THE CITY OF CHARLOTTE AVIATION DEPARTMENT

Comprehensive Sustainability Plan

June 25, 2020

Prepared for:

CLT CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT

Prepared by:

L&B Aviation Planning at the Leading Edge

Gresham Smith Genuine Ingenuity

HDR

Ross&Baruzzini

INTEGRAL GROUP

LYERLY AGENCY Brand Marketing Public Relations

Version 1.0

CONTENTS

EXECUTIVE SUMMARY

The City of Charlotte Aviation Department's Comprehensive Sustainability Plan (CSP) is intended to guide airport leadership and staff to deliver on a set of sustainability performance goals and targets over the next 20 years. The Plan was developed in consultation with internal staff, external stakeholders and community members, and reflects the Airport's ambition to improve efficiency while reducing impacts associated with its operation. Furthermore, the Plan was designed to support and align with the City of Charlotte's Strategic Energy Action Plan (SEAP) that establishes the framework to guide Charlotte's transition to a low-carbon future.

Sustainability Approach and Guiding Principles

Sustainability is defined in the context of this plan as holistically addressing environmental, social and economic requisites, to ensure reduction of harm to the environment, improving conditions for customers, employees and the community, and ensuring the ongoing prosperity of the Airport as a business and economic engine for the region.

The Airport's internal stakeholder team developed the following set of guiding principles to direct the development of this Plan:

- ✓ ***IMPACT****: Sustainability should be a core airport objective, with measurable targets, outcomes, and a mechanism for reporting.*
- ✓ ***LEADERSHIP****: The Plan should position CLT as a leader in environmental, social, and economic sustainability, adhering to the "EONS" approach (see page 8).*
- ✓ ***COLLABORATION****: The Plan should align with the City of Charlotte's sustainability objectives which and be developed collaboratively with internal and external stakeholders.*
- ✓ ***INTEGRATION****: Sustainability should be integrated into planning, design, construction, operations, and maintenance.*

Plan Structure

Through the engagement process, stakeholders established a set of 'focus areas' that align with key areas of Airport operations that also relate to specific elements of sustainability. Each Focus Area consists of a set of goals and targets and contains a set of recommended strategies that comprise the core of this Plan. Each strategy includes a background summary, cost estimate, implementation framework, responsible parties, and special considerations.

Focus Areas

Waste	
Goals	➢ Increase waste diversion ➢ Minimize food waste disposal ➢ Reduce waste generation
Targets	➢ 75% Diversion rate from all CLT-controlled operations ➢ Zero food waste to landfill (back of house) ➢ 10% Reduction in total waste volume
Strategies	**GENERAL WASTE MANAGEMENT** W1 Conduct waste composition study W2 Formalize waste reduction program and track progress W3 Pursue zero waste certification **FOOD WASTE** W4 Participate in EPA food recovery challenge W5 Vendors: Increase food recovery/donation W6 Phase in organics composting

CONCESSIONS

W7 Introduce waste management policy for concessionaires
W8 Educate vendors, staff, and passengers
W9 Reduce single use disposable items

CONSTRUCTION WASTE

W10 Increase and track construction waste diversion

AIRLINE WASTE

W11 Improve diversion of waste from flights

Health

Goals	➢ Support employee, tenant, and passenger health ➢ Design spaces to enhance passenger comfort and health
Targets	➢ Increase employee participation in health and wellness programs ➢ Meet or exceed best practice indoor and outdoor air quality standards
Strategies	**CERTIFICATIONS AND DESIGN STANDARDS** H1 Explore third-party health standard certification **EMPLOYEE PROGRAMS** H2 Conduct employee and passenger surveys to determine health priorities H3 Introduce health and wellness program based on survey results **AIR QUALITY** H4 Implement clean construction policy H5 Introduce indoor air quality specifications for all materials H6 Introduce non-idling policy

