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
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

Likelihood → Risk → Vulnerability

Consequence → Adaptive Capacity
Using Vulnerability Results in Adaptation

↓ Likelihood \((limit \ change)\)

- 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
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
Using Vulnerability Results in Adaptation

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
Case Study: Spaulding Rehabilitation Hospital

- Purchase and remediation of contaminated brownfield site on Boston Harbor (at sea level)
- Construction of new building to replace existing hospital

Boston, MA
STEP 1. IDENTIFY CLIMATE + NON-CLIMATE IMPACTS

• Sea level rise, flooding, extreme heat

STEP 2. DETERMINE ACTIONS THAT COULD REDUCE IMPACTS

• ACTION: Move critical infrastructure/patient care functions above the first floor
  ✓ Continuity of care even during floods

• ACTION: Allow patient windows to open
  ✓ People remain comfortable/safe even if the cooling system goes down

• ACTION: Add triple-glazing and sunshades to windows
  ✓ Increase energy efficiency and block heat
STEP 2 (CON’T). DETERMINE ACTIONS THAT COULD REDUCE IMPACTS

• ACTION: Elevate the hospital above likely flood range
  ✓ Prevents flood damage and loss of services

• ACTION: Create on-site combined heating/power system
  ✓ Increase energy efficiency
  ✓ Provides redundancy in case of power loss/generator malfunction

• ACTION: Add green roof and on-site stormwater drainage network
  ✓ Reduces stormwater discharge and allows rapid drainage to minimize flooding
Questions?

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