City of Winston-Salem

North Carolina Sustainability Benchmarking Report

2022-2023

Thank you to the staff from the following municipalities who participated in the data collection process:

Town of Apex
City of Asheville
Town of Boone
Buncombe County
Town of Carrboro
Town of Cary
Town of Chapel Hill
City of Charlotte
Chatham County
Town of Davidson
Durham County
City of Durham
Forsyth County
City of Greensboro
Town of Hillsborough
Town of Holly Springs
Mecklenburg County
Town of Morrisville
Orange County
City of Raleigh
Town of Salisbury
Wake County
Town of Wake Forest
City of Wilmington

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Glossary Terms

Alternative Fuel Corridor (AFC)	A national network of plug-in electric vehicles (EV) charging and hydrogen, propane, and natural gas fueling infrastructure along national highway system corridors.
Cities Initiative	A collaborative effort among North Carolina local governments that are working to reduce their greenhouse gas emissions. The non-profit Environmental Defense Fund (EDF) is leading this initiative.
Clean Energy	Energy produced from renewable sources that produce zero emissions. This includes nuclear along with other renewable energy sources.
DC Fast Charger (DCFC)	The fastest charging station option with the ability to charge 80% of the EV battery in less than 20 minutes for most cars; they convert AC power, alternating current, to DC power, or direct current, within the charging station and then deliver that DC power to the vehicle battery; most suitable at commercial and industrial locations
EnergyStar	The government-backed symbol for energy efficiency, providing simple, credible, and unbiased information that consumers and businesses rely on to make well-informed decisions. ENERGY STAR also provides their Portfolio Manager tool for local governments to manage greenhouse gas inventories.
EVSE	Electric Vehicle Supply Equipment; [Devices that] provide electric power to the vehicle and use that to recharge the vehicle's batteries. EVSE systems include the electrical conductors, related equipment, software, and communications protocols that deliver energy efficiently and safely to the vehicle.
Geothermal Energy	Geothermal energy is a renewable energy source that comes from the heat naturally occurring from within the earth
ICE Vehicle	Internal combustion engine vehicles; traditional gas or diesel powered vehicles
LEED	Leadership in Energy and Environmental Design; the most widely used green building rating system in the world. LEED provides a framework for healthy, efficient, carbon and cost-saving green buildings and now for cities and communities.
Level 2 Charging Station	These stations utilize AC power, alternating current, to charge vehicle batteries, which is why they are slower to charge a vehicle compared to the DCFC option charging 18-28 miles of range per hour. These are the most common EV chargers due to their suitability for a variety of locations.
National Electric Vehicle Infrastructure (NEVI) Program	A program established by the Bipartisan Infrastructure Law to provide $5 billion from July 2022-Jun 2027 to help states create a network of 500,000 electric vehicle charging stations along designated AFCs. North Carolina is expected to receive $109 million to build out EVSE along the state AFCs.

North Carolina Sustainable Energy Association (NCSEA)	A non-profit advocacy organization that works to enable clean energy jobs, economic opportunities, and affordable energy options for North Carolinians.
Renewable Energy	Energy produced from sources that are naturally replenished and do not run out. Sources include solar, wind, geothermal, hydrogen, hydropower, and bioenergy.
Right-Sizing	A practice that helps fleet managers build and maintain an ideal vehicle inventory. It involves evaluating fleet size and composition to optimize vehicle use, conserve fuel, reduce emissions, and save money.
Solar Photovoltaic (PV)	This is the technology used in solar panels that absorb sunlight and then convert it into electrical energy. A solar PV system is one that is made up of panels either on a roof system or ground-mounted system.
Solar Ready	The practice of building new facilities or upgrading facilities for the future installation of a solar PV system. This practice is utilized to save money upfront during the initial construction project.
Solarize Campaign	A community-based group-purchasing program for solar energy, battery storage, and other clean energy technologies that helps homeowners, businesses and nonprofits become more resilient, reduce energy expenses, and save on the cost of renewable energy systems by obtaining volume discounts on materials and installation services — the more that participate, the greater the savings.
SolSmart	A national designation program designed to recognize communities that have taken key steps to address local barriers to solar energy and foster the growth of mature local solar markets; communities can be recognized as SolSmart Bronze, Silver or Gold designation.
Southeast Sustainability Director's Network (SSDN)	A network of local government sustainability professionals from cities and counties in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Virginia. The network connects members to accelerate, scale and implement sustainable best practices so that communities are equipped to adapt to and mitigate climate change.
Waste Diversion/Characterization Study	Reports that analyze the sources of municipal solid waste generated within a jurisdiction, including the types of waste and sectors the waste comes from. The Diversion Study also includes information about where and which facilities the waste is disposed of.

I. Introduction

The City of Winston-Salem Office of Sustainability has created a benchmarking report of sustainability work in municipalities across the state. This report informs of best practices, policies, and strategies for implementation across topics such as energy efficiency, renewable energy, and public and internal electric vehicles and related infrastructure.

The report highlights work from North Carolina municipalities participating in the Cities Initiative group or the Southeast Sustainability Director's Network (SSDN). These groups have effectively brought together sustainability practitioners in local governments who are leading this work at the local level, which allows for increased accessibility between staff across the state. However, these are likely just some of the municipalities in the state working on sustainability, especially as the sustainability field continues to grow. These municipalities may also have completed or planned projects, programs, and other efforts beyond what this report includes.

City of Winston-Salem staff created a survey of twelve questions, found in Appendix A, and sent it to twenty-four municipalities to gather data. The information analyzed from the surveys reflects the progress of the municipalities as of the 2022-2023 fiscal year. The survey had a 100% response rate.

The following report will summarize the municipalities' goals, policies, and implementation strategies to identify the best practices and leaders in various sustainability efforts. The sections will look at electric and alternative fuel vehicles at both fleet level and public access, greenhouse gas emissions through energy efficiency and renewable energy work, and additional projects municipalities mentioned as significant to local sustainability efforts.

