CHAPTER SIX

Green Stormwater Infrastructure, Water, & Energy

Vision: Green Stormwwater Infrastructure (GSI)

Carrboro routinely prioritizes green infrastructure over grey infrastructure to enhance ecosystems and improve vibrancy, quality of life, and stormwater resiliency in the community.

GREEN STORMWATER INFRASTRUCTURE

Key Findings

1. Protecting terrestrial and aquatic ecosystems, encouraging responsible development, and providing citizens with access to nature are priorities for Carrboro. Green infrastructure refers to the nature-based approaches to realizing these priorities. It includes the intentional means to plan and implement strategies that ensure that native plant communities are created, protected, and restored to thrive. Several initiatives have been recently completed or are underway to improve existing trails and greenways. These include the Jones Creek Greenway, Homestead-CHHS Multi-use path, and Morgan Creek Greenway. Two greenways, Jones Creek and Morgan Creek, are currently being funded in the CIP budget (the CIP budget dedicates $1,987,500—federal monies fund 80% of that amount—to the development of greenways along Jones Creek and Morgan Creek).

2. Green stormwater infrastructure (GSI) is a specific type of green infrastructure that focuses on treating the runoff from developed areas with nature-based practices such as rain gardens, wetlands, bioswales, and other measures that more closely mimic how nature operates (in contrast to more "traditional" grey infrastructure approaches to stormwater management.) Carrboro is actively working on identifying and expanding opportunities to educate and assist residents in implementing green stormwater infrastructure on private properties. In 2020, the Town supported a study that was driven by flood related concerns in the upper Toms Creek watershed and included a recommendation to pilot a green infrastructure-based residential assistance program.

3. Planning for stormwater management is not new to Carrboro and the Town has made progress through prior plans. Past efforts have been incorporated into and emphasized in this plan, including: the Community Climate Action Plan (CCAP), RainReady Carrboro, NDPES Phase II, Bolin Creek Greenway Conceptual Master Plan 2009, and Carrboro: Stormwater Management Plan 2021.

Race & Equity and Climate Action

Race and Equity:

GSI, Water, and Energy strategies and projects have been designed to advance race and equity through:

- Relying on community leadership and participation from all residents, including those with financial barriers or that have historically been excluded from participation.
- Improving water affordability for low-income households.
- Providing technical and financial assistance for stormwater management and infrastructure mitigation projects for low-income households and BIPOC-led businesses.

Climate Action:

GSI, Water, and Energy strategies and projects aim to advance the Town's Climate Action Plan and Energy and Climate Action Plan through:

- Improving tree canopies to reduce heat islands and stormwater runoff and sequester carbon.
- Expanding green infrastructure as part of stormwater, watershed restoration, and climate resilience efforts
- Addressing the effect of development on stormwater management
- Implementing multiple strategies to reduce per capita greenhouse emissions

What We Will Measure

1. Number of households with native plantings

2. Tree canopy coverage

3. Number of residents engaged in the RainReady Initiative

GREEN STORMWATER INFRASTRUCTURE

Goals, Strategies, and Projects

Goal 1: Increase the use of native plants and vegetation to mitigate climate change impacts, assist with stormwater mitigation, and reduce heat island effect.

Strategy 1.1: Rely on community leadership and participation from all residents, including those with financial barriers or those who have historically been excluded from participation.

Marginalized residents are typically on the frontlines of feeling climate change impacts. Work with these residents to understand if and how they are disproportionately impacted by climate change impacts to then understand how to use green infrastructure to improve their quality of life and financial burdens.

A Support the formation of a community-led urban forestry program for the preservation, protection, and conservation of the community forest.

Increase public awareness of the value of trees. Provide oversight for a community scale urban forestry program that seeks to preserve and protect the community forest. Partner with civic groups to improve and expand the Town's tree canopy.

B Increase public education of the benefits of native plants and vegetation for stormwater management.

Educate the public about the difference between turf lawns and native plants in terms of stormwater management. Native plants have deeper roots which can slow down rainwater runoff, reducing stormwater flooding.

C Pursue regulatory and non-regulatory approaches to discourage non-native and invasive plants and encourage native plant use.

