

# Climate Resilience Action Plan

## for City of Austin Assets and Operations



**Joint Sustainability Committee**

May, 2018



# 2013, 2015 & 2016 Floods



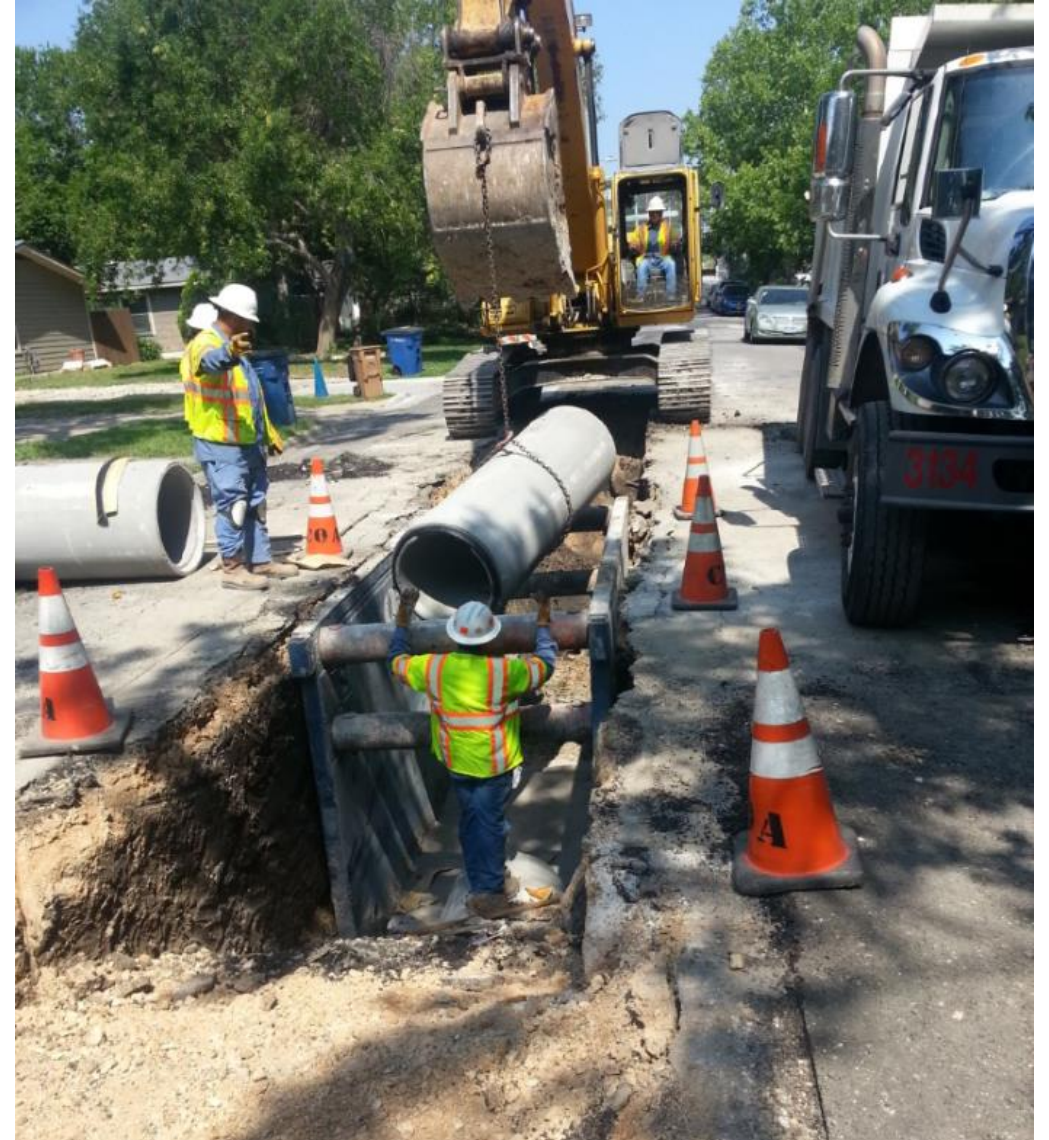
**Emergency Response**

**Staff Safety**

**Existing/New  
Facilities & Infrastructure**

# Agenda

- Background & Climate Hazards
- Vulnerability Assessment
- Action Areas
- Next Steps



# Resilience for cities

The ability of individuals, communities, institutions, businesses and systems within a city to survive, adapt and thrive no matter what kinds of chronic stresses and acute shocks they experience.

**Rockefeller Foundation 100 Resilient Cities initiative**

# Acute Shocks

- Earthquake
- Hurricane
- Wildfire
- Flooding
- Extreme heat
- Infrastructure or building failure
- Terrorism
- Toxic spill
- Disease outbreak
- Riot/civil unrest

# Chronic Stresses

- Extended drought
- High unemployment
- Poverty
- Affordable housing shortage
- Food insecurity
- Poor air quality
- Traffic congestion
- Aging infrastructure

# Acute Shocks

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- Hurricane
- **Wildfire**
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# Chronic Stresses

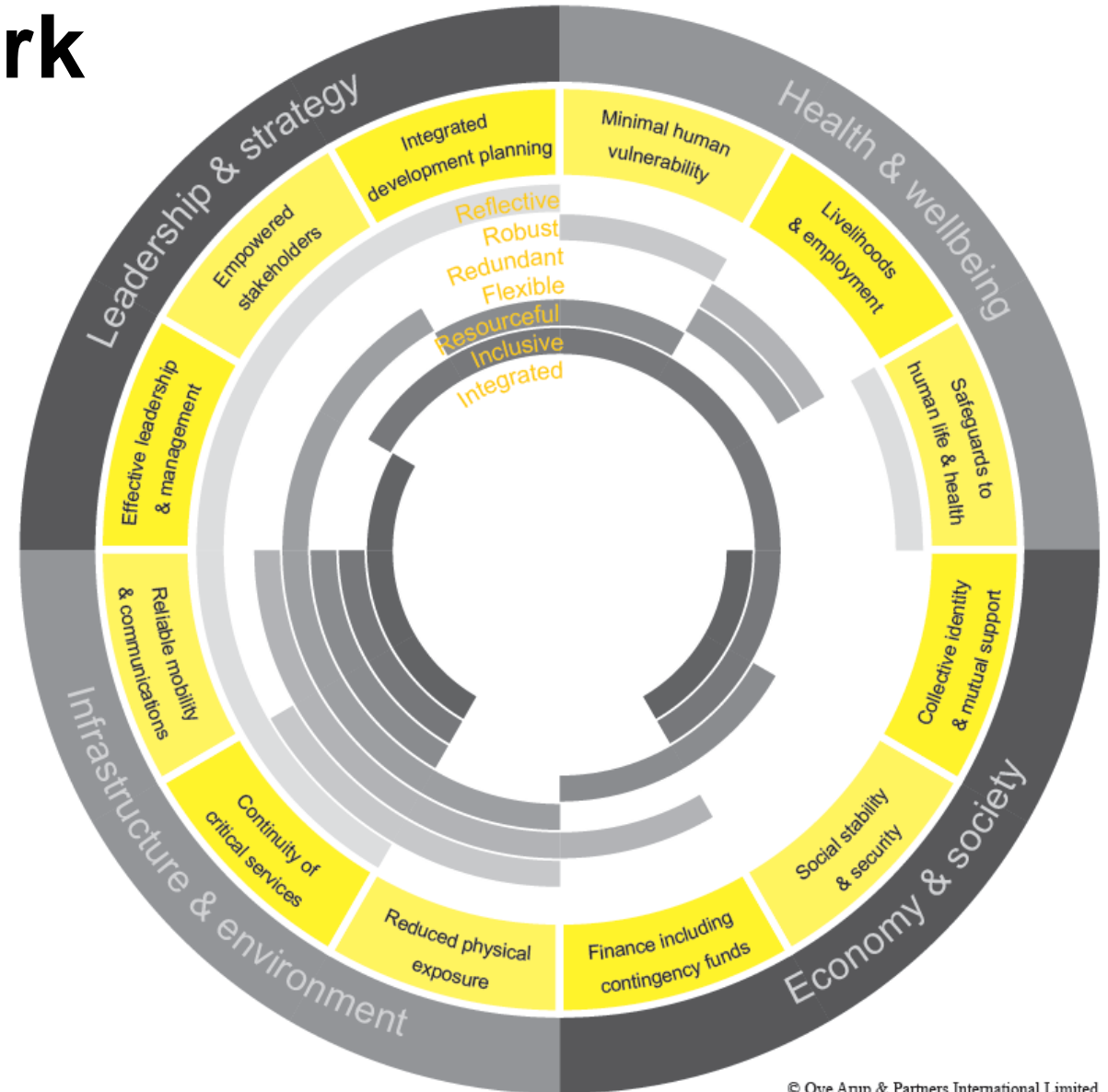
- **Extended drought**
- High unemployment
- Poverty
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- Traffic congestion
- Aging infrastructure

