Managing Urban Landscapes for Climate Action

A Strategy Development Guide for Communities & Local Governments to Manage Urban Landscapes & Organic Resources to Achieve Climate Action & Community Resilience Objectives

Overarching Goal

To support cities in developing climate action strategies by creating an urban landscape management opportunity assessment that addresses mitigation, adaptation & resilience, and equity.

Focus Area

Identifying and aligning city departments to work towards shared community resilience objectives and climate action goals through the equitable management of urban landscapes and organic resources.

This Guide

This document will enable users to go through the process of creating an urban landscape-based climate action opportunity assessment for their city using a combination of their city's planning documents, stakeholder engagement, and external analysis tools.

THE TRUST FOR PUBLIC LAND
University of Colorado Boulder
CENTER FOR REGENERATIVE SOLUTIONS
CITY OF BOULDER

Table of Contents

CENTER FOR REGENERATIVE SOLUTIONS

Acknowledgements

University of Colorado Boulder, Master of the Environment Program (MENV): Ariana Borrello, Alex Giles, Maddy Nesbit, and Daniela Uribe are graduate students in the **University of Colorado Boulder's MENV program**. They created this guide as part of their capstone project in partnership with the **City of Boulder** and the **Center for Regenerative Solutions**. They would like to express deep gratitude to the numerous individuals and organizations that were essential to the development of this guide. **Gretel Follingstad** was a continuous source of support for the MENV team as the academic advisor for this capstone project. Her ability to guide the scope of this project, review initial concepts and drafts, and provide expertise was invaluable. The following faculty, **Rachel Bigby**, **Kimberly Kosmenko,** and **Lydia Lawhon**, of the University of Colorado Boulder MENV program provided valuable support and constructive recommendations during the planning, research, and development of this project.

Center for Regenerative Solutions (CRS): Brett KenCairn, Senior Policy Advisor for Climate and Resilience for the City of Boulder and Director of CRS, provided immense knowledge, patience, guidance and enthusiasm throughout this project. Brett's dedication to transformative and effective climate action not only inspires but reminds us all why this guide is an essential tool to combating climate change.

Resource Specialists: Dr. Jonathan Wachter was a constant thought partner and generous contributor to various elements of this guide. Our team could not have conceptualized this guide without his pioneering work developing the framework for a landscape-based climate action approach and exploring the potential for such exercises across different urban contexts. He has generously allowed us to borrow extensively from his work in this project and throughout this document. **Calla Rose Ostrander,** Natural and Working Lands Climate Change Coordinator at California Natural Resources Agency was a key resource surrounding organic management along with her process guide.

The Trust for Public Land (TPL): Taj Schottland and **Brendan Shane** of TPL provided their expertise in the use and application of the UDI TPL decision support tool.

Urban Sustainability Directors Network: Finally, thank you to the many members of the **Urban Sustainability Directors Network** who engaged deeply with early versions of this guide and contents. **Dr. Susanna Sutherland** shared indispensable knowledge, insights, and resources from decades of working in urban climate and sustainability planning.

Thank you to everyone who worked on this project for the feedback, enthusiasm, and the work being done to advance climate action goals around the world.

CENTER FOR
REGENERATIVE
SOLUTIONS

Introduction Video

Managing Urban Landscapes for Climate Action

Brett KenCairn: Senior Policy Advisor for Climate and Resilience for the City of Boulder and Director of the Urban Drawdown Initiative

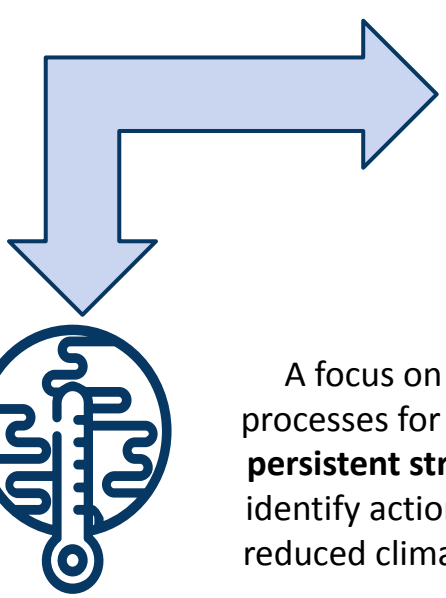
Watch video here: click to play

CENTER FOR REGENERATIVE SOLUTIONS

The Big Picture: Core Climate Action Objectives

Mitigation, Adaptation & Resilience, and Equity

Climate action must be grounded in **three overarching objectives**:

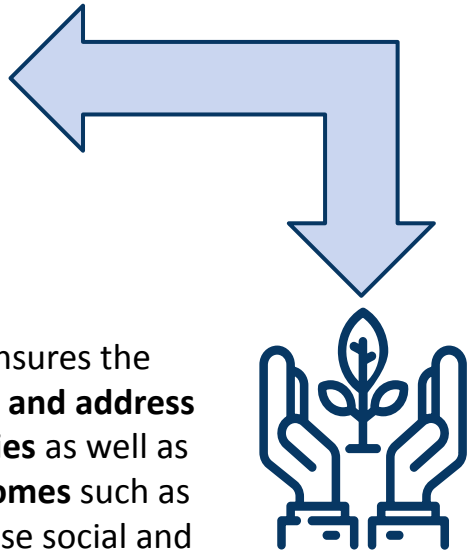


Climate Mitigation

Carbon Reduction and Sequestration
Support climate stabilization by **reducing emissions** and **sequestering carbon** into stable living systems.

Equity

Intersectional Benefits
A focus on equity-based implementation ensures the processes for developing actions are **inclusive and address persistent structural race and class inequalities** as well as identify actions that **enhance equitable outcomes** such as reduced climate hazards & risks and/or increase social and economic opportunities.



Adaptation & Climate Resilience

Change Management
Strengthen community capacity to **absorb, adapt to, or transform disruptive change forces** to thrive in a changing climate.

CENTER FOR REGENERATIVE SOLUTIONS

Managing Urban Landscapes for Climate Action

A New Approach to Stabilizing Climate and Protecting Communities

A powerful and often overlooked way to pursue climate action in urban areas is by **harnessing and amplifying the abilities of the living landscapes** in and around cities. This both **captures carbon and uses this carbon to enhance critical life support services** (shade for heat management, water infiltration for stormwater management, capturing pollutants for increased air, water, & soil quality, pollinator protection for increased biodiversity etc.) This guide will provide a framework and guidance for cities to **assess climate action opportunities through the lens of urban landscapes and organic resources management** with respect to **mitigation, adaptation & resilience, and equity**.

Climate Mitigation

- Carbon Sequestration
- Emissions Reduction

Adaptation & Climate Resilience

- Heat Management
- Reduced Drought Risk
- Reduced Flood Risk
- Reduced Fire Risk
- Improved Air & Water Quality
- Increased Biodiversity

Equity

- Equity-Based Economic Opportunities
- Equitable Distribution of Ecosystem Services

CENTER FOR REGENERATIVE SOLUTIONS

Climate Mitigation

Intersections of Urban Landscapes Management & Climate Action

Managing urban landscapes for climate action can yield **significant benefits for mitigation objectives**. These ecosystem service benefits are described below:

Climate Mitigation | Adaptation & Climate Resilience | Equity

Carbon Sequestration

Process where carbon dioxide is removed from the atmosphere and used in living systems which leads to the eventual decline of carbon dioxide in the atmosphere (carbon drawdown).

Emissions Reduction

A reduction in carbon dioxide (CO2) emissions or CO2 equivalent (CO2e) emissions into the atmosphere.

CENTER FOR REGENERATIVE SOLUTIONS

Adaptation & Climate Resilience

Intersections of Urban Landscapes & Climate Action

Managing urban landscapes for climate action can yield **significant benefits for adaptation and resilience objectives**. These ecosystem service benefits are described below:

Climate Mitigation	Adaptation & Climate Resilience	Equity

Heat Management	Management of temperatures, generally in the summertime, that are hotter and/or more humid than average temperatures, which can cause heat-related deaths and illnesses as well as ecosystem disruptions and die-offs.
Reduced Drought Risk	The probability of drought and the assets at risk from drought hazards.
Reduced Flood Risk	The probability of flooding and the assets at risk from flooding hazards.
Reduced Fire Risk	The probability of fire and the assets at risk from fire hazards, most likely located in the wilderness urban interface (WUI) for urban settings.
Improved Air & Water Quality	The measure of the suitability of water and air for specific purposes like ecosystem or human use (ex: drinking and breathing).
Increased Biodiversity	The variety of life in an urban ecosystem.