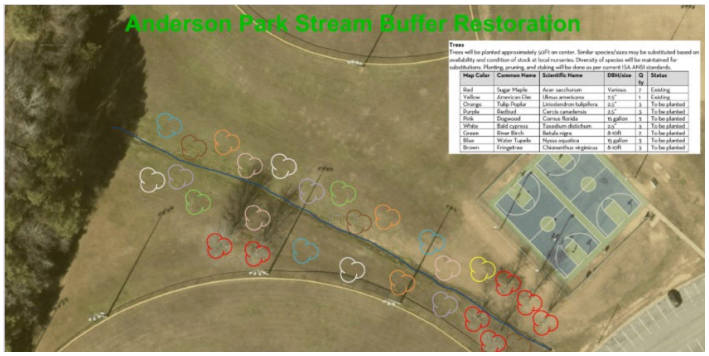
Encourage naturalized landscaping instead of manicured lawns which require less fertilizers and pesticides and can also reduce heat island effect. Look to the Bolin Forest and Quarterpath Trace neighborhoods' initiatives with regard to urban forest stewardship to discourage non-native/invasive plant use.

D Identify opportunities to promote technical assistance and a cost-share grant program to residents seeking to abide by regulatory approaches for encouraging native plant use.

E Identify local resident "champions" who can partner with the Town to support the development of the program and serve as a liaison to residents.

F Identify program design options that provide financial support, enabling low-income residents' participation in a technical assistance and cost-share grant program to install green infrastructure.

G Invest in the completion of a new significant restoration project. Identify priority locations for native plant restoration projects that support continuity of natural spaces, native pollinators, and residents' access to nature.



▲ *Anderson Park Stream Buffer Restoration Project: This Town project has and will continue to host volunteer events to plant trees, create a pollinator habitat, improve water quality, install stormwater control measures, and provide education and outreach to Carrboro residents.*

Goal 2: Plant and maintain the tree canopy along identified roads.
Improving tree canopy along roads can reduce the heat island effect and reduce stormwater runoff on streets.

Strategy 2.1: Improve tree canopy downtown to create a more vibrant and inviting urban landscape, reduce the heat island and stormwater runoff, and sequester carbon.

Tree canopy can entice more people to the street as they can depend on the shade and feel more comfortable.

A Develop and implement a downtown street tree master plan.

Create a baseline for downtown street trees. Develop priority streets with community and stakeholder engagement, incorporating urban heat island data. Allocate budget for installing street planters and culturally and ecologically appropriate trees.

B Make the 2019 "tree tag" outreach an ongoing and regular initiative.

The tree tag project identified trees and shared how each tree provided financial savings, avoided stormwater runoff, saved electricity and energy, and stored carbon dioxide. This initiative is an example of a successful public education campaign and should be expanded.

C Work with downtown businesses and residents to improve the canopy on private lots.

D Seek grant support from the State and other sources to provide financial and technical support. Allocate staff time to research funding opportunities for increasing the tree canopy.

Strategy 2.2: Work with neighborhoods to improve tree canopy and the forest along roads, in neighborhood open spaces, and on private lots.

Tree canopy coverage provides shade for users while reducing the heat island effect and stormwater runoff.

A Support neighborhood efforts to pursue grant funds for neighborhood improvements, especially those with ecological value or related to other town priorities.

B Provide criteria for neighborhood street tree inventories and related master plans.

C Work at a neighborhood scale to "green" the public right-of-way.

D Provide technical assistance for individual residents' improvement and expansion of tree canopy.

Provide workshops, trainings, and a resource center (virtual or physical) to educate residents on how to expand the tree canopy on their own property.

E Seek grant support from the State and other sources to provide local financial and technical support.

Neighborhood Urban Forest Stewardship

The Bolin Forest and Quarterpath Trace neighborhoods, with support from Green Roots Environmental Design, have recently collaborated to pursue a neighborhood-driven forest stewardship campaign. The effort has included invasive plant management, a community workshop at the Century Center, and preparation of a report. The report "presents a holistic approach informed by a synthesis of ecological restoration and urban forestry management strategies." Relatively healthy and mature forest canopy, adjacent large tracts of open land and extensive trail networks all contribute to the value and benefits that the neighborhood enjoys. However, conditions including overgrown areas of invasive species, impervious surfaces and even common landscape management practices contribute to negative impacts such as impaired water quality, soil compaction and limited species diversity. The report highlights current conditions that the community should be aware of, as well as factors that will effect the health of the urban forest in the future.