\* **Climate-related shocks and stresses**

# City Resilience Framework

*Developed by Arup for Rockefeller Foundation*

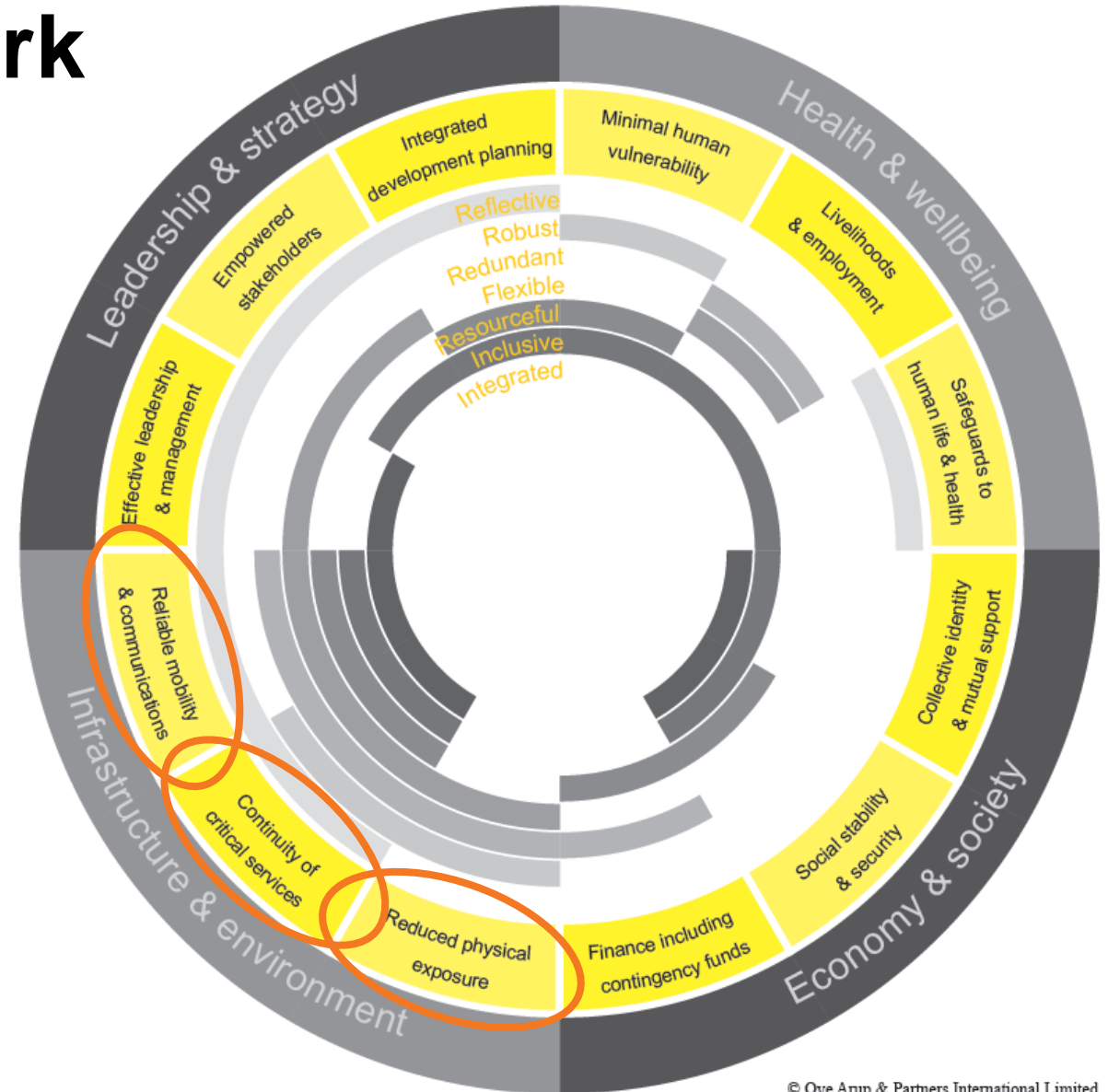
- Leadership & Strategy
- Infrastructure & Environment
- Economy & Society
- Health & Well-being



# City Resilience Framework

*Developed by Arup for Rockefeller Foundation*

- Leadership & Strategy
- Infrastructure & Environment
  - Reliability of mobility
  - Continuity of critical services
  - Reduce physical exposure
- Economy & Society
- Health & Well-being





# Council Resolution 20150604-048

Adopted the **Austin Community Climate Plan**, which recommends:



**Austin** COMMUNITY  
2015  
CLIMATE PLAN

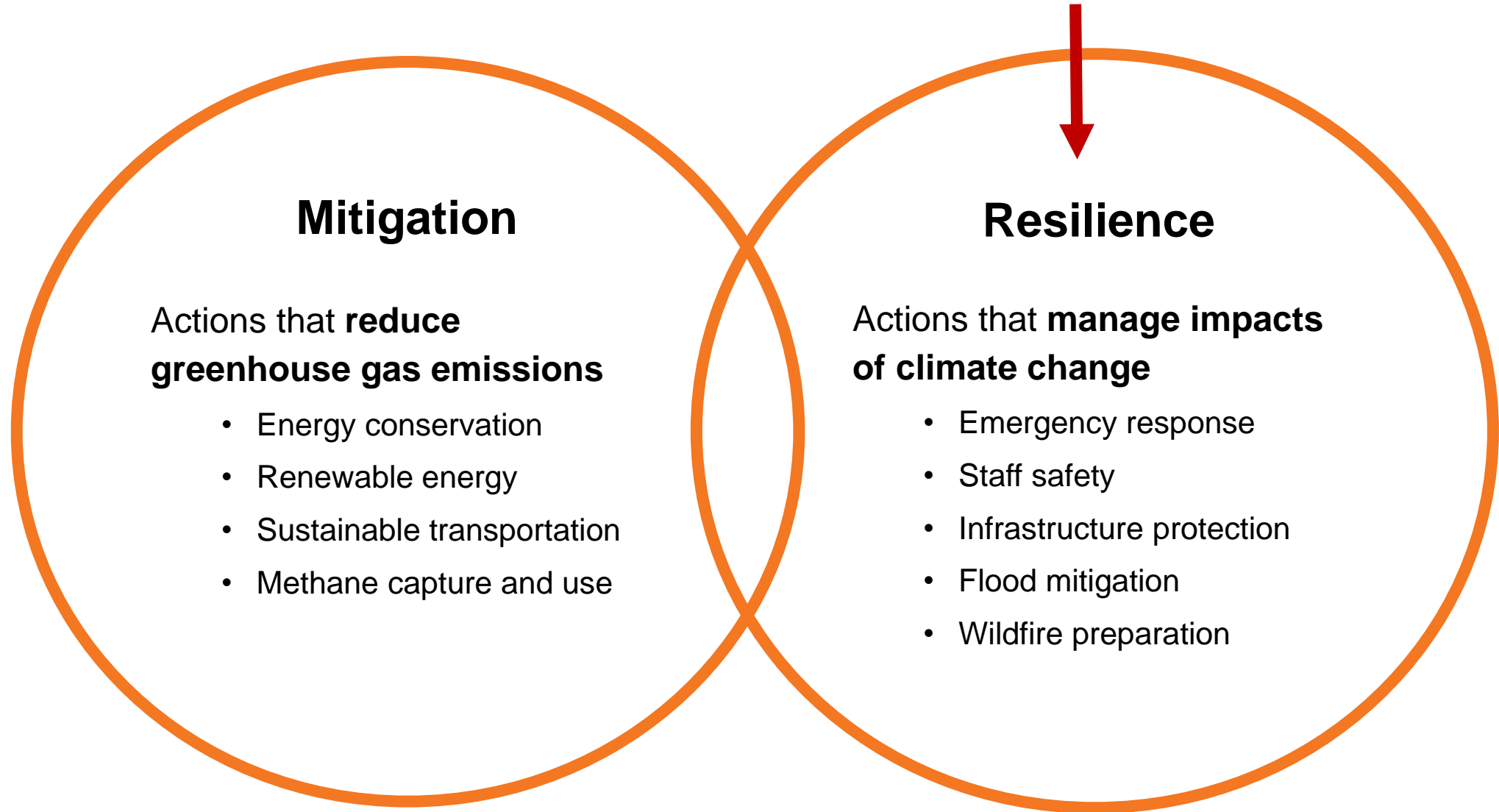


Further study of **climate projections** for Central Texas

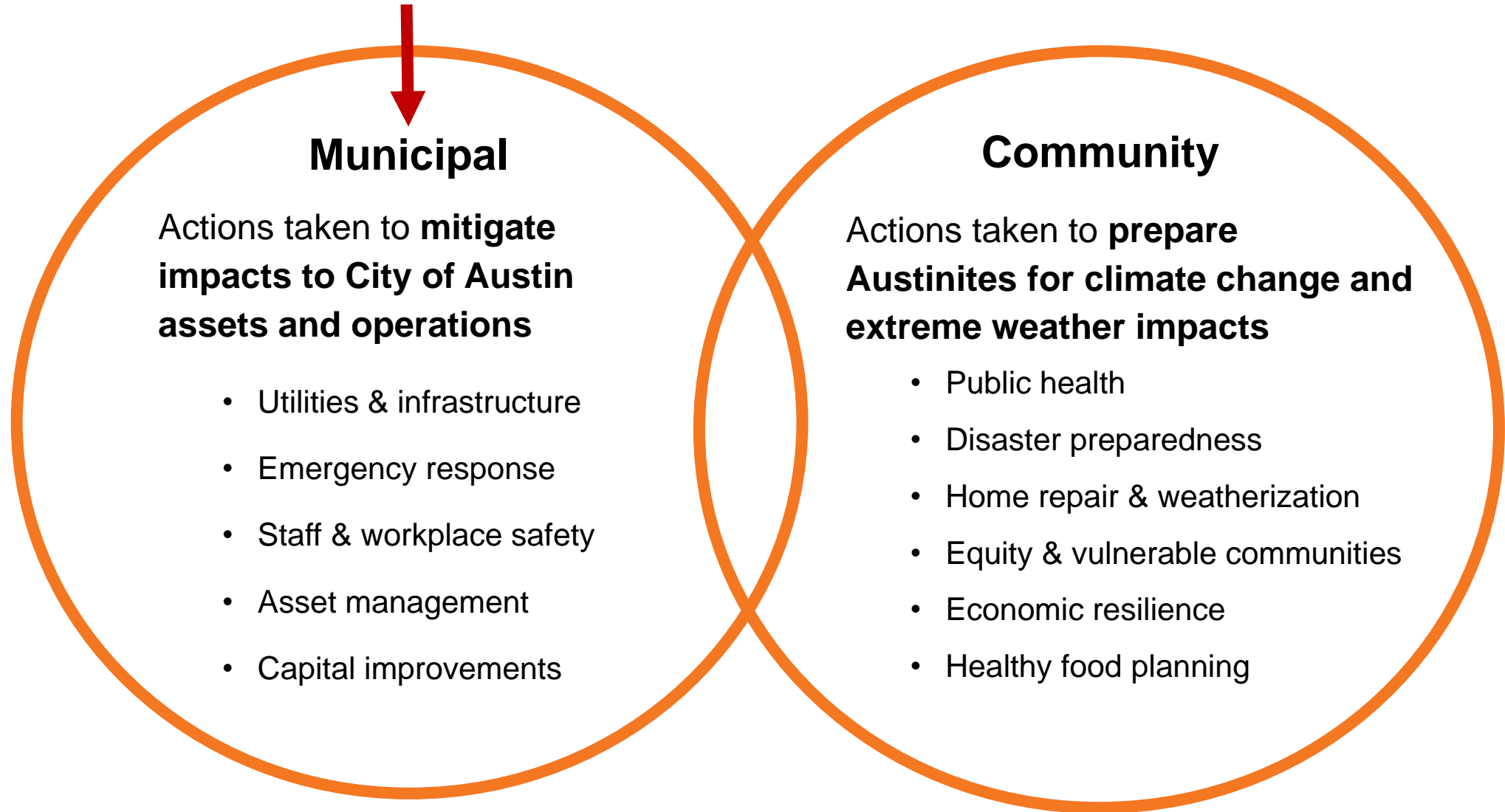
Climate resilience planning:

- conduct **vulnerability assessments**
- identify strategies to **protect City operations, assets, and infrastructure**

# Climate Mitigation vs. Resilience



# Elements of **Municipal** vs. **Community** Resilience

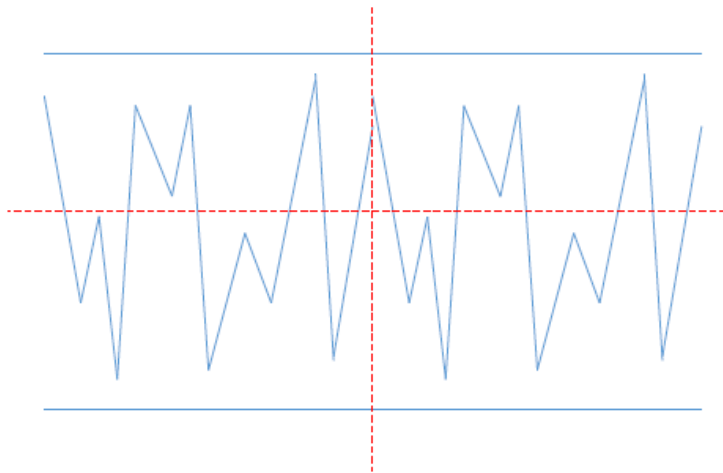


**A climate resilient Austin is prepared for and responsive to extreme weather events and changing climate conditions.**



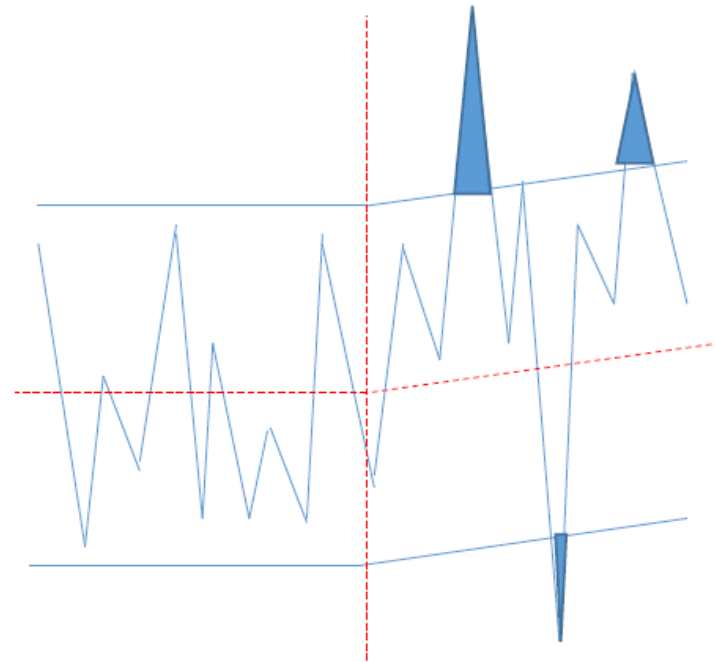
# Climate Change: Game Changer

**The past = the future**



vs.

**Uncertain future**



**Climate projections = increase in shocks/stressors**

# Climate Projections

## Austin-specific climate projections

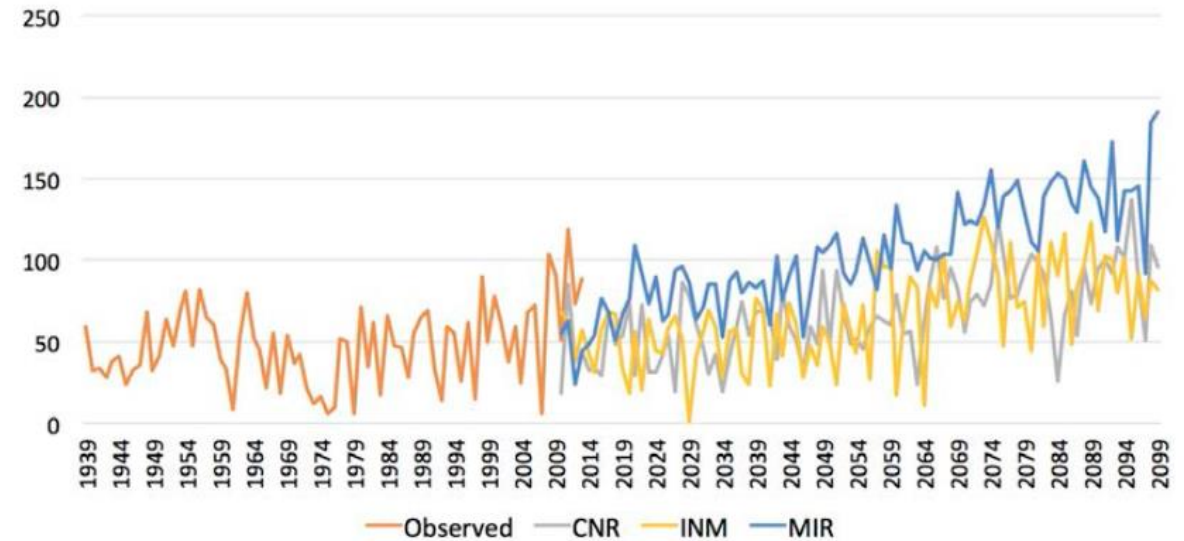
by Dr. Katharine Hayhoe

### The science is **certain** that we will see:

- Increases in average & extreme temps
- More frequent drought conditions
- Increased wildfire risk
- More frequent extreme precipitation

### The science is **less certain** that we will see:

- Change in annual average precipitation
- Increase in humidity & heat index
- Increase in strength/frequency of hurricanes



The number of days per year with temperatures above 95°F at the Camp Mabry weather station in Austin, TX.

