Introduction to Adaptation Strategies
Chattanooga - 4 October 2022 - Eric Mielbrecht
Adaptation Planning Process

PHASE 1: Explore, Define, and Initiate

PHASE 2: Assess Vulnerability

PHASE 3: Define Adaptation Framework & Strategies

PHASE 4: Implement, Monitor, Evaluate, & Adjust

Outreach & Engagement
Defining Adaptation

Adaptation refers to efforts to reduce the negative effects or take advantage of the opportunities provided by climate change.

Adaptation strategies aim to reduce the impacts of climate change and/or increase the resilience of human, built, and natural systems.
Using Vulnerability Results in Adaptation

Reduce climate impacts (likelihood & consequence)

Increase climate resilience (adaptive capacity)

Reduce climate change vulnerability
Increase shading on pedestrian walkways, transit stops, and around county facilities

Use cool pavement materials or reflective coatings to reduce heat absorption

Reduce stormwater runoff within residential neighborhoods that flood frequently
Using Vulnerability Results in Adaptation

**Consequence (minimize effects)**

- Retrofit or reroute pedestrian/bicycle trails and bridges in areas that are subject to flooding
- Plant heat- and drought-tolerant native species in landscaping projects
- Provide free transportation to cooling centers

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Adaptive Capacity (*improve ability to cope*)

- Offer professional development opportunities for staff to develop their technical expertise and skills to prepare for and respond to climate change impacts
- Create policies that encourage solar and other renewable energy generation
- Build partnerships between public, private, and nonprofit sectors to provide critical services to vulnerable populations
Adaptation strategies can reduce vulnerability through:

- Programmatic activities
- Plans, regulations, policies
- Capital improvement/infrastructure projects
- Knowledge/evaluation activities
- Coordination/collaboration activities
Programmatic Activities

Strategies aimed at creating new or expanding existing programs, activities, or initiatives

Examples:

• Establish a shuttle system to cooling centers

• Integrate climate into public health programs and create a website that details health risks exacerbated by climate change and provides information that helps residents prepare for and respond to impacts

• Develop low-income energy programs
Strategies aimed at developing or revising policies, plans, regulations, or guidelines

Examples:

• Create hazard recovery plans and prioritize restoration of vital facilities and assets
• Revise zoning regulations to prohibit certain land uses in high-risk areas
• Require all new construction to make provisions for on-site stormwater management
Strategies designed to address physical and functional deficiencies or needs in the built and natural environment

Examples:

- Construct water storage facilities and install efficient plumbing fixtures and equipment in buildings to conserve water
- Install heat-reducing roofs
- Fill in the basements of homes within the 100-year floodplain
- Use permeable pavement and rain gardens to reduce stormwater runoff
Strategies that aim to gather information about climate changes, impacts, and/or management effectiveness

• *May be a precursor to implementing another type of strategy*

**Examples:**

• Inventory bridges and culverts to determine which are at high risk of failure during future storm events

• Explore feasibility of supply side diversification and resilient electrical distribution infrastructure to facilitate access to local, decentralized renewable energy
Strategies that focus on strengthening partnerships and relationships, communicating information, expanding awareness, or coordinating across organizational, jurisdictional, or political boundaries

Examples:

• Encourage neighborhoods to become familiar with residents who have skills and tools to assist others with special needs (e.g., develop maps and inventories of neighborhood assets)

• Work with local medical providers and hospitals to ensure that medical facilities are prepared to meet periods of increased demand
Maladaptation

Actions that may lead to increased risk of adverse climate-related outcomes, increased vulnerability to climate change, or diminished welfare, now or in the future. - IPCC 2014

Example:

Relying solely on air conditioning in private homes to address extreme heat stress where energy is fossil fuel based.

- Renewable energy
- Reflective roof, building envelope
- Shared cooling centers
Making Decisions in a Changing Climate

New/different activities

Assess potential climate change-induced population migration within and to the county

Current/same activities

Educate public on water conservation

Modifications to current activities

Plant drought-tolerant vegetation around municipal buildings

Adaptation reflects the intentional consideration of climate change…but activities are not always different.

Modified from Swanston et al. 2017
Annual average temperatures are expected to increase up to 4.5°F. Summer temperatures will be even greater.

Shade trees and a robust urban forest act as a natural cooling mechanism for urban areas.

The city of Chula Vista’s Climate Change Working Group recommended that a shade tree ordinance be adopted so shade trees are incorporated into all municipal improvement projects and all private development parking lot projects.
Case Study: Chula Vista Shade Tree Ordinance

One of 11 strategies recommended by the City Climate Change Working Group to be implemented over three years.

Action 1: Develop formal shade tree policy
Action 2: Amend Municipal Landscape Manual
Action 3: Requirement in updated City Design Manual

Performance Metrics: Number of new projects incorporating new shade tree standard

- 2011 City of Chula Vista Climate Adaptation Strategies Implementation Plans
- 2013 City of Chula Vista Climate Adaptation Strategies Implementation Progress Report
- 2017 Chula Vista Climate Action Plan