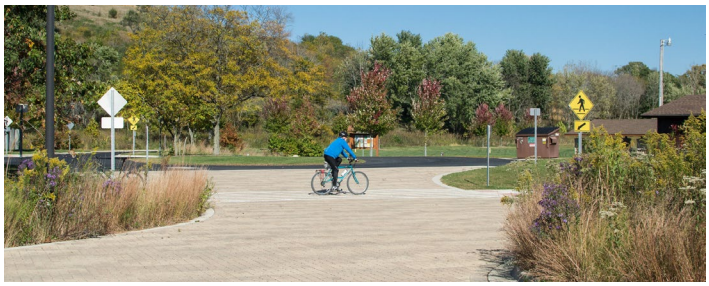
Goal 3: Expand green infrastructure as part of stormwater, watershed restoration, and climate resilience efforts into the Town's public transportation investments.

Strategy 3.1: Coordinate transportation and public infrastructure improvements with green stormwater infrastructure.

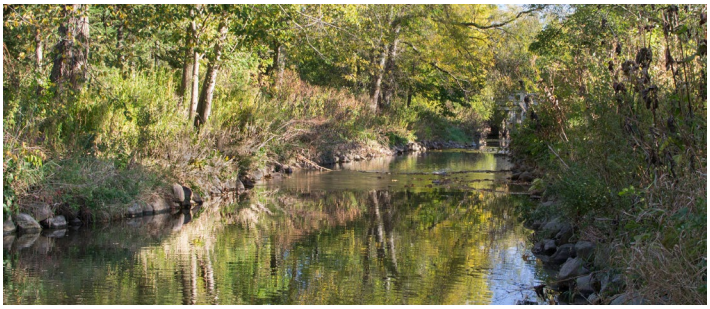
A Integrate green stormwater infrastructure dual solutions that improve stormwater management practices and traffic calming in transportation infrastructure (i.e. streets, alleys, sidewalks, curbs, storm sewers, and greenways).

Example solutions include street planters and permeable pavement which will slow down rainwater runoff. Street planters can be installed in sidewalks or medians and serve as large concrete boxes with soil that allow for plant growth and include gravel for rainwater storage. Permeable pavement creates areas filled with gravel, covered by porous pavement that allows water to travel through.

Permeable pavement



Permeable pavement & bioretention bump-outs



Riparian/stream repair/restoration

B Seek residents' feedback feedback on the incorporation of green infrastructure in new transportation projects.

Always include residents, especially those of BIPOC and other marginalized identities, in the planning of transportation projects to ensure that their mobility needs are accounted for and that they understand the dual benefits of green infrastructure.

C Educate residents about the Town's definition of a greenway and its benefits, and foster discussion about greenways.

Tree planters with stormwater filtration

Impervious removal and disconnection

Goal 4: Expand the use of green stormwater infrastructure to further watershed restoration and meet climate resilience goals.

Strategy 4.1: Expand resources for green stormwater infrastructure to private property owners for greater lot, neighborhood, and watershed scale resilience and environmental quality as well as community enjoyment of outdoor spaces. These efforts should be in conjunction with and in support of the Town's stormwater program and meet state, federal and local regulations.

A Develop programming and accompanying financial assistance for income-eligible households to install green stormwater infrastructure.

Installing green stormwater infrastructure can be expensive. Identify funding and financing opportunities so that all households can participate and install green stormwater infrastructure on their private properties.

B Develop a playbook for stormwater infrastructure retrofits to educate the public.

Identify partner experts who can help develop and deliver typologies of retrofits with the highest likelihood of widespread adoption. Develop a public education campaign to publicize the playbook and lead "how-tos" on implementing retrofits. Provide technical assistance for retrofit projects.

▲ *Example of public education about green stormwater infrastructure at Baldwin Park*

Vision: Water

Pursue a "One Water" vision in which water is managed in a sustainable and inclusive manner to build a better quality of life for everyone and a healthier environment. Align diverse stakeholders to find common ground solutions to the most pressing water challenges. Current and future generations of Carrboro residents, especially BIPOC populations, reliably enjoy affordable access to high quality drinking water, while improving healthy environments and aquatic ecosystems for Carrboro wildlife.

WATER

Key Findings

1. OWASA is continuously working towards maintaining a sustainable water supply, particularly one that is affordable for lower income residents.

2. The Town has been involved in efforts to protect and restore the creeks in Carrboro as well as downstream waters for many years through land use regulations, watershed protection and restoration plans. Additionally, Carrboro has an EPA National Pollutant Discharge and Elimination System (NPDES) stormwater permit that requires the Town to implement and enforce a program to reduce the discharge of pollutants to protect water quality and satisfy requirements of the Clean Water Act.