CENTER FOR REGENERATIVE SOLUTIONS

Equity

Intersections of Urban Landscapes & Climate Action

Managing urban landscapes for climate action can yield **significant benefits for equity objectives**. These ecosystem service benefits are described below:

Climate Mitigation | Adaptation & Climate Resilience | **Equity**

Equity-Based Economic Opportunities

Jobs and other economic benefits such as quantified ecosystem services provided by management of the urban landscape systems.

Equitable Distribution of Ecosystem Services

Ecosystem services provided or the benefits/good provided to society from just and sustainable ecosystem management (ex: mental and physical well being, clean water and air, biodiversity, etc.).

CENTER FOR REGENERATIVE SOLUTIONS

Building an Urban Landscape Climate Action Strategy

Core Elements: Why Would A City Choose to Embark on this Journey?

INTEGRATION WITH EXISTING CLIMATE ACTION GOALS

Many communities have **multiple climate related plans and strategies** such as emissions reductions plans, resilience & adaptation plans, and equity & social justice plans. A first step in developing an urban landscape-based climate strategy is to **identify key goals** across these plans that could be **addressed through landscape-based climate actions**.

ALIGN ACROSS DEPARTMENTS

Urban landscapes are managed by multiple agencies. A critical initial step in this process is to work with these entities to identify **areas of alignment and potential partnerships** across departments and communities to **meet shared objectives**. This may result in new and shared **funding opportunities, knowledge sharing, and collaboration**.

IDENTIFY AND PRIORITIZE OPPORTUNITIES

The opportunity assessment process outlined in this guide will support a **multi-department/multi-stakeholder** process of **identifying opportunities to achieve and surpass climate action objectives** across the three climate action areas (mitigation, adaptation & resilience, and equity).

QUANTIFY AND ANALYZE OPPORTUNITIES

With opportunities identified, the guide provides a process for conducting initial prioritization of opportunities that can then be **quantified and analyzed for impact and feasibility of implementation.**

CENTER FOR REGENERATIVE SOLUTIONS

Managing Carbon Flow in Urban Landscapes

Understanding the Role of Carbon in Urban Climate Action

CARBON AS A RESOURCE

Managing urban ecosystems and resource flows begins with the idea that **carbon is a resource** to be utilized in living systems to achieve climate and equity objectives. The benefits associated with sequestering carbon and managing it in urban landscapes not only lowers carbon in the atmosphere but it also serves to improve **resilience to climate change impacts** (e.g., heat island impacts, drought, flooding, extreme weather). If managed strategically, captured or sequestered carbon in the form of **augmented plant growth and increased soil-carbon-water cycling creates enhanced "ecosystem services"** (e.g. shade for heat management, water infiltration for stormwater management, capturing pollutants for increased air, water, & soil quality, pollinator protection for increased biodiversity, etc.).

BEYOND MITIGATION: EQUITY & SOCIAL JUSTICE

Managing urban ecosystems and resource flows can also improve **social equity** by directing ecosystem benefits towards **vulnerable and underserved** parts of urban areas. If these actions are conducted in ways that create new economic opportunities in historically underserved communities, they also help to build **economic equity and social justice.**

This strategy development guide outlines ways to create opportunity assessments that can serve as a starting point for bringing together and aligning **carbon sequestration goals (climate mitigation), ecosystem service opportunities (adaptation & resilience), and the needs of a city's communities (equity)**. (1)

Source: (1) Introduction to Ecosystem-based Carbon Management Opportunities in Urban Landscapes.

CENTER FOR REGENERATIVE SOLUTIONS

The Importance of Carbon Flows in Urban Landscapes

In this video, Dr. Jonathan Wachter reviews carbon flows in urban landscapes, highlighting a **holistic approach to management for ecosystem services** in terms of mitigation, adaptation & resilience, and equity.

Click to play video.