GEOS Institute

# Climate Extremes already being experienced in Austin



# Climate Resilience Activities Timeline





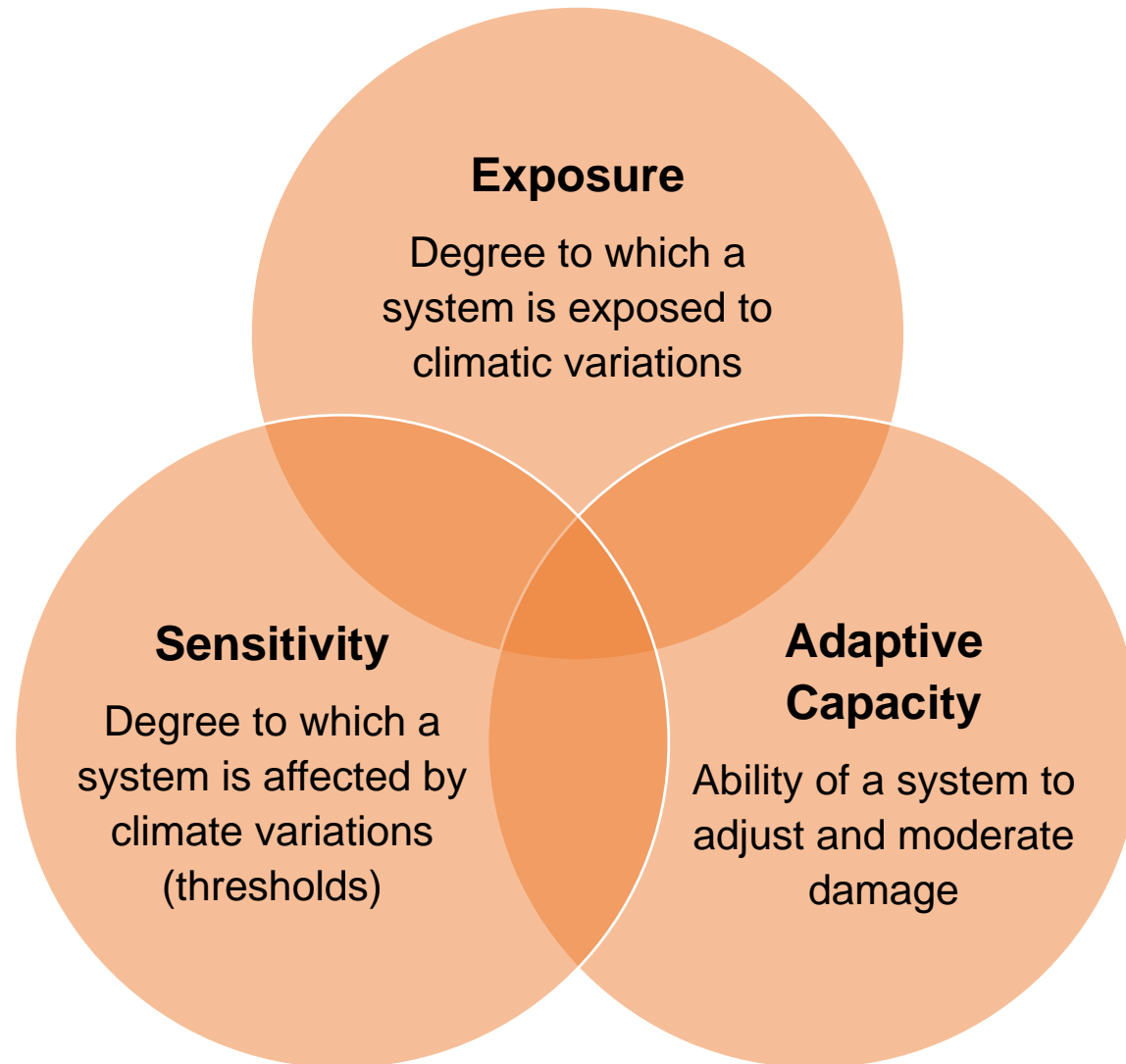
# Climate Resilience: Department Partners

- Office of Sustainability
- Homeland Security and Emergency Management
- Austin Fire
- Watershed Protection
- Public Works
- Communications and Technology Management Department
- Austin Convention Center
- Austin Water
- Austin Energy
- Austin Parks and Recreation
- Austin Public Health
- Austin Public Libraries
- Austin Transportation



# Vulnerability Assessment

# Vulnerability = Exposure, Sensitivity, Adaptive Capacity



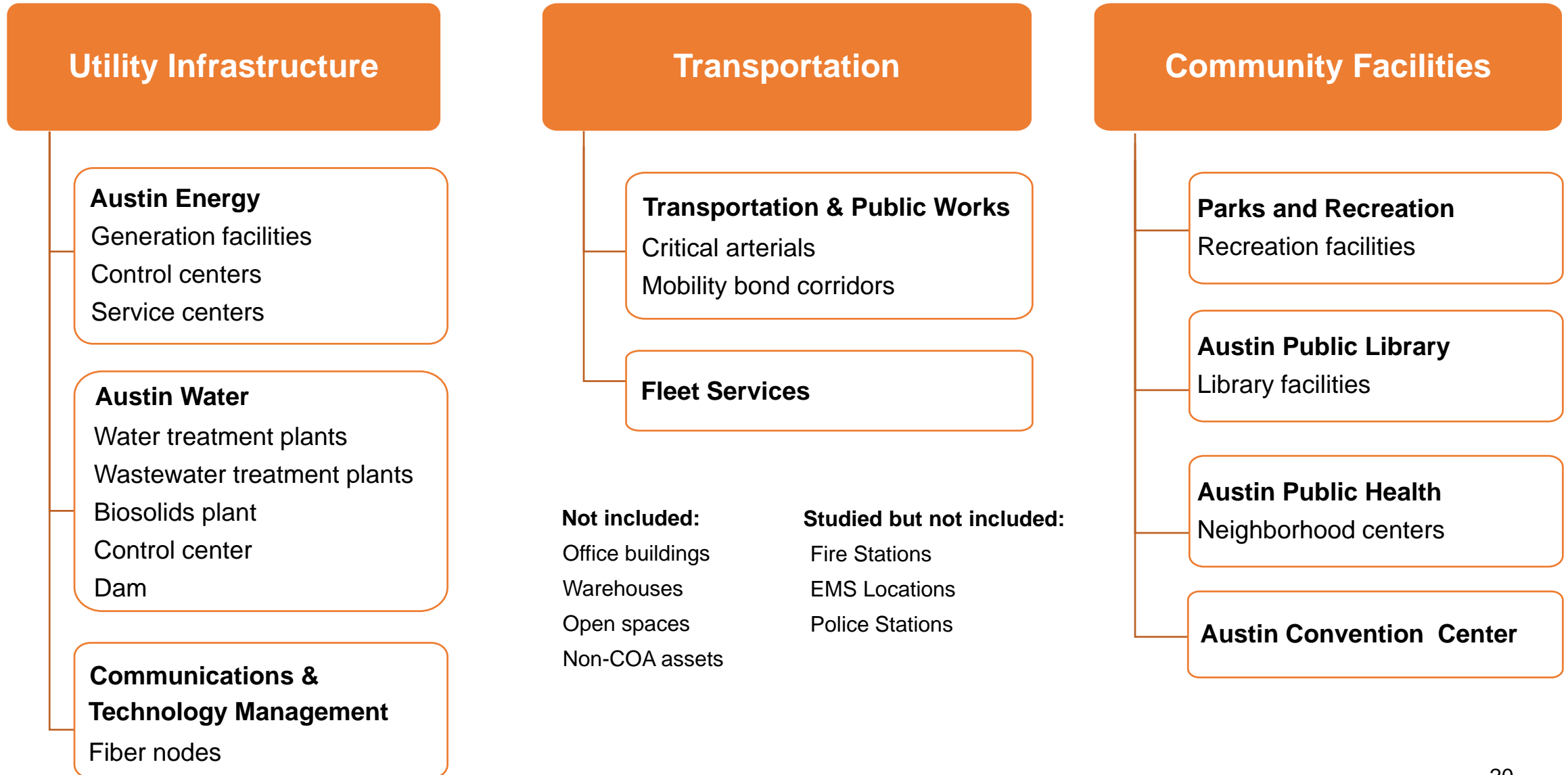
## To minimize vulnerability:

- Reduce exposure
- Reduce sensitivity
- Increase adaptive capacity

## Process:

1. Identify Climate Hazards
2. Conduct Vulnerability Assessment
  - a. Criticality assessment
  - b. Threshold to hazard
3. Identify Resiliency Strategies & Actions

# Project Scope: Assets



# Project Scope: Operations



## Relevant Strategic Outcomes and Strategies:



### Safety

“Collaboratively and comprehensively assess the vulnerabilities and interdependencies that exist for critical City infrastructure.”



