessons learned from the Climate Action Plan that should be considered to optimize the successful implementation of this Adaptation Plan?
- What's the best way to make sure this plan is institutionalized and results in action?

Appendices

How are Sustainability and Resilience different?

Sustainability	Resilience
Focus is on MITIGATION, e.g. slowing or eliminating the trends and practices that are changing the climate, in particular greenhouse gas (GHG) emissions.	Focus is on ADAPTATION, e.g. modifying and hardening our built environment and supporting systems to better withstand extreme weather events, and RESPONSE PREPARATION.
EXAMPLE actions:	EXAMPLE actions:
1. Reducing energy generation from fossil fuels and increasing generation from renewable sources like solar, wind, and geothermal power.	1. Installing on-site or “distributed generation” systems (micro-grids) that are independent from grid power and less likely to be disrupted by outages.
2. Optimizing building and appliance design to reduce energy consumption and waste generation.	2. Updating building codes and design requirements to account for increasing flood levels, temperature extremes, severe storms (e.g. tornados), etc.
3. Reducing single-car trips and traditional vehicle travel by improving public transportation, electric vehicle and transit options, car-sharing, biking, etc.	3. Creating emergency evacuation plans focused on the needs of the carless and the movement impaired.
4. Increasing conservation lands and easements to sequester carbon, support biodiversity, and provide enrichment for current and future generations.	4. Requiring low-impact development (LID) practices like pervious pavements and rain gardens to reduce the volume of stormwater runoff.

Metro Department Collaboration

- A parallel effort and key Adaptation Plan strategy has comprised development of an internal **Metro Climate Resiliency Toolkit**
- Objective:
 - Develop a standardized toolkit that will embed *equitable* sustainability and resilience screening into each Department or Agency's strategic planning and budgeting processes;
 - Establish a shared understanding and approach to building resilience within Metro;
 - Be responsive to multiple levels of Metro departments' needs, from field staff to upper-level management.
- Strategy:
 - Provide information and resources to improve staff understanding of needs and opportunities;
 - Provide tools to enhance decision making and cross-department efficiency;
 - Build upon success of Metro's Budget Equity Tool and embed resilience screening into annual processes.
- Intended timing: Finalized and actioned this fall.

Metro Department Collaboration Cont.

- Key strategy for development of the Toolkit: Design Dash Workshop 3-Part Series
 - Generously hosted at The Wond'ry during June – August;
 - Workshop 1 sought to identify toolkit opportunities and barriers, and ideate content;
 - Workshop 2 sought to review draft toolkit contents, and ideate **climate impacts and adaptation strategies**;
 - Workshop 3 will aim to finalize the toolkit and agree on key goals and actions for Metro departments.
- Key strategy for adoption and achieving results:
 - Toolkit is aligned with annual budgeting review processes.
- Inter-departmental Committee will advance Toolkit in following years.