CENTER FOR
REGENERATIVE
SOLUTIONS

Urban Landscapes and Organic Resources

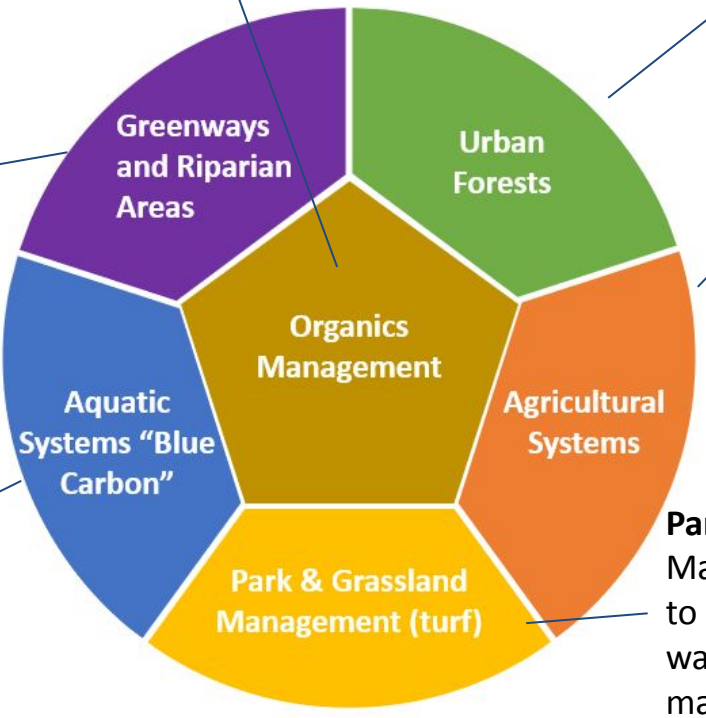
Management Systems with High Potential for Climate Action

There are **five urban landscapes** and **one organic resource management system** with high potential for ecosystem-based climate actions in or adjacent to urban areas:

Organics Management
Using a community's organic "waste" as a resource rather than direct it to a landfill

Urban Forests
Tree populations in urban settings which form green infrastructure

Greenways & Riparian Areas
Management of greenways and riparian areas for habitat protection, water quality enhancement, floodplain management, recreation, and cultural resources



Agricultural Systems
Urban agriculture systems like community gardens and agricultural land managed by a municipality

Aquatic Systems
This refers to water-based systems that have significant carbon cycling and sink roles e.g. wetlands, estuaries, coastal systems

Parks & Grassland (Turf)
Management of parks and open space to preserve and protect natural areas, water resources, recreation, floodplain management, and aesthetic value

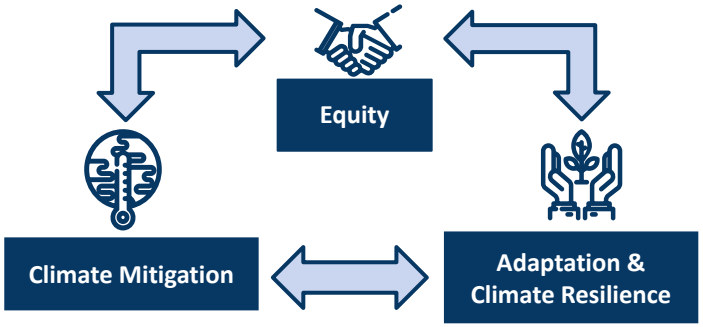
CENTER FOR REGENERATIVE SOLUTIONS

Frameworks Combined

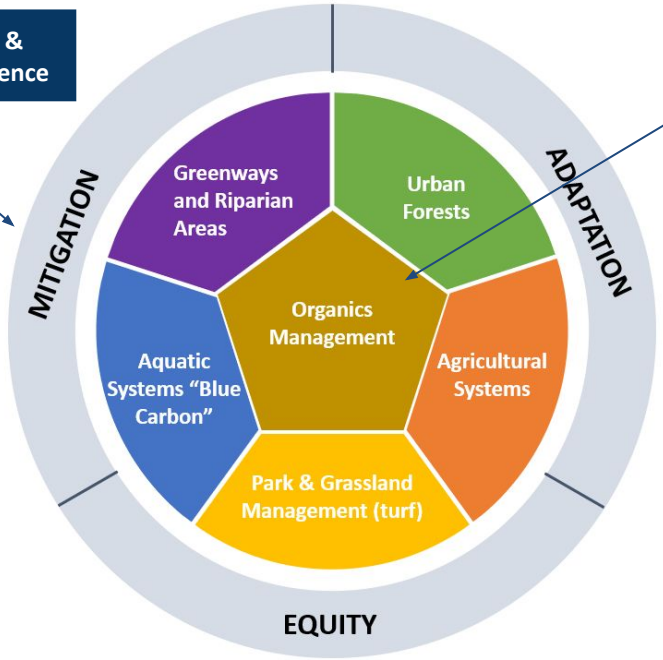
Where Management Systems Meet Climate Action Objectives