### Health & Environment

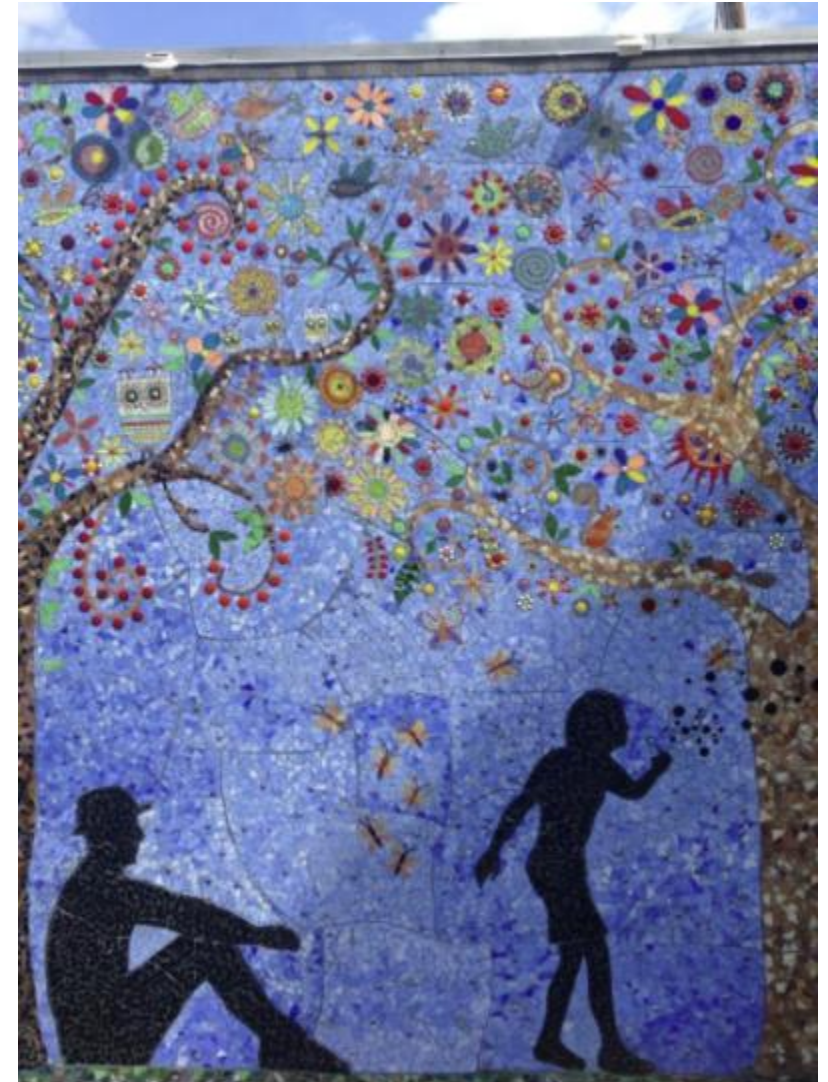
“Prepare existing and new City infrastructure, along with residences and buildings most at risk, for the impacts of a changing climate...”



### Government that Works

“Ensure reliable utility service through maintaining power, water, wastewater, and stormwater infrastructure...”

# City Council Priorities



# Resilience Action Areas

# Action Areas

## Emergency Response

- Emergency Procedures
- Safe Emergency & Evacuation Routes
- Disaster Response Resources

## Staff Safety

- Field Staff & Workplace Safety
- Hazard Training

## Existing Facilities & Infrastructure

- Critical Infrastructure
- Building Efficiency & Redundancy
- Telecommunications

## New Facilities & Infrastructure

- Design for Resilience
- Plan for Resilient Infrastructure



# Emergency Response: Sample Actions

## Emergency Procedures

**ACTION:** Establish basic disaster response and recovery training leadership. – HSEM: In Development

## Evacuation Routes

**ACTION:** Analyze evacuation procedures for City staff during extreme events. - HSEM: In Development

## Resource Coordination

**ACTION:** Create a chain of command to mobilize resources during emergencies. - HSEM: In Development

**ACTION:** Investigate City mass sheltering capacities for future disasters. - HSEM: In Development



# Staff Safety: Sample Actions

## Hazard Training

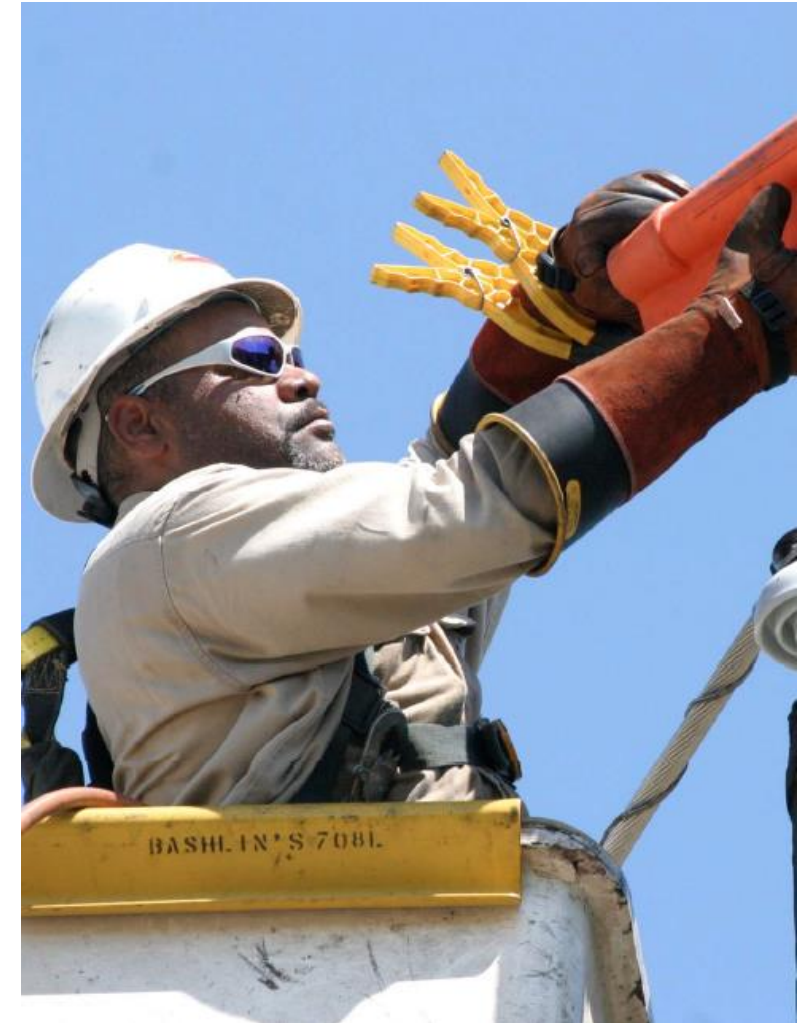
**ACTION:** Provide basic climate and weather hazard training to staff. - **HSEM: In Development**