Energy and Emissions

Goals	➢ Reduce energy use and emissions from airport operations ➢ Increase renewable energy supply and/or purchase ➢ Increase use of alternative fuel vehicles
Targets	➢ Strive towards 100% zero carbon airport-owned buildings ➢ Strive towards 100% zero carbon airport-owned fleet
Strategies	**RENEWABLE AND LOW CARBON SUPPLY** EE1 Increase onsite renewable energy EE2 Assess feasibility of central energy plant with low carbon energy supply EE3 Purchase renewable energy credits or other offsite renewable supply EE4 Pursue ACI Carbon Accreditation **OPERATIONS AND MAINTENANCE** EE5 Use automated "smart" HVAC and lighting controls EE6 Track energy use through monitoring and sub-metering EE7 Explore feasibility and impact of green roofs **FLEET AND VEHICLES** EE8 Develop unified fleet strategy EE9 Explore feasibility of electric shuttle bus fleet EE10 Provide vehicle charging infrastructure at all parking facilities EE11 Continue to work with airlines to convert GSE to electric EE12 Develop a sustainable logistics delivery policy

Water, Stormwater and Landscape

Goals

- Reduce water use per passenger in terminal
- Improve stormwater capture, treatment, and reuse
- Improve quality and reduce impact of landscapes

Targets

- Reduce water use per passenger by 15%
- Capture and treat 50%-90% of stormwater

Strategies

POTABLE WATER CONSERVATION

WSL1 Install smart meters and sub-meters
WSL2 Retrofit fixtures to most efficient models
WSL3 Use non-potable water for toilet flushing, irrigation, cleaning, and cooling towers

STORMWATER MANAGEMENT

WSL4 Assess chemical composition of runoff at lowest points
WSL5 Maximize permeable surfaces to slow stormwater

LANDSCAPE

WSL6 Select landside plants, focusing on native plants, that maximize stormwater retention
WSL7 Explore introduction of grazing herd for landscape maintenance

Transportation

Goals

- Reduce single-occupancy vehicle use and increase sustainable modes of transportation
- Increase alternative fueling infrastructure
- Reduce congestion and idling

Targets

- Increase alternative transportation and ride share to 50% of trips
- Adopt best practice targets for EV charging infrastructure

Strategies

EMPLOYEE COMMUTE

T1 Survey employee commute
T2 Expand ride share programs with incentives
T3 Improve cycling and pedestrian access to CLT

REGIONAL TRANSPORTATION

T4 Serve as an advocate in regional transportation planning

SURFACE TRANSPORTATION AND PARKING

T5 Digital display of parking spots available

Community, Equity and Economic Development

Goals

- Increase awareness of diversity, equity and inclusion policies
- Demonstrate commitment to local community capacity building
- Support employee professional and personal development

Targets

- 100% of Aviation Department employees to go through diversity and sustainability training
- Annual employee volunteer hours and participation in outreach programs
- Annual hours staff education/career development training

Strategies

EMPLOYEE AND HUMAN RESOURCES

CEE1 Build upon career and training opportunities for employees and community
CEE2 Expand trade school recruitment programs at local community colleges

EQUITY

CEE3 Develop diversity and sustainability training for employees
CEE4 Continue to provide multi-lingual assistance to passengers

COMMUNITY IMPACT

CEE5 Continue employee volunteer program
CEE6 Develop a fund to support local community economic development
CEE7 Develop strategic community engagement plan

1. INTRODUCTION

1.1 MESSAGE FROM THE AVIATION DIRECTOR

In June of 2018, the Charlotte City Council passed the Sustainable and Resilient Charlotte by 2050 Resolution, setting aggressive and aspirational goals for municipal and community-wide greenhouse gas emissions reductions. Specifically, it strives to have city fleet and facilities fueled by 100 percent zero-carbon sources by 2030. It also set a community-wide goal for Charlotte to become a low carbon city by 2050. The Strategic Energy Action Plan (SEAP), adopted by City Council in December of 2018, outlines how Charlotte will reach its goals by defining 11 linked action areas focused on transportation, buildings, energy generation, workforce development/equity.

Today, I am pleased to present the City of Charlotte Aviation Department's Comprehensive Sustainability Plan, which reflects the Airport's commitment in helping the City achieve the objectives outlined in the SEAP. Developed in collaboration with staff, stakeholders and community members, our Comprehensive Sustainability Plan is centered around six focus areas, each supported by their environmental, economic, and/or social performance targets and goals.

This plan will enable us to become a leader in environmental stewardship by implementing best practices to help minimize the environmental impacts of our operations for the benefit of our local community. It also will lead us to achieve Airport Carbon Accreditation, a sought-after global standard for carbon management in the airport industry.