II. Background

This report considers eighteen cities or towns and seven counties across the state, including Winston-Salem. A population breakdown in Figure 1 provides insight into the variety of communities included in the report. The smallest city by population in this analysis is Hillsborough, with a population of 9,660,

Figure 1. Size of Municipality

and the largest is Charlotte, with a population of 874,579. The smallest county by population is Chatham County at 76,285 and the largest is Wake County at 1,129,410 residents. The graphs are labeled to highlight where Winston-Salem falls within each category.

Figures 2 and 3 note the organizational structure of each community, including which department sustainability staff are in and how many dedicated sustainability staff work in their local governments, respectively. The most common department in which to find local government sustainability staff is the Public Works/General Services department. In counties, it is common for sustainability to be in a general Environmental Services department. The number of staff dedicated to sustainability work varies from eleven governments with one staff member to two local governments with five staff. On average, there are two people per organization working on these efforts. Appendix B contains additional details as to specific departments and staff sizes.

Figure 2. Organizational Structure

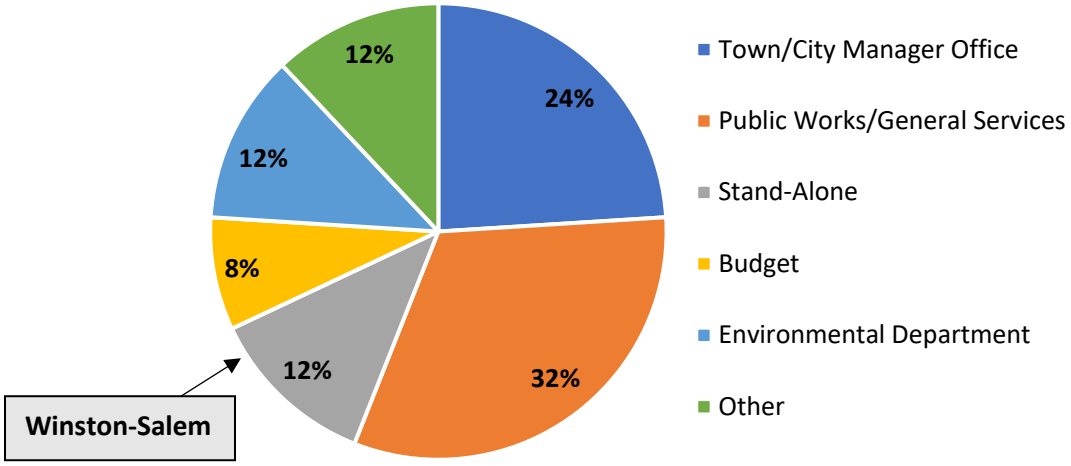
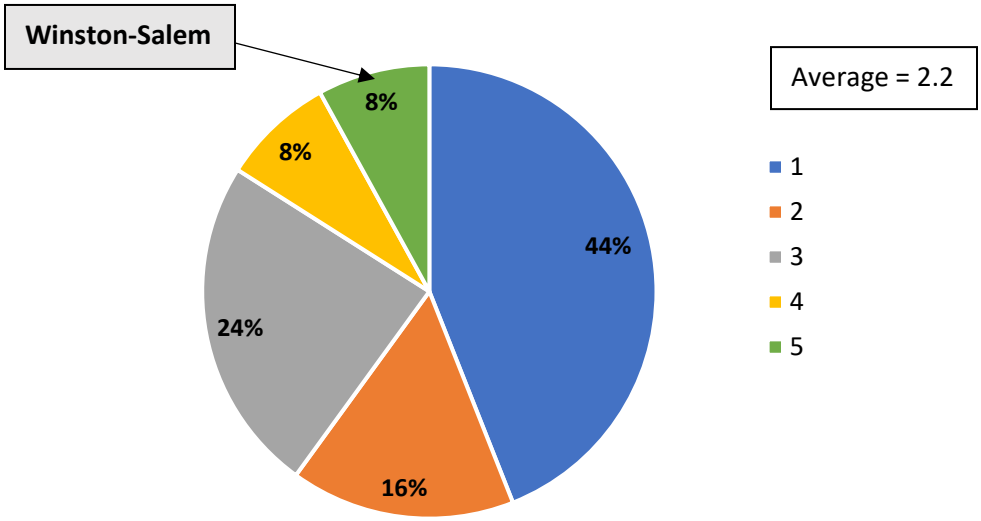
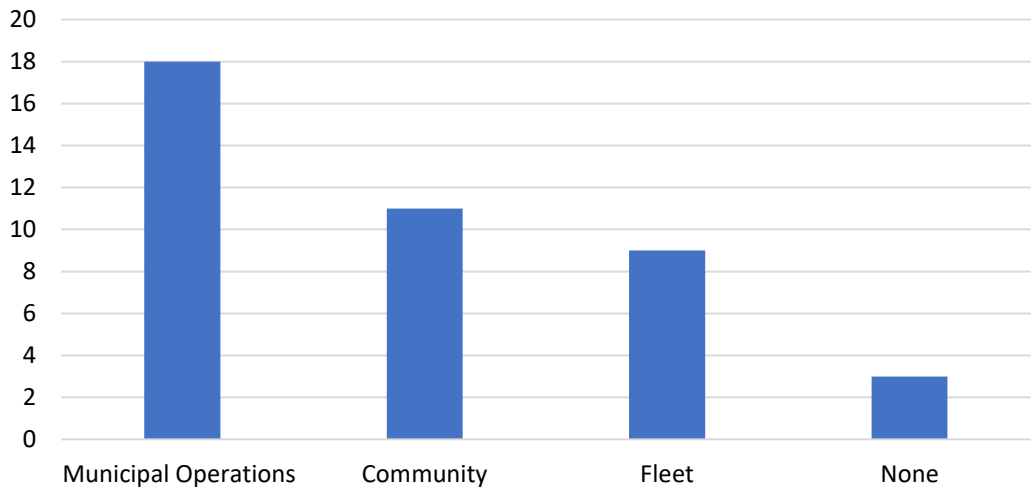


Figure 3. Number of Staff Positions for Sustainability



Almost all municipalities in this report have established sustainability goals, with a breakdown of the scale of those goals included in Figure 4. It is most common for municipalities to develop a local government operational goal as this scope falls within the decision-making control of a municipality. Fewer municipalities have community and fleet goals, though more cities are establishing fleet goals. Winston-Salem has goals at the municipal operations and fleet levels. Appendix C includes the goals that the municipalities in this report have set at all scales.