This combined framework allows us to examine the **intersections** of climate action and urban landscape management, shown below:

Climate Action Objectives



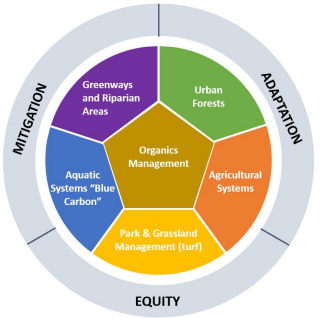
Urban Landscapes and Organic Resource Management Systems



CENTER FOR REGENERATIVE SOLUTIONS

Strategy Development Guide for Climate Action

Phase I: Three Steps



Process Overview

Phase I ***Phase II***

Step 1	***Step 2***	***Step 3***	
Align with Existing Plans	**Opportunity Identification with Stakeholders**	**Conduct Opportunity Assessment**	**Engagement, Implementation, Policy**
Review city plans, documents, and other supporting materials as well as identify key stakeholders to establish key design objectives	Identify opportunity areas within mitigation, adaptation, and equity; align opportunities and objectives among stakeholders with ranking values	Articulate value for landscape management as climate action and analyze opportunity areas across primary design objectives	Conduct stakeholder engagement and feedback; project identification and implementation; integration of policy

CENTER FOR REGENERATIVE SOLUTIONS

How to Navigate this Strategy Development Guide

This strategy development guide is broken down into four sections - an **Introduction, and Steps 1-3 of Phase I**. In each of the steps, you will find **guidance, templates, and examples**.

Guides hyperlinked below:

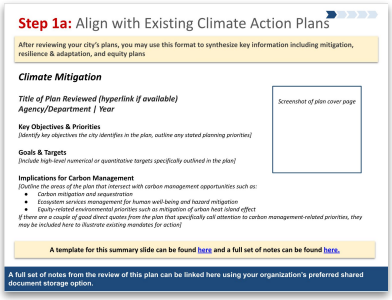
Introduction ← **You are here**

Phase I

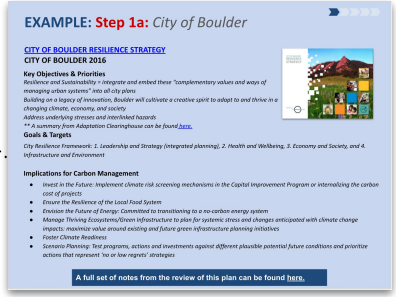
- **Step 1**
- **Step 2**
- **Step 3**

Phase II — *Forthcoming*

Guidance



Templates



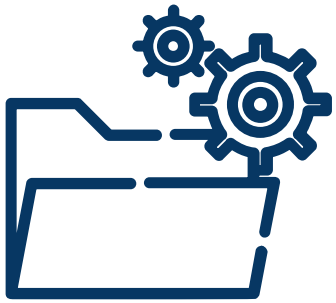
Examples

CENTER FOR REGENERATIVE SOLUTIONS

Download Templates Before Proceeding

This opportunity discovery process relies on the use of tools and tables that you may want to fill in or reference as you go along.

All templates referenced in this guide exist on a Google Sheet for you to access and save. There will also be links to the templates throughout this document.



To work in **Google Drive** (recommended):

Click File -> Make a Copy

To work in **Excel**:

Click File -> Download -> Microsoft Excel (.xlsx)

NOTE:

The Introduction to this guide presents a framework (right) for thinking about ecosystems-based climate action. If you have not reviewed the introduction, we suggest that you take a moment to familiarize yourself with the framework as it will make it easier to follow the pages and instructions that follow.

CENTER FOR REGENERATIVE SOLUTIONS