Charlotte Douglas International Airport leads North Carolina as the top economic engine among the state's airports, contributing more than 23 billion to the economy. With that, comes the responsibility to provide economically viable sustainable solutions to our employees, our tenants, our passengers, and our region.

This plan is a living document that will evolve as building principles and design become more resilient and new technologies emerge. We anticipate it will create new benefits and business opportunities for CLT as we continue to build partnerships with our stakeholders and interested community groups. Over the next 20 years, we will use it as our guide as we adopt new sustainable practices into our daily operations.

The Aviation Team is both proud and excited about this endeavor. I invite each of you to delve into this plan to learn more about our goals and find ways that you can personally support them.

Sincerely,
Brent Cagle

Note to Readers: This document was completed prior to COVID-19. Our performance goals and targets related to Sustainability remain the same, but timelines could be affected by the pandemic.

1.2 SUSTAINABILITY VISION

Charlotte's Vision for Sustainability and Resilience[1]

Charlotte's Vision / Mission

The Charlotte City Council's vision states, "Charlotte will become a global leader in environmental sustainability, balancing economic growth with preserving our natural resources."

Charlotte will lead, as a global city, by continuously improving, protecting, and preserving the environment, its community, and economy, while ensuring equity and resilience- for today's and future generations.

Our Values

The City of Charlotte recognizes that protecting our natural resources, promoting conservation, and improving the environment is fundamentally important to quality of life and essential to maintaining a vibrant economy. Charlotte will become a global leader in environmental sustainability by:

- Becoming a model environmental community in how it manages energy, air, water and waste;
- Leading by example by practicing environmental stewardship in City operations and facilities as guided through the Strategic Energy Action Plan (SEAP);
- Seeking and supporting collaborative and regional solutions to environmental problems; and
- Analyzing data and applying technologies to reach our environmental goals.

Charlotte Douglas International Airport: Vision for Sustainability

Charlotte Douglas International Airport (CLT) is committed to sustainability by pursuing fiscally responsible practices that minimize environmental impacts, while aligning with economic goals to achieve a sustainable enterprise for the benefit of our local community. The Aviation Department's Comprehensive Sustainability Plan aligns with the City's vision for sustainability and resilience as well as the Airport's Mission and Vision shown below:

CLT's Mission

We will serve as an economic engine of the Carolinas, facilitating the movement of people and goods, creating jobs and enterprise and sustaining a higher quality of life.

CLT's Vision

We will be the preferred airport and airline hub by providing the highest quality product for the lowest possible cost.

CLT's Vision for Sustainability

We will become a leader in environmental stewardship by maintaining a balanced, integrated approach to future development and operations based on economic stability, environmental sustainability, and social responsibility.

[1] https://charlottenc.gov/sustainability/Pages/default.aspx

1.3 GUIDING PRINCIPLES

CLT's Executive Team and Sustainability Steering Committee developed the guiding principles listed below. The principles correspond with the Airport's Vision and Mission and incorporate an element of sustainability in a way that aligns with CLT's organizational values.

1) **IMPACT**: Sustainability should be a core airport objective, with measurable targets, outcomes, and a mechanism for reporting.

2) **LEADERSHIP**: The Plan should position CLT as a leader in environmental, social, and economic sustainability, adhering to the "EONS" approach (see below).

3) **COLLABORATION**: The Plan should align with the City of Charlotte's sustainability objectives and be developed collaboratively with internal and external stakeholders.

4) **INTEGRATION**: Sustainability should be integrated into planning, design, construction, operations, and maintenance.

EONS Approach to Sustainability

Airports Council International North America pioneered the "EONS" definition of sustainability in the context of aviation by recognizing the need to incorporate operational efficiency into the traditional "triple bottom line" adopted by other industries. EONS defines sustainability as "a holistic approach to managing an airport so as to ensure the integrity of the **Economic Viability, Operational Efficiency, Natural Resource Conservation and Social Responsibility** of the airport.

The Aviation Department's Comprehensive Sustainability Plan aligns with the EONS approach, ensuring all goals and strategies support one or many of the four pillars of EONS.