Figure 4. Scale of Sustainability Goals



2.1 Capacity Building

A noticeable trend of increasing staff capacity points to the growing focus and importance of sustainability across the state. Since the start of 2022, at least nine municipalities have hired new sustainability staff. Three municipalities (Holly Springs, Greensboro, and Salisbury) hired their first full-time dedicated sustainability staff while the others hired additional staff members. Prior to 2022, the average number of local government sustainability staff in North Carolina was 1.88, which has since grown to an average of 2.2, as seen in Figure 3 above.

2.2 How Winston-Salem Compares

When considering staff size, the recycling collection staff from the City of Winston-Salem was not included in this analysis. This was done because, with nineteen total staff, the Winston-Salem Office of Sustainability (WSOS) is an outlier as the largest department by more than three times the size of the next largest staffing cohort. Additionally, the Winston-Salem recycling crew was removed from the sustainability staff count because, based on the responses, oversight of the local recycling program is a unique responsibility of the WSOS. The extent that other sustainability staff is involved in recycling or solid waste generally seems to be limited to education and outreach efforts, so the WSOS Recycling Coordinator remains included in the staff count of the department. Even without including the fourteen recycling staff, Winston-Salem and Raleigh have the two largest offices in the state with five dedicated staff members.

III. Electric and Alternative Fuel Vehicles

The transportation sector is consistently responsible for significant greenhouse gas emissions in the state. As a result, it is essential to mitigate this sector to further reduce emissions, so it is common for

sustainability efforts to include electric and alternative fuel vehicle projects for government operations and public access.

At the state level, the Governor Cooper administration has set numerous goals addressing transportation through various executive orders. The latest executive order requests the NC Department of Environmental Quality establish a state Advanced Clean Trucks program to target emissions reductions specifically for medium- and heavy-duty vehicles with the rule proposal due no later than May 15, 2023[1]. By 2025, it is a goal to have the number of registered zero-emission vehicles (ZEVs) reach 80,000[2], and reach 1,250,000 with 50% of in-state sales of new vehicles being ZEV by 2030[3].

The Federal Highway Administration has also identified Alternative Fuel Corridors (AFCs) for EVSE prioritization nationwide. The AFCs recognize highway segments with existing or planned infrastructure to support alternative fuel vehicles. In North Carolina, these corridors include I-40, I-85, I-77, I-95, I-26, 485, 495, and 140. In Winston-Salem, there is only one AFC, the portion of I-40/I-85 that runs south of the city. These corridors are instrumental in the state's National Electric Vehicle Infrastructure (NEVI) plan, which the state will prioritize for future projects.

3.1 Municipal Fleets

A growing focus for municipalities across the country is an increase in purchases of alternative fuel or non-internal combustion engine vehicles for fleets. Many jurisdictions have alternative fuel fleet goals that drive these alternative fuel purchases, as well as increased funding opportunities through tax credit incentives and grant programs soon to be available at the state and federal level through the NEVI plan and the Inflation Reduction Act. While many municipalities are increasing alternative fuel and zero emission vehicles (ZEVs) for fleets, no cities are purchasing 100% ZEVs. The earliest deadline set for reaching a 100% zero carbon fleet is 2030, a goal set by the City of Charlotte. Mecklenburg County has the next closest deadline with a net zero carbon fleet goal by 2035. The seven other municipalities with a fleet goal, including Winston-Salem, have a 100% zero carbon or electric fleet by 2050 goal in place.

In recent years, the availability of alternative fuel vehicles has decreased as demand has increased, extending wait times from seven months to a year to receive vehicles after placing an order. This issue will likely continue with these increased funding opportunities related to electric vehicles.

It is also important to note that while almost all municipalities are pursuing alternative fuel vehicles, implementation progress varies. Some municipalities are working to acquire their first fleet EVs, some are pursuing hybrids and other alternative fuel vehicles, and others approaching electrification more holistically. On average, North Carolina municipalities have eleven total EVs in their fleets. However, considering Charlotte will have over 100 by the end of FY22-23, it is also reasonable to highlight that the average excluding their fleet is between six and seven total EVs since their fleet is a clear outlier. The calculations include electric buses but exclude electric equipment. While Winston-Salem currently has two EVs, there are plans to purchase four additional EVs through the Energy Efficiency and Conservation Block Grant program, and more general plans to pursue more purchases as resources or planning allows.

3.1.1 Policies

One approach to drive alternative fuel vehicle purchases is to establish a version of a green fleet purchasing policy, whether formal and informal. A common policy practice is to evaluate vehicle purchase requests on a tiered basis. Buncombe County summarizes this approach well in their policy

[1] Executive Order 271, 2022
[2] Executive Order 80, 2018
[3] Executive Order 246, 2022

which determines vehicle replacement based on the lowest emission vehicle available that still meets business needs when a vehicle replacement comes up. Another way to explain this approach is by considering EVs first for a vehicle replacement. If that option is unavailable or not suitable, staff will consider a hybrid replacement. If there is not a suitable EV, plug-in, or hybrid replacement option, staff select the next most efficient option. At the time of this report, six municipalities reported having some form of a sustainable fleet purchasing policy or system in place reviewing fleet replacement requests, with four more reporting upcoming policies.

LEADER

Buncombe County has established a sustainable fleet policy to guide their municipal fleet purchases to increase EV and alternative fuel vehicles. The policy includes a goal to reach a zero emission fleet "in the most expeditious and financially responsible manner possible" and guidance to purchase the most efficient vehicle for all new and replacement vehicles, demonstrating policy leadership for a municipal fleet.

3.1.2 Implementation Strategy

The policies described above, and established fleet goals help ensure consistent implementation of alternative fuel vehicle purchases.

Municipalities are also implementing electrification for equipment other than vehicles. Several municipalities are testing electric landscaping equipment such as mowers, blowers, and weed whackers. There are also municipalities pursuing larger electric equipment such as bucket trucks, street sweepers, utility terrain vehicles, and utility carts. As technology improves, a newer trend is the pursuit of electric garbage trucks. Some municipalities, such as Cary, Chapel Hill, and Wilmington, are beginning to work on acquiring these trucks.