3. The Town specifically created a Stormwater Utility and Enterprise Fund in 2017 (and increased fees in 2020) to provide dedicated revenue and staff to oversee the Town's stormwater related efforts.

4. Previous water-related efforts and studies have been incorporated into this plan, including: the Community Climate Action Plan (CCAP), RainReady Carrboro, Little Creek Watershed Assessment, Morgan Creek Local Watershed Plan, Bolin Creek Watershed Restoration Plan, 2012; Facilitated Small Area Plan 1999, Morgan Creek Local Watershed Plan 2004, Carrboro: Illicit Discharge Detection and Elimination Program 2020, OWASA Long Range Water Supply Plan 2013.

What We Will Measure

1. **Number of businesses, HOAs, and other organizations actively engaged in watershed restoration, stormwater management, and water based public health endeavors**
2. **Amount of funding for watershed restoration and stormwater management projects every 2-4 years**

WATER

Goals, Strategies, and Projects

Goal 1: Ensure that Carrboro residents are informed of and engaged with OWASA's water supply, quality, and cost plans.

Strategy 1.1: Coordinate with OWASA and others for the maintenance and improvement of water supplies (i.e. Jordan Lake Watershed and University Lake).

OWASA is responsible for the maintenance and quality of water (drinking and wastewater) that Carrboro residents depend on. The main way that the Town of Carrboro can assist OWASA is by enforcing and improving land use protections for the University Lake and the Jordan Lake watersheds, including but not limited to impervious surface limits and water

A Identify resident concerns, especially those of marginalized identities, related to water and share this input with OWASA.

Create a clear line of communication so that residents can share issues with the Town about water affordability, quality, and supply issues. The Town can share these concerns with OWASA and support work to address these issues.

B Encourage OWASA to explore affordable water rates targeted to lower-income households.

OWASA currently sets water rates based on a typical household usage at a base rate, and charges higher rates for greater use. This can still put a high burden on low- and moderate-income residents. OWASA also offers the Care to Share program which is a partnership between OWASA and the Inter-Faith Council for Social Service. All funds donated to Care to Share go directly to providing bill assistance. According to OWASA, while North Carolina law does not allow utilities to offer discounted rates or debt forgiveness for those who cannot pay their water bill, residents have expressed the need for OWASA to explore innovative approaches to ensure that water is not turned off due to households' inability to afford their water bills.

C Work with OWASA to communicate goals and projects to residents in culturally responsive ways.

Carrboro can provide guidance to OWASA on how to best communicate to Carrboro residents so that everyone is fully informed. This is particularly important for water efficiency measures which can help reduce financial burden on low-income households and address residents' concerns of drought.

OWASA is responsible for the maintenance and quality of water (drinking and wastewater) that Carrboro residents depend on. The Town can assist OWASA through enforcing and improving land use protections for the University Lake and the Jordan Lake watersheds, including but not limited to impervious surface limits and water quality and buffer regulations. OWASA's Treatment Facility is located in the heart of Carrboro, off Jones Ferry Road.

Goal 2: Protect and restore watersheds and ecosystems.

Due to development, the aquatic health of many of creeks and riparian areas in and around Carrboro have been compromised through pollution, habitat degradation, changes in hydrology, and other stressors. Further investment and protection of these ecosystems is needed to ensure the health of all species living in and dependent on local creeks, people's access to water, and to improve resilience to climate change.

Strategy 2.1: Continue to implement watershed management and restoration projects.

Stormwater runoff can degrade water quality due to the pollution runoff picks up as it moves from urbanized and polluted spaces to water bodies. By managing stormwater, the pollution to aquatic ecosystems can be reduced.

A Seek additional funding to continue to expand the Stormwater Utility's and Enterprise fund efforts to implement stormwater/bioengineering methods and retrofits.

Identify high priority projects and allocate sufficient budget and staff time to such projects. Priority projects should be identified via data-driven methods and contribute to improvement for the whole watershed, not be isolated to one section. Include equity components to increase access to clean and healthy water bodies for stormwater burdened households, low-income households, and BIPOC households.

Retrofit projects can scale from lot-level stormwater management to larger regional treatment facilities. Successful retrofitting requires available space for structure and maintenance, permission from owners, funding for engineering design and initial construction, regular maintenance, a designated entity responsible for maintenance and repairs, and a method to enforce maintenance after construction.