## Field Staff Safety

**ACTION:** Evaluate work schedules and safety policies for field staff working in harsh outdoor conditions. – **HR: In Development**

## Workplace Safety

**ACTION:** Consider mitigation strategies to reduce air quality and heat impacts at the workplace. –  
**HR: New Initiative**



# Existing Facilities & Infrastructure: Sample Actions

## Harden Critical Infrastructure

**ACTION:** Identify potential adjustments to paving materials and specifications to account for increasing temperatures. – PWD & ATD: In Development

## Redundant Power for Critical Facilities

**ACTION:** Provide critical facilities with an alternative source of electricity during emergencies. – PARD, APH & APL: New Initiative

## Mitigate Impacts to Telecommunications

**ACTION:** Create a catalog of information on backup power and cooling capabilities at network node locations. – CTM: New Initiative



# New Facilities & Infrastructure: Sample Actions

## Design for Resilience

**ACTION:** Co-locate new community facilities in areas lacking access to City services. Ensure facilities have capacity to serve as emergency shelters. -

**PARD, APH & APL: In Development**

## Plan for Resilient Infrastructure

**ACTION:** Avoid construction in 500-year floodplain where possible OR provide flood-proofing. – **WPD: New Initiative**

**ACTION:** Evaluate the risk of financial impact of having major utility facilities offline for a prolonged period of time during/after major weather events. –

**AE & AW: New Initiative**



# Next Steps

# Next Steps: Communication & Reporting

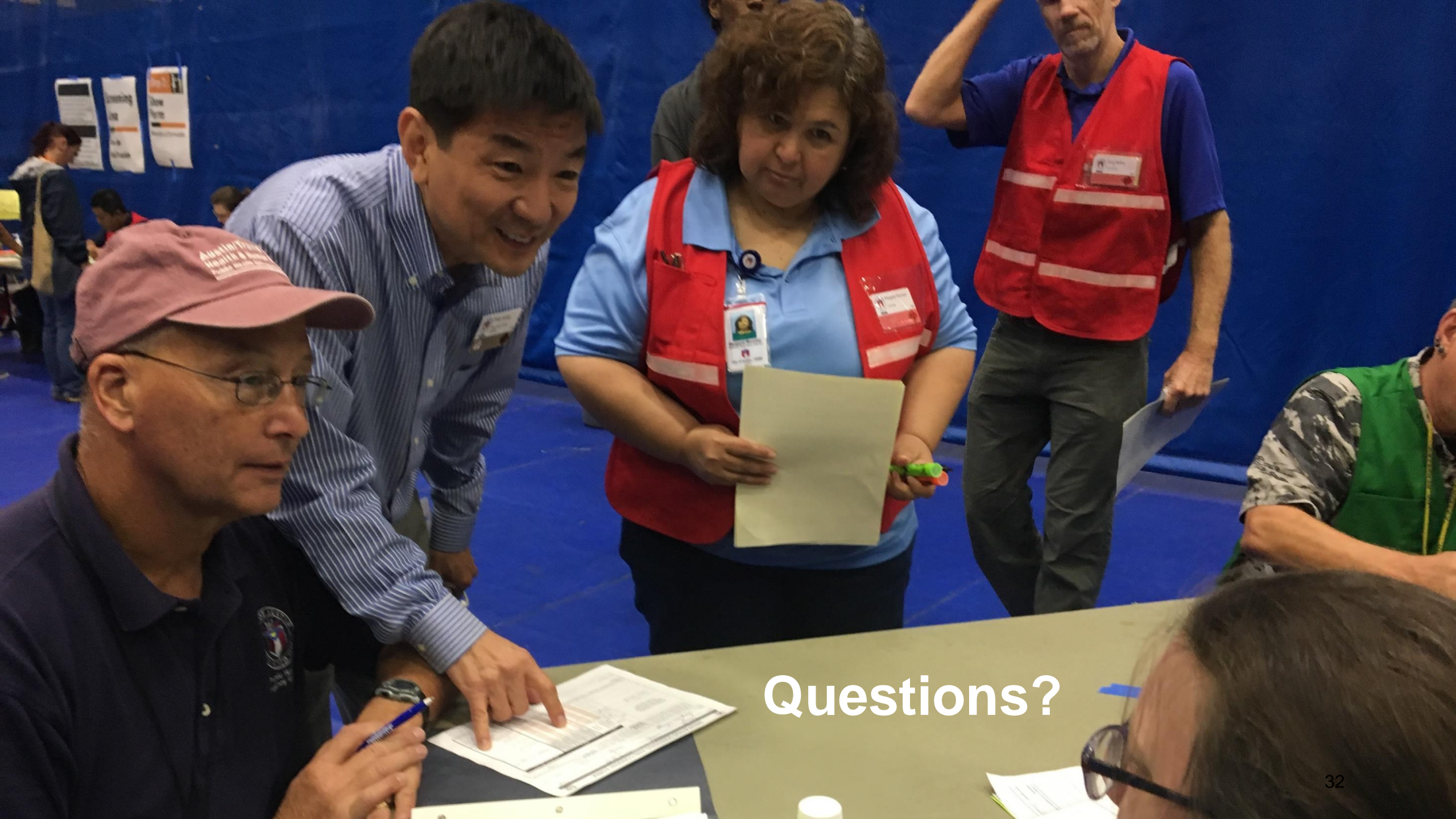
- Provide annual updates on progress
- Offer briefings to:
  - Council
  - Boards & Commissions
  - Travis County & other regional partners



# Next Steps: Implementation

- Continue Departmental implementation of near-term actions
- Dpt. Budget planning for long-range actions
- Director-level **Resilience Leadership Team** plus ongoing staff workgroup





Questions?



# Extra slides

Strengthen Emergency Response				
Actions		Lead Department(s)	Status	Resources
<b>Update and Institutionalize Emergency Procedures</b>				
Phase 1 2018-2020	<b>Disaster Training for Leadership.</b> Establish basic disaster response and recovery training for elected officials and City leadership.	Homeland Security and Emergency Management	Initiative in Development	Current Budget
<b>Establish Safe Emergency and Evacuation Routes</b>				
Phase 1 2018-2020	<b>Community Evacuations.</b> Establish and update emergency evacuation routes and procedures for communities prone to extreme flooding and wildfire events. Study ingress/egress to and from flood and wildfire-prone neighborhoods and identify potential safety hubs for residents.	Homeland Security and Emergency Management Watershed Protection Austin Fire	Initiative in Development	Current Budget
	<b>City Staff Evacuations.</b> Analyze emergency and evacuation procedures for City of Austin staff during extreme events. Study ingress/egress to and from City facilities. Work with institutions adjacent to City facilities to plan ingress and egress routes.	Homeland Security and Emergency Management	Initiative in Development	Current Budget
<b>Optimize Coordination of Disaster Response Resources</b>				
Phase 2 2020-2030	<b>Shuttle Mobilization Policy.</b> Create a chain of command to mobilize fleet shuttles during evacuation events.	Fleet Services	Initiative in Development	Current Budget
	<b>Shelters.</b> Investigate the City of Austin's mass sheltering capacities and evaluate the need for additional locations to shelter people displaced by extreme weather events both locally and regionally.	Homeland Security and Emergency Management	Initiative in Development	Current Budget
	<b>Resource Inventory.</b> Create an inventory of City resources available for use during emergencies, including portable generators, traffic management equipment, backup fans, communications technology, disaster comfort kits, and other equipment. Create a chain of command to mobilize resources before, during, and after major events.	Homeland Security and Emergency Management	Initiative in Development	Current Budget
	<b>Resource Needs.</b> Investigate the need for additional resources required to support sheltering efforts, such as translation services, additional bathrooms and shower facilities, case management staff, etc. Establish and update standing contracts with disaster response and recovery service providers and update pay policies for exempt employees.	Homeland Security and Emergency Management	Initiative in Development	Current Budget