Other commonly reported implementation strategies include completing a fleet study to help determine best practices for converting fleets to alternative fuel. Studies like this can provide insight into which vehicles are most suitable to be converted to EVs, help plan for charging infrastructure and break down other fleet strategies like fuel conservation. Nine municipalities have completed a fleet study, fleet plan, or similar assessment, including Apex, Carrboro, Chapel Hill, Charlotte, Durham, Forsyth County, Mecklenburg County, Raleigh, and Wake County.

An early step that municipalities can take before pursuing fleet electrification is to improve fuel conservation techniques. Right-sizing is an early step in the process as it can help reduce unnecessary fuel consumption. Telematics, such as Automatic Vehicle Locators (AVL), is helpful for this analysis. Winston-Salem was an early adopter of AVL on city fleet vehicles after completing a pilot program in 2013. Technology like AVL and telematics can provide vehicle usage details and inform decisions for right-sizing fleets.

Idle reduction is another fuel conservation strategy that municipalities can consider in their fleet transitions[4]. Municipalities like Morrisville and Wake County are piloting idle reduction and mitigation strategies on fire trucks and ambulances, respectively.

Another strategy for implementation is to conduct pilot program or begin with targeted replacements for particular departments' vehicles and other equipment. For example, Orange County is piloting a propane bi-fuel project with the Sheriff's Office in 15 vehicles, and Holly Springs is testing EVs in the development services department.

[4] Source: www.afdc.energy.gov/conserve/idle_reduction_basics.html

LEADER

The City of Charlotte has the highest number of electric vehicles currently in a municipal fleet and is therefore a leader in implementation. With 63 currently in their fleet and another 55 in the budget for the fiscal year 2022-2023, they will have purchased over 100 EVs for their fleet. They also continue to acquire charging stations, with 25 purchased this fiscal year alone.

3.2 Public Electric Vehicle Supply Equipment

Municipalities are also involved to varying degrees in installing publicly accessible electric vehicle supply equipment (EVSE). Municipalities can utilize policies to encourage installations on properties not owned by the local government. However, this is not a common approach in North Carolina. They can also focus on public installations at priority local government sites. Some municipalities are also working to identify suitable sites within their jurisdictions to encourage other groups and organizations to install public EVSE.

3.2.1 Policies

Electric Vehicle Make-Ready policies are a growing policy approach for municipalities to encourage EVSE installations, though these policies have yet to be widely adopted by North Carolina municipalities. Make-Ready policies involve "preparing a location (residential or commercial) at the time of construction or major renovation to efficiently add EV charging capabilities and stations at a later time." This location preparation reduces costs for the future project by four to six times compared to a retrofit.[5]

LEADERS

The City of Charlotte has incorporated EV considerations into their Unified Development Ordinance for off-street parking spaces, seen in Table 1. The changes were approved in August 2022, effective June 1, 2023. This policy example is the nearest EV Make-Ready policy in the state.

Total Number of Provided Off-Street Parking Spaces	EV-Capable Spaces	EVSE-Installed Spaces
0-9 spaces	None	None
10-25 spaces	20% of spaces (rounded up)	None
26-50 spaces	20% of spaces (rounded up)	1 space
More than 50 spaces	20% of spaces (rounded up)	2% of spaces (rounded up)

Table 1. City of Charlotte EV-Readiness

3.2.2 Implementation Strategy

Heatmaps are a planning tool to identify potential locations suitable for public EVSE installations. Raleigh and Chatham County are two municipalities that have created these maps to help them plan for future EVSE.

Multiple programs are also available to North Carolina municipalities to incentivize public EVSE installations. Some are participating in the Duke Energy EV Pilot Program, also called Park & Plug, to install charging stations at no cost to the municipalities. The program's goal is for Duke Energy to install,

[5] Source: Plug-In NC City of Raleigh Playbook, page 11.

own and operate 100 Level 2 charging stations at 50 key public sites and 24 DC Fast Charge stations at 12 sites to encourage more public charging[6]. The City of Winston-Salem is receiving three Level 2 charging stations through this program to increase local public EVSE.

The grants available through the North Carolina Department of Environmental Quality (DEQ) VW Settlement fund are another pathway municipalities use to fund public EVSE projects. The NC DEQ disbursed Phase 1 funds in 2021. Carrboro, Apex, Chapel Hill, Durham, Raleigh, and Chatham County received awards for either DC Fast Charge or Level 2 charging stations. Winston-Salem applied for funds for a DC Fast Charge, but due to restrictions for proximity to an alternative fuel corridor, the NC DEQ did not select application for an award. As of February 2023, nine municipalities from this report, including Winston-Salem, have been awarded funds through phase 2 of this grant opportunity for Level 2 charging stations.

LEADER

A significant development for EV planning was the completion and publication of Raleigh's EV-Ready Playbook: A Guide for Charging Station Preparation, Installation, and Management, developed in partnership with Advanced Energy. While developed for the City of Raleigh, the playbook includes basic principles for EVSE planning to make the playbook applicable to other municipalities, particularly in North Carolina.

Regarding the implementation of public EVSE, the City of Charlotte has been responsible for installing an estimated 50 public charging stations, mostly located in visitor's lots. That number of stations is the most publicly available EVSE a municipality has had installed, but Raleigh (34) and Orange County (23) also have significant public installation numbers.

IV. Greenhouse Gas Emissions

Greenhouse gas emission studies and mitigation are a central facet of sustainability work. Two main aspects of greenhouse gas mitigation are energy efficiency and renewable energy projects. These are also two of the most shared characteristics of sustainability goals, the most common being to achieve 100% clean renewable energy by 2050. Several municipalities also have carbon neutral or zero carbon goals. Details of these goals are in Appendix C.

The state has set several goals under the Governor Cooper administration regarding greenhouse gas emissions reductions through various executive orders and the 2020 Clean Energy Plan. Chronologically by the target date, the state has a 40% GHG emissions reduction by 2025[7], a 50% GHG reduction[8], and a 70% emissions reduction from the electric power sector by 2030[9], and achieve net-zero emissions as soon as possible, no later than 2050[10]. The baseline year for all goals is 2005.