Economic Viability
Operational Efficiency
Natural Resource Conservation
Social Responsibility

1.4 RESILIENCE

Resilience is the capacity of a community, business, building, or natural environment to avoid, withstand, respond to, and recover after a disruption.[2] Charlotte Douglas International Airport (CLT) comprises a network of assets including employees, the surrounding community, buildings, vehicles and other physical assets. Ensuring resilience in the face of short- and long-term disruptions, whether they be social, economic, or environmental, is critical for the Airport's long-term sustainability.

Climate change could potentially have a significant impact on operations at CLT if not addressed. Airports can work to mitigate the effects of climate change by developing comprehensive sustainability plans. An additional means of preparation could be to develop a complementary resiliency plan, identifying climate risks, vulnerabilities, and corresponding climate adaptation and resilience elements into both design and operations.

With an increase in the severity and number of storms, rainfall, and wind speeds among the changes expected, resilient operations will be increasingly essential. Protecting the Airport from these changes may help to mitigate the overall cost of damage, reduce failures in operations, and ensure the safety of customers and employees.

Implementing the strategies outlined in this report will allow the airport to build its ability to recover after an extreme and/or prolonged event such as a winter storm, heat wave or power outage. CLT aims for high levels of energy independence, which allows the Airport to respond more quickly after a disaster; saving time and money. This ability to resume operations translates into a reduced amount of time the airport would be forced to decrease its level of service in the aftermath of challenges.

According to 2017 ACI rankings, CLT is the sixth busiest airport in operations the United States and seventh in operations worldwide. Therefore, a slow down, or shut down, of operations would be detrimental to the region and National Airspace System. The halt of any level of service would impact the local and regional economy by limiting the movement of goods and services, as well as the ability for individuals to work.

Implementing sustainability strategies such as on-site renewable energy, community-connecting events, and supporting the health and wellbeing of passengers and employees will help the airport become more resilient in the face of the changing climate.

In each of the Focus Areas, there is a brief discussion of topic-specific resiliency considerations recommended for exploration by CLT.

[2] Adapted from U.S. Climate Resilience Toolkit. *Glossary*. https://toolkit.climate.gov/content/glossary

1.5 STRATEGIC ENERGY ACTION PLAN

In June 2018, the Sustainable and Resilient Charlotte by 2050 Resolution was unanimously passed by City Council. This resolution set aggressive and aspirational municipal and community-wide greenhouse gas emissions reduction goals for the City of Charlotte. Specifically, it strives to have City fleet and facilities be fueled by 100% zero-carbon sources by 2030. It also sets a community-wide goal for Charlotte to become a low carbon city by 2050 by reducing greenhouse gas emissions to below 2 tons of CO_2 equivalent per person annually. Lastly, it called for a strategic energy action plan to determine how Charlotte would reach the two goals. [3]

In December of 2018, City Council unanimously adopted the Strategic Energy Action Plan (SEAP). Sustainability staff developed the SEAP in partnership with community stakeholders and City departments participating in greenhouse gas emission reduction scenario sessions and continuous engagement on the specific areas of the SEAP. This resulted in a comprehensive framework of 11 linked Action Areas containing internal and external actions, focused on transportation, buildings, energy generation, and workforce development/equity with steps on how to reach the goals set by the resolution.[3]

The SEAP is an ambitious, aggressive action plan for delivering a low-carbon, resilient Charlotte. The City is responsible for leading its implementation and is committed to seeking all opportunities to achieving its goals, which will be dependent on many factors, including technological advancements, operational compatibility and risk management, and the availability of appropriate resources and funding. In addition, operational concerns and constraints may outweigh or not allow carbon reduction benefits[3]. As a City department, the Aviation Department aims to align pertinent components of its Comprehensive Sustainability Plan (CSP) with the Action Areas and objectives outlined in the SEAP.