"Provide more publicity and outreach to expand existing volunteer waterway cleanups" – *Task Force idea*

B Implement incentive programs for stormwater management or infrastructure mitigation projects for local businesses, prioritizing those that are BIPOC-led, and develop technical and financial assistance for income-eligible households to participate.

Create job opportunities for BIPOC-led businesses for stormwater management projects to support Carrboro's business enterprise goals. Provide programmatic support to help BIPOC businesses bid competitively to other businesses.

C Research and develop additional and innovative pollution prevention and cleanup, and hillslope, conveyance and channel erosion control practices that build upon current practices to best serve the various ecosystems in Carrboro.

Work with other agencies and consultants or academics to implement strategies to understand pollution prevention, cleanup, and erosion control practices specific to the ecosystems of Carrboro. Prioritize which practices to implement based on budget, impacts on the ecosystem, and carefully consider any impacts on historically marginalized residents of Carrboro.

▲ *Carrboro is committed to investing in and protecting all bodies of water and ensuring the health of these ecosystems and all the species that rely on them. Pictured here is University Lake, seen from Jones Ferry Road.*

D Continue to administer procedures for detecting and removing illicit discharge sources.

Regularly review and revise the town's Illicit Discharge Detection and Elimination program, maintain a current map of the stormwater system, annually maintain and evaluate written procedures for identifying illicit discharges, train staff appropriately, educate the public, publicize how community members can report illicit discharges, and track violations.

E Continue to expand educational efforts on green infrastructure and pollution prevention best practices, as well as hazards of illegal discharge.

The recently released and well-received Stormwater and Watershed Homeowners Manual is an example of a helpful educational resource.

Some residents and business owners in Carrboro may use harmful chemicals to manage their landscapes or improve the look of their lawns or gardens. These chemicals pose a danger to water bodies, for example, through eutrophication which robs the water of oxygen, or being acutely or chronically toxic to aquatic organisms. Continue to expand education about more eco-friendly landscape and garden care to reduce these impacts.

Work with resident groups to help spread information about hazards of illegal discharge. Continue to partner with Chapel Hill's stormwater education program or UNC to develop content for the educational campaign.

F Limit disturbance of riparian areas while maintaining sanitary sewer infrastructure and greenways.

Work with OWASA and other utilities to identify disturbed riparian areas near infrastructure. Riparian areas refer to terrestrial land in the transition between uplands and aquatic ecosystems. Limit any future disturbance to the maximum extent and reestablish native vegetation when possible.

Goal 3: Reduce the amount of Carrboro's treated water use while increasing water rate affordability.

Reducing treated water use can reduce water costs because less energy and facility use is required when less water is treated, saving expenditures.

Strategy 3.1: Promote water conservation and efficiency efforts among residents and businesses.

Support water conservation and water efficiency efforts among people living and working in Carrboro, not only focused on municipal water use.

A Develop programs to educate residents and business owners about local water supply and stewardship programs.

Work with OWASA to support communications on water stewardship programs to residents and business owners. Ensure that education is culturally responsive so that all residents and business owners can understand messaging.

B Provide financial and technical assistance to income-eligible residents and business owners to install water conservation and efficiency measures.

Partner with OWASA to support water conservation and efficiency programs that reduce cost and technical burden for residents and business owners. Engage community members to support development and implementation of programs to make sure that they are effective and useful for residents.

C Establish water efficiency standards for new developments and encourage retrofits to older developments.

Setting water efficiency standards will force developers to build more water efficient buildings. For retrofits, develop a program to help fund retrofits and determine which entity is responsible for retrofits. Work with OWASA to provide technical assistance for these retrofits.

D Develop policies to expand safe use of reclaimed water.

Reclaimed water is reusing wastewater for other purposes prior to treatment (for example, irrigating gardens with safe wastewater). Identify policies that are barriers to reclaimed wastewater use and advocate for new policies. Support public education around reclaimed water use.

E Initiate water use audits, repairs, and retrofits in government buildings.

Improve municipal water efficiency by first auditing water use to determine a baseline and then budget for and implement water infrastructure repairs and retrofits to reduce water use.

F Pilot demonstration of water conservation and efficiency projects at public facilities.

To encourage private water conservation and efficiency projects, use a public facility as a demonstration project. Educate community members about the projects, highlighting how it works and the water and cost savings.

G Assess what level water rates must be set at to improve affordability for low-income residents and advocate to OWASA to set affordable rates.