4.1 Energy Efficiency

Energy efficiency and emissions reductions are standard components of municipal sustainability goals across the state. Over half of the municipalities surveyed set an emissions reduction or carbon neutral goal. Winston-Salem set a goal of 40% emissions reduction by 2025. The year most common specifics included in these goals is 2025 for the reduction goal year and 40% for the reduction percentage goal.

[6] Duke Energy Park & Plug
[7] Executive Order 80, 2018
[8] Executive Order 246, 2022
[9] NC Clean Energy Plan, 2020
[10] Executive Order 246

4.1.1 Policies

A typical policy approach many municipalities have taken to address energy efficiency is establishing a sustainable facility policy. These goals generally set a minimum LEED green building standard for municipal buildings of a specific size for both new construction and renovations, where feasible with consideration of financial impacts. LEED standards incorporate a holistic approach to mitigating climate change through building standards, including credit categories for energy efficiency, location and transportation, sustainable sites, water efficiency, energy and atmosphere, indoor environmental quality, and more.

Municipalities implementing a sustainable facility policy include Asheville, Buncombe County, Chapel Hill, Charlotte, Chatham County, Durham County, and Raleigh. More municipalities are working to adopt similar policies in the future.

LEADER

Like other cities, the Town of Chapel Hill has established a sustainable facility policy with additional standards to increase energy reduction efforts. The policy sets a LEED Silver requirement of over 5,000 square feet for new construction. It must also meet the energy reduction benchmarks of the Architecture 2030 Challenge. Renovations over 5,000 square feet must satisfy at least half of the Architecture 2030 challenge reduction benchmarks. While other municipalities have stricter LEED standards, the Architecture 2030 Challenge specifically includes energy reduction goals. As of 2020, the fossil fuel reduction standard for all new buildings and major renovations is 80% below the regional average for the building type. The 80% threshold will be increased to 90% by 2025 and carbon-neutral in 2030. By combining the Architecture Challenge reduction standards with LEED standards, the Chapel Hill policy standards stand out as the most stringent for carbon reduction measures.

4.1.2 Implementation Strategy

In communities that do not have a formal policy, many are still taking action to reduce energy efficiency in municipal facilities. These actions include LED conversions in facilities and streetlights, energy audits of municipal buildings, and HVAC upgrades. Of these actions, Winston-Salem has most pursued LED upgrades in facilities as an energy efficient measure.

Decisions on which upgrades to pursue can come from internal staff audits or through an energy services company (ESCO), or a form of energy/performance contracting. These groups provide consultants to perform energy audits with recommendations that will save energy and money for building owners. Examples of North Carolina municipalities utilizing this form of assistance are Durham County and the Town of Morrisville for assessments of various facilities and the Town of Davidson for energy efficiency building upgrades.

LEADER

With many municipalities taking action to implement energy efficient technologies, the Sustainable Energy Support Hub[11] from the North Carolina Sustainable Energy Association (NCSEA) was utilized as a resource to better understand the progress within towns and cities as it relates to energy efficient buildings. According to this source, the City of Charlotte has the highest number of Energy Star and LEED Certified buildings and most square footage accounted for. However, in comparing the number of buildings and square footage to the population size, the Town of Davidson has the most buildings certified per capita, and the Town of Wake Forest has the most certified square footage per capita.

[11] Source: https://energync.org/dataplatform/, data table Number 10 – Energy Star and LEED Certified Buildings II

4.2 Renewable Energy

Renewable energy goals are the most common for municipalities to establish. All municipalities that have set a renewable energy goal have included a 100% renewable energy goal by no later than 2050. However, four have established an earlier deadline for municipal operations, usually either by 2030 or 2040. Almost half of the municipalities have also set these renewable energy goals at the community level.

4.2.1 Policies

Many municipalities do not have formal or specific policies to support local renewable energy goals. However, those pursuing LEED certification through a sustainable facility policy can gain credit towards certification for having installed renewable energy systems. In this way, municipalities can use policy to support renewable energy installations.

LEADERS

A few municipalities have expanded their existing sustainable facility policy to address renewable energy directly. Buncombe County includes solar-ready requirements as a minimum requirement for new construction projects. The City of Charlotte has a comprehensive policy that includes renewable energy systems in commissioning for all new construction projects, on-site system requirements for all new construction projects for buildings over 5,000 square feet, and a solar-ready requirement at minimum for those facilities over 5,000 square feet.[12]

4.2.2 Implementation Strategy

There are cohorts of municipalities partnering to promote more residential solar installations in 'Solarize' campaigns. Examples of this include Solarize the Triangle and Solarize Asheville-Buncombe. A total of twelve municipalities are involved in one of these Solarize campaigns to encourage residential solar.

Some municipalities also pursue a national SolSmart designation at bronze, silver, or gold levels. Receiving designation through this program allows participants to receive no-cost technical assistance from national experts to accelerate local opportunities for solar energy growth[13]. Thirteen municipalities have completed this designation.

Additionally, eighteen municipalities reported complete, active, or planned solar projects for various municipal facilities such as fire stations, bus stations, office buildings, and libraries. Winston-Salem has one active solar project with future planned installations utilizing capital improvement funds. There are also municipalities with ground mount systems, such as Raleigh, though fewer of those projects exist.

While solar PV is the focus of most renewable project implementation, some municipalities also utilize geothermal energy for facilities. Chapel Hill, Durham County, and Raleigh are three municipalities who have successfully implemented this technology to support their facilities.

LEADERS

The Town of Boone achieved 100% renewable energy for all town operations in 2022, with 75% of the generation from solar power and the other 25% from hydropower, making them a leader in local government operations implementation. It is important to note that the Town of Boone is not part of Duke Energy's territory.

[12] Source: City of Charlotte Sustainable Facilities Policy
[13] Source: https://solsmart.org/

Several communities are making significant progress toward achieving community-level success in renewable energy implementation. Durham County and the City of Charlotte are pursuing agreements with Duke Energy to participate in the Green Source Advantage program for large-scale solar investment for systems at 10.5 MW and 35 MW, respectively. Buncombe County is also working on dozens of individual installations within the jurisdiction with a total estimated capacity of over 6 MW and has a 5 MW solar farm that will be completed by the end of FY 22-23 on a retired landfill.