SEAP Action Area 5: Strive Toward 100% Zero-Carbon Municipal Buildings by 2030	
Aviation Department CSP Strategies	**ENERGY & EMISSIONS- RENEWABLE AND LOW CARBON SUPPLY** EE1 Increase onsite renewable energy EE2 Assess feasibility of central energy plant with low carbon energy supply EE3 Purchase renewable energy credits or other offsite renewable supply EE4 Pursue ACI Carbon Accreditation **ENERGY & EMISSIONS- OPERATIONS AND MAINTENANCE** EE5 Use automated "smart" HVAC and lighting controls EE6 Track energy use through monitoring and sub-metering EE7 Explore feasibility and impact of green roofs

[3] https://charlottenc.gov/sustainability/seap/Pages/default.aspx

SEAP Action Area 6: Strive Toward 100% Zero-Carbon City Fleet by 2030

Aviation Department CSP Strategies

HEALTH: AIR QUALITY

H6 Introduce non-idling policy

ENERGY & EMISSIONS- RENEWABLE AND LOW CARBON SUPPLY

EE4 Pursue ACI Carbon Accreditation

ENERGY & EMISSIONS-FLEET AND VEHICLES

EE8 Develop unified fleet strategy
EE9 Explore feasibility of electric shuttle bus fleet
EE10 Provide vehicle charging infrastructure at all parking facilities
EE11 Continue to work with airlines to convert GSE to electric
EE12 Develop a sustainable logistics delivery policy

SEAP Action Area 8: Facilitate Rapid Uptake of Sustainable Modes of Transportation

Aviation Department CSP Strategies

TRANSPORTATION- EMPLOYEE COMMUTE

T1 Survey employee commute
T2 Expand ride share programs with incentives
T3 Improve cycling and pedestrian access to CLT

TRANSPORTATION- REGIONAL TRANSPORTATION

T4 Serve as an advocate in regional transportation planning

2. PLAN DEVELOPMENT PROCESS

The Aviation Department's Comprehensive Sustainability Plan was developed in a phased approach involving the following steps:

1. **Stakeholder Identification:** The team developed a list of stakeholders, including those internal to airport operations, as well as external parties from the community who have an interest in CLT's sustainability performance. The result was the formation of the internal Sustainability Steering Committee and an external stakeholder list. The approach to engagement of each group is detailed in the Strategic Stakeholder Engagement Plan (Section 2.1).

2. **Measuring the Baseline:** The consultant team aggregated all available data and information about CLT's "current state" to create a baseline from which to set targets. This entailed a review of resource consumption and waste generation, a review of existing policies, programs, and standards, and developing an inventory of past and current initiatives at CLT to improve efficiency and sustainability performance.

3. **Sustainability Vision:** With an understanding of CLT's current state of sustainability performance, the internal Sustainability Steering Committee met to discuss and develop a Sustainability Vision for CLT. By looking at the broad range of potential Focus Areas for the Plan and ranking each area in terms of importance, the Plan's "Focus Areas" were identified.

4. **Target Setting**: Based on baseline data collection, the Sustainability Vision, and informed by best practices from other airports, the Sustainability Steering Committee with input from the consultant team developed a set of sustainability performance targets – quantifiable targets in each Focus Area to be achieved by 2030. It should be noted that some targets may have a different baseline and/or target date to achieve the goal, depending on available data or alignment with other City initiatives.

5. **Strategy Development**: CLT hosted a workshop with the Sustainability Steering Committee, and a focus group and online survey for external stakeholders. The purpose of this set of engagement activities was for the stakeholders to contribute ideas for how CLT could achieve each of the targets in the Focus Areas. In aggregate, the internal and external stakeholder groups contributed an extensive list of potential sustainability strategies.

6. **Impact and Cost Analysis**: The consultant team combined the list of proposed strategies and refined it into a set of consolidated actions that align with the Plan's goals and targets. The next step was to determine the potential cost, level of effort and impact of each strategy. This included life-cycle costing (LCC) of relevant strategies to calculate LCC and return on investment (ROI).

7. **Implementation Details**: The consultant team reviewed each of the proposed strategies with CLT employees who are dedicated specialists in each respective action area. The purpose of this review was to determine practicality and feasibility, to identify individuals or divisions responsible for carrying out the actions, and initial implementation steps.

8. **Stakeholder Review and Finalization**: CLT hosted Open House events for the internal and external stakeholders to review the proposed set of strategies, overall plan structure, and to provide feedback. The consultant team reviewed and incorporated the stakeholder feedback into the final plan.

Figure 1: The process of developing the Plan, framed by internal and external stakeholder input.