Advocate to OWASA to look at water bill payment data and understand payment trends looking at both qualitative and quantitative data. Facilitate meetings between OWASA and community members to ensure culturally responsive logistics and content. Use meetings to understand how affordability can be improved.

Strategy 3.2 Address the effect of development on stormwater management.

Impervious surfaces due to development reduce the opportunity for water to infiltrate soil, meaning that instead water runs off and leads to stormwater issues.

A Implement structural and non-structural management measures for redevelopment and infill and add retrofits in dense locations to increase stormwater volume control.

Non-structural management measures cluster and concentrate development, minimize disturbed and impervious areas, reduce runoff, preserve open space, protect natural systems, and incorporate existing landscape features such as wetlands and riparian corridors into site plans. Structural management measures are engineered technologies to store, infiltrate, and evapotranspire runoff and that prevent pollution from entering stormwater runoff.

B Incentivize Low Impact Development practices for any new developments that reduce impervious surfaces and mimic natural hydrology.

Low impact development practices use nature-based solutions (like green stormwater infrastructure) to manage stormwater with infiltration and evapotranspiration.

C Stabilize vegetation in new construction beyond the minimum erosion control requirements.

To stabilize vegetation means to maintain existing vegetation at construction sites. This can help prevent erosion during precipitation events because the roots of vegetation keep soils intact. Current minimum erosion control requirements will likely be insufficient as climate change impacts increase. Carrboro can strengthen vegetation stabilization requirements as part of approval of construction permits.

▲ *One of the ways Carrboro can continue improving water quality is by pursuing stream restoration, enhancing stormwater runoff management projects.*

Vision: Energy

Carrboro reduces its dependence on fossil fuel energy sources with opportunities for all residents, especially low-income BIPOC residents, to participate.

ENERGY

Key Findings

1. Carrboro is working towards their energy goals of reaching 80% reduction of emissions by 2030 when compared to 2010 levels.

2. The Town wants to be responsive of social justice while working towards energy goals by addressing the energy burden on low-income households.

3. Energy reduction efforts are already underway, guided by the Community Climate Action Plan (CCAP) and the Energy and Climate Protection Plan (ECPP) 2014.

What We Will Measure

1. **Levels of greenhouse gas emissions per capita**
2. **Town and community use of renewable energy**

ENERGY

Goals, Strategies, and Projects

Goal 1: Achieve 80% reduction 2010 levels of per capita greenhouse emissions by 2030.

This goal was updated in Carrboro's Community Climate Action Plan in October 2020; the previously adopted goal was 50% reduction in greenhouse gas emissions by 2025. The goal refers to community-wide greenhouse gas emissions, not only emissions due to municipal operations.

Strategy 1.1: Reduce greenhouse gas emissions from motor automobile use by 80% by 2030.

Transportation is a significant source of greenhouse gas emissions. Automobiles that use gasoline emit greenhouse gasses because the energy source comes from fossil fuels which are rich in carbon. The same is true of electric vehicles (EVs) unless the electricity to charge EVs is created from renewable energy. Increased density and infrastructure around mixed-use residential and commercial areas and alternatives to single-occupancy vehicle travel can reduce community emissions due to transportation. Mixed-use areas and transportation options must be widely accessible, affordable, and meet a variety of household needs and preferences.

A Refer to Transportation project 2.1.a

B Provide a variety of public transit options (buses, small buses, vans, etc.) and increase opportunities for alternatively fueled vehicles. Relatedly, improve vanpool and carpool options for commuters and seek funding opportunities from the Triangle Transportation Demand Management (TDM) Program.

The Triangle TDM Program provides funding opportunities for alternatives to automobile use. Staff should allocate time to understand these opportunities and align them to community desires for a variety of public transit options. A variety of public transit options may help extend service hours while managing concerns of empty buses.

C Support adoption of electric vehicles by requiring EV charging stations, infrastructure, and reserved spaces at popular destinations and expanding charging options outdoors and at rental properties.

As of June 8, 2021, the LUO requires EV charging stations in new developments. Assess where EV charging stations would benefit drivers without displacing current residents from their homes by triggering gentrification. Popular destinations may include downtown Carrboro or recreational locations. Including EV charging stations in new developments (owner- and renter-occupied) can entice environmentally friendly households to reside there. Evaluate car-sharing electric vehicle programs so that those who cannot afford their own vehicle can make use of charging infrastructure as well.

Strategy 1.2: Reduce community greenhouse emissions attributed to Carrboro buildings by 80% from 2010 levels by 2030.