V. Other Trends

In the initial survey, participants had the opportunity to provide information on other projects relevant to their sustainability work. The data collected related to food waste, additional waste reduction, natural landscaping, and miscellaneous. Each section explores what was reported by peers as well as any related efforts from Winston-Salem.

5.1 Food Waste

While still relatively uncommon in sustainability work, food waste efforts are becoming more widespread across the state as a focus for sustainability staff. This work usually takes the form of pilot programs for various approaches to residential composting coordinated at the community level. These pilots are generally a result of a waste characterization study that break down the sources in a local waste stream.

The City of Asheville has established a Food Waste Reduction Initiative that aims to inform residents on managing food waste and compost. They participated in the Natural Resources Defense Council's Food Matters Regional Initiative Southeastern cohort in 2020 to help them explore food waste strategies at city facilities, support community coalition building and strengthen the visibility of food waste reduction efforts. Asheville has also partnered with Buncombe County to offer residents a free food scrap drop-off program with six drop-off locations.

In February of 2022, The Town of Cary set up a food waste recycling drop-off pilot program for residents to reduce the amount of food waste going into the landfill. Cary set this up after a Wake County waste characterization study from July 2019 found that just over 27% of single-family residential waste was food waste. After one year of the pilot, the program became a permanent service in February 2023. The program has collected over 82,000 pounds of food waste, creating just over 8,000 pounds of compost[14].

The Town of Davidson is participating in a compost pilot program for residents with grant funding provided by the NC DEQ, after a 2011 Mecklenburg County Waste Diversion Study found that about 27% of landfill waste was compostable. Residents who sign up receive a container to collect their food waste, which they can take to one of five 24/7 food waste drop-off sites in the town. A local company is responsible for managing the food waste from the drop-off locations and using it in local parks. Nearly 200 households are composting over 525 pounds of food waste per week that is successfully diverted from the landfill. The pilot program is set to end in June 2023.

The City of Durham runs a multi-phase pilot program for food waste collection[15], which Atlas Organics collects and turns into compost. Phase one of this pilot focused on educating and communicating to residents how to properly compost and gathering input from residents to do so. Phase 2 of the program has an estimated 500 households participating and will assist the project team in assessing the potential impact if the city implements the program across the whole city.

[14] Cary Composts – Food Waste Recycling
[15] Durham Food Waste Collection Pilot

The City of Winston-Salem has a food resilience program focusing more on increasing food access in underserved areas through programs such as the Liberty Street Urban Farmer's Market and the Kimberley Park Hydroponics Farm. There is currently no program like those mentioned above to address food waste being run by the WSOS, but local programs are in place for residents thanks to local composting groups.

5.2 Waste Reduction

Waste reduction efforts, separate from food waste, are another recurring focus in the work of local government sustainability practitioners. These efforts also vary the most in terms of scope and subject matter.

Two municipalities, Apex and Asheville, have set solid waste reduction goals. The Apex waste reduction goal applies to the town operations, while the Asheville goal is for 50% municipal solid waste reduction by tonnage by 2035 from a 2010 baseline.

Asheville, Durham County, and Raleigh have targeted plastic waste reduction. Asheville has successfully removed the requirement of utilizing plastic bags for the leaf program, reducing local plastic bag use. Durham County has established an internal policy banning plastic water bottles in county facilities. Raleigh has launched a program called freeFILL to encourage members of the public to reuse water bottles by providing public water bottle refill stations at city and private facilities to reduce single-use plastics.

Staff from the City of Salisbury and the Town of Wake Forest, as members of their respective Public Works Departments, focus more on their sustainability work on recycling and therefore pursue waste reduction through that lens. Both municipalities are working to reduce contamination in the recycling stream. Salisbury's formal goal is to reduce the contamination rate to less than 20% through implementation strategies such as cart audits. Salisbury sustainability staff also focus on reducing community litter and regularly organize litter sweeps and cleanups.

Wake Forest is exploring different waste container technologies to improve the efficiency of public waste collection. The town has replaced its Big Belly receptacles with Clean Cube solar-powered trash compactor receptacles and is testing MyMatR waste sorting receptacle technology. The MyMatR company was founded in Raleigh in 2019. It uses smart technology in their waste containers to automatically sort material at the source.

The City of Winston-Salem Office of Sustainability is involved in a significant recycling effort by overseeing the in-house recycling transition to city crews. This transition will increase customer service but will also address waste reduction through the staff's ability to execute contamination education more effectively.

5.3 Natural Landscapes

Natural landscaping projects and ordinances are a growing trend for sustainability staff in local government. There is also a wide variety of approaches to this work. One more formal way is to incorporate relevant language into local ordinances. Carrboro, Cary, and Hillsborough have all done this with differing intents. Other municipalities are actively implementing more natural practices that prioritize native plants, such as Mecklenburg County and Wake County.

As the third municipality nationwide to become recognized as a Bee City USA, the Town of Carrboro's Least Toxic Integrated Pest Management and Plant Health Care policy focuses on managing pests with the least impact on the environment and people. Their policy applies to town operations only. Carrboro also has established a policy through the Carrboro Town Code to allow residents to install a recognized

managed natural landscape in a yard emphasizing native plants, increasing biodiversity, and other relevant environmental preservation efforts[16].

Cary's natural landscaping ordinance focuses on conserving water by requiring drought-tolerant plants for all commercial landscapes.[17]There is further landscaping guidance in the Community Appearance Manual for residents. Recent emphasize the importance of native planting and prohibits invasive species. Cary also has a program, Cary Garden for Wildlife, in partnership with the National Wildlife Federation's Community Wildlife Habitat Program, that allows residents, schools, and common areas to become officially certified as wildlife habitats. Internally, staff also take steps to implement natural landscaping techniques. Public Works staff install pollinator gardens and habitat corridors, and transition turf in facility areas to orchards, rain gardens, other pollinator gardens, and more to embrace and promote natural and native environments.

The Town of Hillsborough adopted a Managed Natural Landscape ordinance[18] in 2019, which grew out of interest from the Hillsborough Tree Board. The ordinance allows residents to establish natural landscaped areas on their property, either in meadows or more deliberately planted areas that are maintained to specific guidelines. About a dozen homes in the town have utilized the new allowances established by the ordinance.