2.1 STAKEHOLDER ENGAGEMENT

The internal Sustainability Steering Committee and external stakeholder group contributed to the development of the structure, Focus Areas and strategies in the Plan. The Plan is comprehensive in nature, and is aligned with the EONS definition of sustainability, which addresses economic viability, operational efficiency, natural resource conservation, and social responsibility. To ensure that all elements of sustainability would be represented in the Plan, the list of invited stakeholders included individuals with expertise in each represented Focus Area. Stakeholder activities included meetings, workshops, focus groups, surveys, and open houses.

The external stakeholders were engaged at two key stages of the planning process: (a) initially, for 'ideas generation' to develop a list of sustainability strategies for CLT to consider and (b) at the draft plan stage, to review and provide feedback on the plan's structure and proposed strategies.

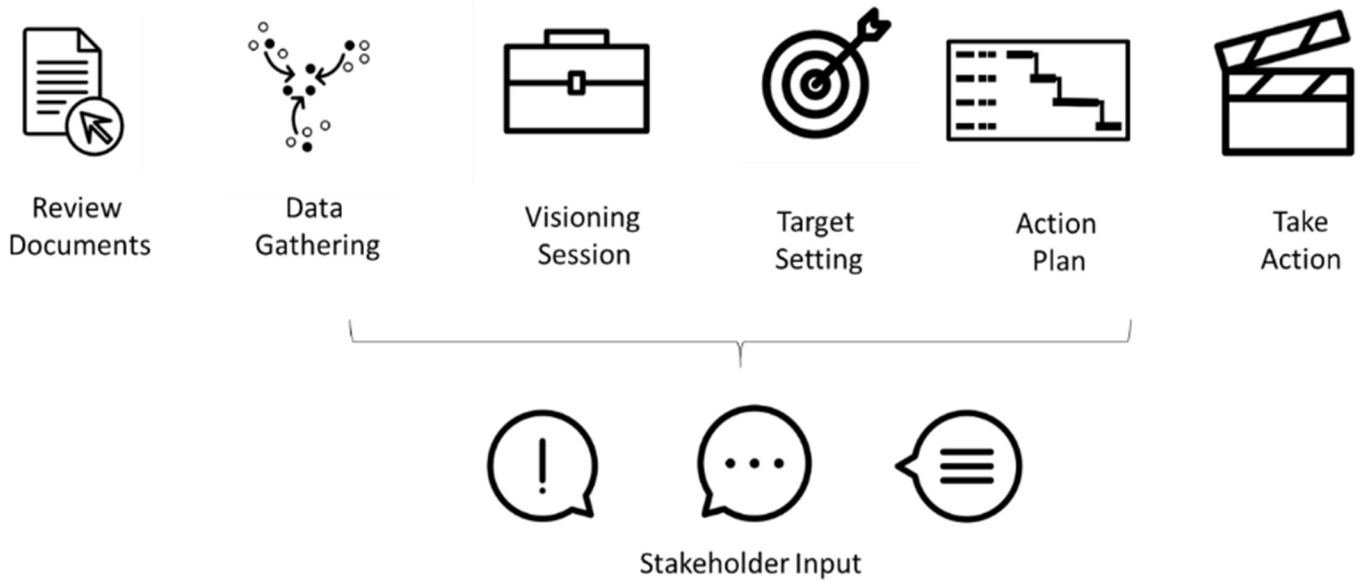


Figure 2: Stakeholder input was gathered at all stages of plan development.

INTERNAL STAKEHOLDERS

CLT Sustainability Steering Committee

Mark Wiebke	Planning Director
Lauren Scott	Planning and Environmental Manager
Jimmy Jordan	Environmental Manager
Alicia Barone	Energy Sustainability Coordinator
Amber Leathers	Senior Airport Planner
JC Weaver	NEPA Specialist
Jeff McSwain	Development Director
Chris Hazen	Facilities Maintenance Director
Scott Kincaid	Fleet Maintenance Manager
Chad Huskins	Field Maintenance Manager
Mike Pridgen	Building Maintenance Manager
Mickey Edwards	Project Coordinator
Kevin Lynch	Facilities Services Manager
Ted Kaplan	Business and Revenue Director
Stuart Hair	Economic and Community Affairs Director
Martha Edge	Innovation and Experience Director
Diane Carter	Commercial Services & Properties Manager
Chris Garnett	Airline Affairs Manager
Donovan Jones	Business Relationship Manager
Jennifer Long	Terminal Concessions & Services Manager
Rebecca Connelly	Economic & Community Affairs Manager
Kevin Hennessey	Real Estate & Noise Manager
Jimmy Mynatt	Airport Operations Director
Valerie Boston	Landside Operations Manager
Dave Edwards	Airside Operations Manager
Tashiek Lescott	Procurement & Construction Contracts Manager
Jerry Schwinghammer	Business Continuity Manager
Ted Cisine	Special Assignments
Marcus Mitchell	Program Director, Public Art