Improve energy efficiency of buildings to reduce emissions related to energy use.

A Continue conducting building energy assessments and ratings for all municipal buildings and inventory energy efficiency measures throughout the town.

The Town worked with a consultant to establish a baseline of building energy use and develop a rating system to prioritize buildings for energy efficiency projects. Town Hall and the Century Center are the first two buildings.

B Increase energy efficiency within municipal buildings with technologies used in weatherization efforts.

Identify and budget for weatherization best practices – such as those related to insulation, window fixtures, etc. Opportunities should be determined using the information learned from the building energy assessment.

C Address limitations to financing energy efficiency for low-income households and renters by creating and administratively supporting a Rental Environmental Task Force including owners and renters.

The Town can partner with a community organization to develop and facilitate a task force comprised of compensated stakeholders, tasked with identifying strategies to increase participation of rental properties in energy efficiency projects. Conduct community engagement to develop a program that best serves low-income, renter households. Budget for annual costs needed to implement energy efficiency projects.

D Support energy efficiency financing for small businesses and low-income households through the Energy Efficiency Revolving Loan Fund and clean energy financing for commercial properties.

Conduct evaluation of the Energy Efficiency Revolving Loan Fund program to identify best practices, understand previous program participants' experiences and opinions, and explore changes that would allow greater flexibility and more categories of uses (solar and geothermal). Speak with current business owners that have yet to participate to understand what improvements would benefit potential future participants. Budget for annual amount to implement energy efficiency projects.

The town of Carrboro is currently part of the North Carolina Cities Initiative in coalition with several other municipalities. One of 12 action items include reducing barriers for commercial properties to access clean energy by adding a lien and paying off installments through property bills. Co-create how to address barriers for small business owners to ensure that the program is feasible for those with less capital or concerns with liens.

E Host renewable energy sites in the business district, among clustered commercial buildings or Town buildings.

Determine barriers to publicly owned renewable energy sites and advocate for policy changes. Identify locations for renewable energy sites among clustered buildings. Educate the public to increase awareness of renewable energy.

F Develop a Community Energy Dashboard, using building energy assessment data, to identify progression or regression from the Town's energy goal over time.

Using the building energy assessments, develop a dashboard that is publicly viewable to show how building energy consumption is supporting or moving away from Town energy goals. Regularly update the dashboard for accurate counts.

G Create a utility billing platform to help energy customers (individual households, commercial building owners, and municipalities) understand their energy use.

The Town of Carrboro is currently part of the North Carolina Cities Initiative. One of the agreed upon action items is to create a utility billing platform in partnership with Duke Energy which would be funded through on-bill financing. In the creation, it is imperative that the financing mechanism considers impact on low-income households to ensure that additional billing does not create an energy cost burden.

H Create policies that incentivize net-zero construction, building electrification, and other energy efficient retrofits in new and existing developments, prioritizing affordable housing developments.

Carrboro is part of the North Carolina Cities Initiative through which the town can conduct research and understand net-zero building stretch codes and advocate for such legislation at the state level. Add net-zero provisions or suggestions (if provisions are not legally allowed) to building permits and educate developers and landowners. Provide technical assistance on net-zero retrofit construction projects. Prioritize affordable housing development in which residents are energy-burdened (paying a high proportion of their income on energy). Look for ways to develop new building standards and incentives to use electric rather than gas (Ithaca, New York's program is a potential model for building electrification).

I Explore options to increase renewable energy usage through Renewable Energy Credits (RECs) purchases or advocating reinstatement of state solar tax credits. Advocate with a coalition of other jurisdictions for reinstatement of state solar tax credits. Purchase additional RECs and advocate against policy barriers to purchasing more RECs.

▲ *Example of distributed renewable energy (solar panels). Identify opportunities to increase municipal or community-based solar projects (ECPP), including funding to allow participation at a variety of income levels.*

Strategy 1.3: Increase Carrboro's use of renewable energy.

Increasing renewable energy use – solar or geothermal are best fits for Carrboro – to reduce greenhouse gas emissions.

A Develop a renewable energy portfolio that takes advantage of federal and state tax credits and supports increased solarization.

Work with Duke Energy to increase renewable energies in the portfolio. Research additional solar energy for the portfolio for procurement. Allocate staff time to identify federal and state tax credits to incentivize renewable energy procurement.