Mecklenburg County is physically implementing techniques in landscaping that include using prescribed burns and removing invasive species in county parks and nature preserves. This approach provides more natural control of weeds reducing the need for pesticide use.

Wake County's natural landscaping methods focus on reducing the local water demand. The county uses drought-tolerant and native plant species to replace the need for irrigation.

As part of the Bee City USA program, the City of Winston-Salem is increasing local efforts to address the importance of natural landscaping. The WSOS staff is working on a pilot project to test alternative forms of weed control compared to the current methods. This work will eventually inform a local integrated pest management plan. There are also efforts to emphasize native pollinator plants in landscaping practices, with eleven species currently used in city flower beds. Utilizing native plants generally requires less maintenance as they are accustomed to the conditions of the local ecosystem.

5.4 Miscellaneous

This section highlights the additional projects reported by municipalities that do not correspond to a previous section.

5.4.1 LEED for Cities and Communities

The LEED for Cities and Communities certification has become a new trend for municipalities as a framework to review sustainability-related efforts within a municipality. The program is offered through the US Green Building Council and is also available internationally. Since being made first available in 2021, six North Carolina municipalities, including Winston-Salem, have become certified, and at least one other local government, the Town of Davidson, is seeking certification. The municipalities and the certification levels are as follows:

- Charlotte – Gold Certification, 2021
- Durham City/County Joint – Gold Certification, 2022

[16] Carrboro Town Code Chapter 11, Article 2, Sections 11-8 and 11-9

[17] Town of Cary Natural Landscaping

[18] Town of Hillsborough Managed Natural Landscape Ordinance

- Greensboro – Silver Certification, 2020
- Orange County – Gold Certification, 2022
- Winston-Salem – Silver Certification, 2022

5.4.2 Urban Heat Islands

In 2021, Raleigh and Durham collaborated on the CAPA Heat Watch program in partnership with the National Integrated Heat Health Information System, the National Oceanic and Atmospheric Administration's Climate Program Office, and National Weather Service. Each jurisdiction sent volunteers to gage the heat on various routes during the morning, afternoon, and evening of one predetermined day. A final report was produced analyzing the results for a better understanding of the hottest areas of the municipalities that can be incorporated into planning efforts. The City of Winston-Salem applied to participate in the 2023 campaign but was not selected.

5.4.3 Green Awards

A couple of municipalities are recognizing community members, groups, and organizations taking steps to promote sustainable actions. This approach can encourage more sustainable community efforts and increase participation from private sector groups, NGOs, educational institutions, and individuals.

Raleigh presents awards in eight categories and has two competitions for the Raleigh Environmental Awards[19], presented during an event during Earth Week. Winners are selected by members of Raleigh's local environmental board based on predetermined eligibility requirements and award criteria.

Greensboro set up the inaugural Live Green awards in 2023 with awards in seven categories in partnership with the Community Sustainability Council where awards will be presented at an Earth Day event. Greensboro established these awards to encourage the community to become a more sustainable community.

5.4.4 Climate Justice

The City of Asheville is working on a unique program to address equity and justice concerns in its sustainability and climate work. After declaring a Climate Emergency in January 2020, the city began a concerted effort to reduce the disproportionate threat of climate change on low-income communities and communities of color. Asheville established the Climate Justice Initiative, which has led the city to define climate justice and climate equity, the creation of their climate justice data map and a climate justice screening tool. This project and related work exemplify one of the most direct efforts of municipalities to address equity concerns by including members of the city's frontline communities.

5.4.5 Green Roofs

Durham County has implemented green roofs on two county facilities, including the Durham County Library, which was completed in 2021. The green roof was included as part of the complete renovation of the 1978 building. The library is also LEED Gold certified, covered by the Durham County sustainable facility policy.

Final Review

In North Carolina, local government sustainability practitioners are working on projects to address greenhouse gas emissions and alternative fuel vehicle progress. Other trends also focus on food waste,

[19] Raleigh Environmental Awards Program

waste reduction, and natural landscaping. These are all topics that the City of Winston-Salem is working on, though with more opportunities for progress.

Winston-Salem has set a 40% emissions reduction by 2025 and 50% clean and renewable energy by 2030, and 100% by 2050 targets for municipal operations in line with many other municipalities. In terms of progress in reaching these goals, the city has completed some initial energy efficiency upgrades primarily focused on lighting in larger facilities and invested capital improvement funds on solar PV installations. These efforts have allowed progress to be made on achieving the targets, but this report present many examples of future efforts for the city to pursue. Potential actions include establishing a sustainable facility policy, completing a SolSmart designation, or working with nearby municipalities to develop a new Solarize campaign in the Triad.

The fleet goals in Winston-Salem are included in the previously mentioned targets, setting a 50% clean fleet goal by 2030 and 100% by 2050. While the city currently has two EVs in the fleet, four more will be purchased in the upcoming year, and staff will work to increase this number further. Those four new EVs will put the city in line with the average number of EVs in North Carolina municipal fleets. Potential actions the city can pursue to increase progress include establishing a sustainable fleet policy or evaluation process or completing a fleet study.

Winston-Salem is also following the upcoming trends, with progress being made on waste reduction and with plans already in place to increase local natural landscaping efforts. While there is not a major effort to address food waste being led by the city, Winston-Salem is a leader in food access work, which was not widely reported on by the participants, with unique projects like the Kimberley Park Hydroponics Farm. If these trends become local priorities for future projects, potential actions that can be pursued include setting a waste reduction goal, completing a waste composition study of the local waste stream, or including natural landscape allowances in an ordinance for residential lawns.

While more trends are likely to emerge and as more progress is made across the state, municipalities across North Carolina will continue to collaborate on efforts through the Cities Initiative and SSDN to encourage sustainability advancement on a broader scale.