<b>Augment Staff Safety Plans</b>				
<b>Actions</b>		<b>Lead Department(s)</b>	<b>Status</b>	<b>Resources</b>
<b>Phase 1</b> 2018-2020	<b>Hazard Training.</b> Provide climate and weather hazard identification, response, and safety training to City of Austin staff, especially fieldworkers.	Human Resources Department Safety Groups	New Initiative	Current Budget
	<b>Fieldworker Safety.</b> Evaluate work schedules and safety policies for City of Austin fieldworkers during extreme heat days, poor air quality days, and other climate-related health risk days. Establish cross-departmental best practices	Human Resources Department Safety Groups	Initiative in Development	Current Budget
<b>Phase 2</b> 2020-2030	<b>Workplace Safety.</b> For facilities and maintenance shops without air conditioning or with poor ventilation, consider upgrades to mitigate heat and air quality impacts on workers.	Austin Energy Austin Water Parks and Recreation Fleet Services	New Initiative	Capital Budget Impact TBD

Evaluate and Upgrade Existing Facilities and Infrastructure				
Actions		Lead Department(s)	Status	Resources
<b>Harden Critical Infrastructure</b>				
Phase 1 2018-2020	<b>Pavement Materials.</b> As part of the review of new paving technology, identify potential adjustments to pavement materials and equipment/materials specifications to account for increasing summer temperatures. Consider increasing use and frequency of preventive maintenance treatments that would address accelerated pavement wearing (e.g., seal coats, crack seals).	Public Works	Existing Initiative	Capital Budget Impact TBD
	<b>Access to Community Facilities.</b> Investigate the impacts of higher average temperatures on access to community facilities and update mobility plan to mitigate for heat.	Austin Transportation	Initiative in Development	Capital Budget Impact TBD
Phase 2 2020-2030	<b>Infrastructure Hardening.</b> Study the potential impact of increased flooding of adjacent roads and utility infrastructure and explore hardening options (flood control measures, erosion-resistant materials, etc).	Public Works Austin Water	Initiative in Development	Capital Budget Impact TBD
	<b>Flood-Proofing Utilities.</b> Investigate options for strengthening and flood-proofing the utilities at the Austin Convention Center.	Austin Convention Center	New Initiative	Capital Budget Impact TBD
	<b>Impacts of Shifting Soils.</b> Investigate impacts of elastic soils on gas tanks and other underground infrastructure at service centers and identify mitigation options.	Fleet Services	New Initiative	Capital Budget Impact TBD
<b>Improve Building Efficiency and Redundancy</b>				
Phase 2 2020-2030	<b>Building Update.</b> Upgrade aging building systems based on current code requirements, conditions assessments and energy/water audits at critical community facilities, including recreation centers, neighborhood centers, and libraries.	Parks and Recreation Austin Public Health Austin Public Libraries	Initiative in Development	Capital Budget Impact TBD
	<b>Redundant Power.</b> Provide critical facilities (shelters) with at least one alternative, independent source of electricity supply to make it capable of operating if a primary source of power experiences an interruption. If an uninterruptible power supply (UPS) or energy storage system is used, it must be capable of providing power for at least 8 hours.	Parks and Recreation Austin Public Health Austin Public Libraries	New Initiative	Capital Budget Impact TBD
	<b>Backup Cooling.</b> Explore options for backup cooling at the Austin Convention Center.	Austin Convention Center	New Initiative	Capital Budget Impact TBD
<b>Mitigate Impacts to Telecommunications</b>				
Phase 2 2020-2030	<b>Network Node Hardening.</b> Investigate network node locations and create a catalog of information on backup power and cooling capabilities for each. Identify opportunities to improve weatherization and mitigate flood impacts.	Communications and Technology Management	New Initiative	Capital Budget Impact TBD
	<b>Wildfire Risk Mitigation for Radio Infrastructure.</b> Determine which radio towers are at risk for wildfire and investigate mitigation options.	Communications and Technology Management	New Initiative	Capital Budget Impact TBD

Future-Proof New Facilities and Infrastructure				
Actions		Lead Department(s)	Status	Resources
<b>Design for Resilience</b>				
Phase 1 2018-2020	<b>Passive Survivability.</b> Develop Passive Survivability Guidelines for capital projects in areas projected to be impacted by climate hazards.	Austin Energy Green Building	Initiative in Development	Current Budget
Phase 2 2020-2030	<b>Resilience Hubs.</b> Co-locate new community facilities in areas experiencing increases in poverty and isolation. Ensure new facilities have the capacity to serve as shelter and evacuation centers and/or disaster response hubs.	Austin Parks and Recreation Austin Public Health Austin Public Libraries	Initiative in Development	Capital Budget Impact TBD
<b>Plan for Resilient Infrastructure</b>				
Phase 1 Ongoing	<b>Resilient Infrastructure.</b> Continue exploring opportunities to incorporate climate change variables in future infrastructure decision-making and share information among infrastructure and utility departments. Work with the Resilience Leadership Team to identify new opportunities increase the resilience of City of Austin facilities and infrastructure.	Office of Sustainability	Existing Initiative	Current Budget
	<b>Water Supply Impacts.</b> Continue to study potential climate impacts on Austin's water supply in collaboration with the Water Utility Climate Alliance, regional climate agencies, and climate scientists.	Austin Water	Existing Initiative	Current Budget
	<b>Stormwater Infrastructure.</b> Update Intensity, Duration, Frequency curves used by stormwater infrastructure designers to inform the sizing of new infrastructure.	Watershed Protection	Existing Initiative	Current Budget
	<b>Urban Forest Canopy.</b> Develop an urban forest climate change adaptation strategy for the Austin area.	Development Services	Initiative in Development	Current Budget
Phase 2 2020-2030	<b>Floodplain Management.</b> For critical infrastructure development and redevelopment, avoid construction in the 500-year floodplain altogether where possible and provide flood proofing if construction must occur in the floodplain such as freeboard above the 500-year floodplain.	Watershed Protection	New Initiative	Capital Budget Impact TBD
	<b>Financial Impacts.</b> Evaluate the risk of financial impact of having major utility facilities offline for a prolonged period of time during/after major weather events.	Austin Energy Austin Water	New Initiative	Capital Budget Impact TBD