B Advocate for state legislation that enables Carrboro to invest in renewable energy generation projects that allows shared solar investment benefits in the community or can generate revenue to be invested in community needs, like affordable housing.

Advocate at the State level to streamline community solar facility requirements for utilities and other enabling policies that allow access to solar energy for residents who aren't able to install rooftop solar. Research opportunities and best practices for generating revenue from community solar and allocate these revenues to support affordable housing projects in town.

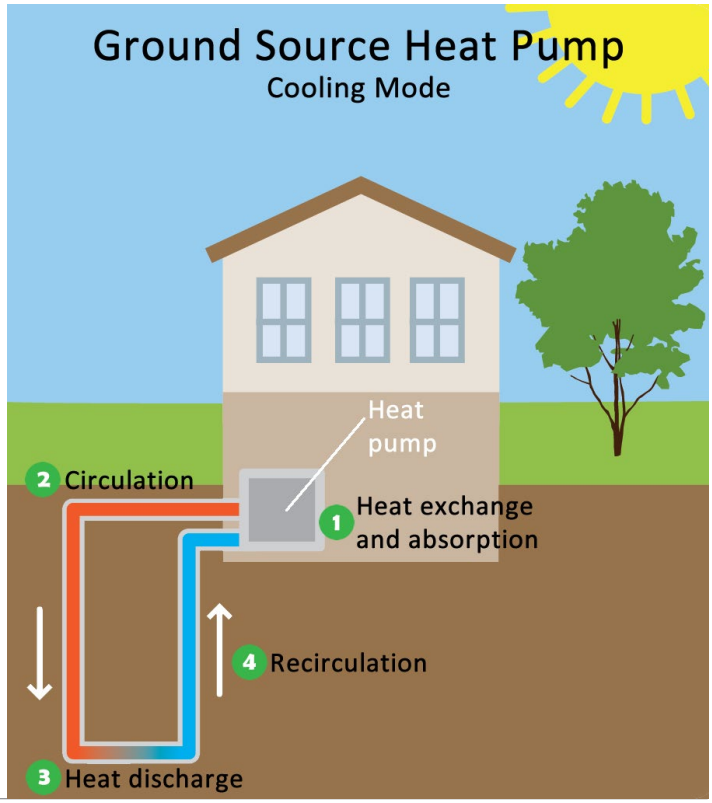
C Develop programs and policies to support homeowners' ability to generate solar energy on roofs, with consideration for low-income homeowners.

Assess the limitations to homeowners' generating solar energy. Develop financial and technical assistance programs to ease adoption of roof solar energy for low-income homeowners. Finance ideas can include grant base programs, low-cost financing, or on-bill financing – but should be determined with low-income homeowners in program development.

Example of distributed renewable energy (solar panels) Identify opportunities to increase municipal or community-based solar projects (ECPP), including funding to allow participation at a variety of income levels.

D Investigate opportunities to pursue geothermal installations.

The Town could pursue a municipal project on Town-owned land along Morgan Creek. Additionally, staff can identify ways to incentivize installations.



A Geothermal heating and cooling system (Source: EPA). ▶

Related Strategies & Projects in Other Chapters

Transportation & Mobility

- Provide a variety of public transit options (buses, small buses, vans, etc) and increase opportunities for alternatively fueled vehicles
- Support adoption of electric vehicles by requiring EV charging stations, infrastructure, and spaces at popular destinations.
- Coordinate transportation and public infrastructure improvements with stormwater green infrastructure.

Climate Action & Environment

- Increase Carrboro's use of renewable energy
- Support energy efficiency financing for small businesses and low-income households through the Energy Efficiency Revolving Loan Fund and clean energy financing for commercial properties.
- Provide financial and technical assistance to income-eligible residents and business owners to install water conservation and efficiency measures
- Increase public education of the benefits of native plants and vegetation for stormwater management.
- Identify opportunities to promote technical assistance and cost-share grant program to residents seeking to abide by regulatory approaches for encouraging native plant use.
- Invest in the completion of a new significant restoration project.
- Improve canopy downtown to create a more vibrant and inviting urban landscape, reduce the heat island and stormwater runoff, and sequester carbon.
- Continue to implement watershed management and restoration projects.
- Address the effect of development on stormwater management.

Affordable Housing

- Create policies that incentivize net-zero construction and energy efficient retrofits in new and existing developments, prioritizing affordable housing developments.

Public Services

- Continue conducting building energy assessments and ratings for all municipal buildings and inventory energy efficiency measures throughout the town.