Appendix A

NC Municipal Sustainability Summary Report

Winston-Salem staff has been tasked with creating a sustainability comparison report for municipalities across the state to present to our elected officials. I am focusing on the municipalities that are part of the Cities Initiative group and/or Southeast Sustainability Director's Network. Please complete the following form at your convenience. The final report will be shared within the networks.

hpeplowski2011@gmail.com (not shared) Switch account

* Required

Which department in your organization do you work in? *

- ◯ Town/City Manager's Office
- ◯ Public Works/General Services
- ◯ Environmental Services/Quality
- ◯ Stand-alone Office of Sustainability
- ◯ Other: _____

How many total staff are dedicated to sustainability work in your department or office? *

Your answer

Do you have any municipal fleet goals or targets? If so, please list the details (i.e. x% by x year will be alt fuel/EV/etc.).

Your answer

If your municipal fleet has EVs and/or other alternative fuel vehicles, please provide what fuel source they use and how many of each there are.

Your answer

Does your municipality have any other equipment that has been changed from diesel or gas fueled to electric? If so, please list.

Your answer

How many, if any, public EV charging stations has your municipality been responsible for installing? If so, please also include if a fee is being charged for use.

Your answer

Has your municipality been financially responsible for renewable energy installations? If so, please provide any details you may have such as the type of renewable(s) used, number of facilities/properties with or powered by renewables, the total generation or carbon offset capacity, cost of installation, expected ROI, etc.

Your answer

Does your municipality have policies or plans for any of the following (please also consider any informal policies/internal guidelines):

- [ ] Fleet electrification/alternative fuel (light, medium, and heavy duty)
- [ ] Other equipment electrification (i.e. mowers, leaf blowers, etc.)
- [ ] Green building standards or energy efficiency work (i.e LEED or EnergyStar standards, solar ready, purchasing practices to prioritize efficiency, etc.)
- [ ] Public or municipal EVSE
- [ ] Natural landscaping (i.e. native plants, natural pesticide or integrated pest management, 'no mow' areas, etc.)
- [ ] Other: _____

If you checked any of the above, please expand on what those policies or plans include. Feel free to include links to any plans or policies if that's easier.

Your answer

Are there any other notable projects, policies or programs that have been or will be implemented in your community related to sustainability or your work that you would like to mention?

Your answer

Are you open for follow-up questions if there are any? *

- ○ Yes
- ○ No

If yes, please include the best contact for further questions.

Appendix B

MUNICIPALITY	DEPARTMENT	NUMBER OF STAFF
Town of Apex	Budget & Performance Management	2
City of Asheville	Office of Sustainability	3
Town of Boone	Town Manager's Office	1
Buncombe County	Sustainability Office	2
Town of Carrboro	Planning	2
Town of Cary	Town Manager's Office	3
Town of Chapel Hill	Town Manager's Office	3
City of Charlotte	General Services	4
Chatham County	Environmental Quality	1
Town of Davidson	Parks and Recreation	0.5
City of Durham	General Services	4
Durham County	Engineering & Environmental Services	3
Forsyth County	Environmental Assistance & Protection	2
City of Greensboro	City Manager's Office	1
Town of Hillsborough	Public Space and Sustainability Division	1
Town of Holly Springs	Budget, Innovation and Strategy	1
Mecklenburg County	Manager’s Office	3
Town of Morrisville	Public Works Dept	1
Orange County	Asset Management Services	1
City of Raleigh	City Manager's Office	5
Town of Salisbury	Public Works Dept	1
Wake County	General Services	3
Town of Wake Forest	Public Works Dept	1
City of Wilmington	Public Services	1
City of Winston-Salem	Office of Sustainability	5

Appendix C

	DETAILS OF SUSTAINABILITY GOALS
Apex	For municipal operations, achieve 80% clean energy by 2035, 100% clean energy by 2050 and 100% clean fleet by 2050
Asheville	80% community emissions reduction by 2050; 100% renewable energy by 2030 for city operations and 100% by 2042 for community
Boone	In municipal operations achieve climate neutrality by 2030; 100% clean renewable energy in operations by 2040; 100% clean renewable energy for community by 2050
Buncombe Co	Achieve 100% renewable energy for operations by 2030 and 100% renewable energy for community by 2042
Carrboro	Achieve 80% emissions reduction by 2030 in municipal operations and the community
Cary	Reduce carbon emissions by 25% in the community by 2025; Achieve 100% emissions reduction by 2040 in the community from a 2018 baseline
Chapel Hill	Achieve 80% clean renewable energy by 2030 and 100% by 2050 in the community; Reduce emissions 50% by 2030; net zero by 2050 electrify all fleet passenger vehicles by 2040; electrify all fleet heavy-duty vehicles by 2050
Charlotte	Reach 40% emissions reduction by 2030; Achieve zero carbon for municipal operations and fleet by 2030; 85% community emissions reduction by 2050
Chatham Co	Achieve 100% clean energy by 2050 in the community
Davidson	Achieve carbon neutral municipal operations by 2037
Durham	Reduce emissions 50% by 2030 in municipal operations, achieve 80% renewable energy by 2030, carbon neutrality by 2040 and 100% renewable energy by 2050 for municipal operations; increase electrification of fleet vehicles
Durham Co	Achieve 80% renewable energy by 2030 and 100% by 2050 for municipal operations
Forsyth Co	Achieve 100% clean renewable energy by 2050 for municipal operations
Greensboro	Reduce GHG and energy per sq ft 40% by 2025, and reach 100% renewable energy by 2040 for municipal operations
Hillsborough	Achieve 100% clean renewable energy by 2050 for the Town with an interim goal of 80% clean renewable energy by 2030
Holly Springs	N/A
Mecklenburg Co	Reach net zero carbon sources for operations and fleet by 2035
Morrisville	N/A
Orange Co	Reduce emissions 26-28% by 2025 and reach 100% renewable energy-based economy by 2050 for the community
Raleigh	Achieve 80% greenhouse gas reduction by 2050 from a 2007 baseline for the community
Salisbury	40% emissions reduction by 2025 (matches the state goals)
Wake Co	Achieve 80% renewable energy by 2035 and 100% clean energy by 2050 for municipal operations and fleet
Wake Forest	N/A
Wilmington	Achieve 50% clean energy by 2035 and 100% by 2050 for operations; electrify 50% of city fleet by 2035 and 100% by 2050
Winston-Salem	For municipal operations, achieve 50% clean renewable energy by 2030 and 100% clean renewable energy by 2050; 40% emissions reduction by 2025