CLT Executive Team

Brent Cagle	Aviation Director
Jack Christine	Chief Operating Officer
Haley Gentry	Chief Business & Innovation Officer
Mike Hill	Chief Financial Officer
Leila Lahbabi	Lead Counsel
Lee Davis	Communications Director
Babette Boone	Administrative Services Manager

EXTERNAL STAKEHOLDERS

Below is a list of external stakeholders invited to contribute ideas and feedback throughout the development of the Plan. These stakeholders include entities that have a business relationship or interest in the Airport, are local business leaders, experts in sustainability, or are representatives from local government agencies. Stakeholder input was solicited through surveys, workshops, focus groups and in-person and phone interviews.

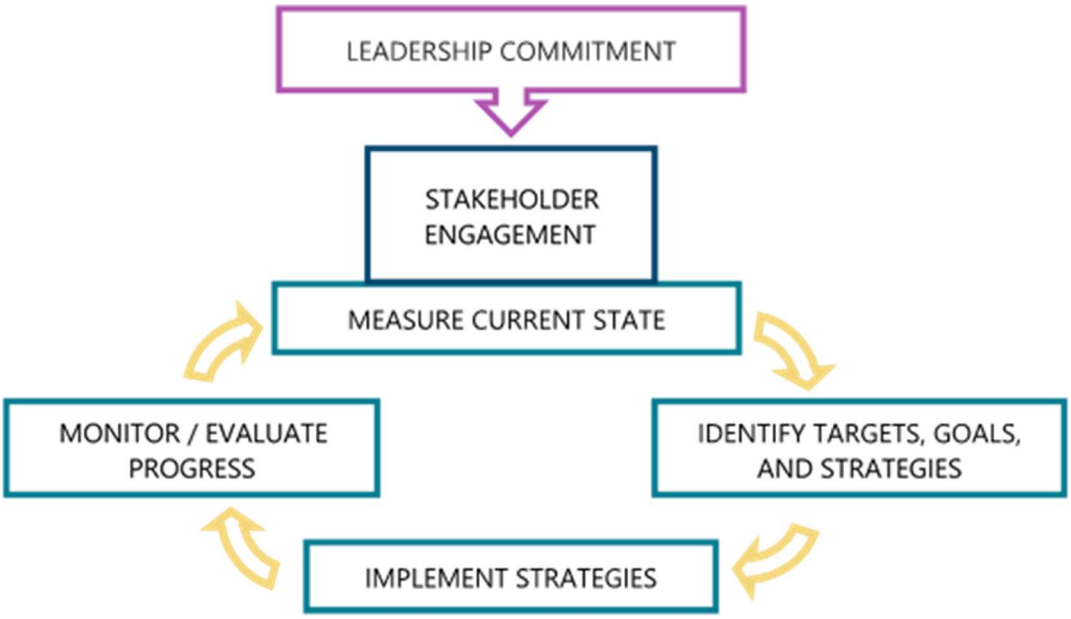
American Airlines
Atrium Health (formerly Carolinas HealthCare System)
Bank of America
Blumenthal Foundation
Coldwell Banker
Catawba Lands Conservancy
Catawba Riverkeeper
CATS / City of Charlotte
Centralina COG
Charlotte Center City Partners
Charlotte Chamber of Commerce
Charlotte Mecklenburg Schools
Charlotte Regional Partnership
Choateco
City of Belmont Sustainability
City of Gastonia Economic Development
Clean Air Carolina
Crescent Communities
Denard, Inc.
Discovery Place
Domtar
Duke Energy
Envision Charlotte
Ernst & Young
Foundation for the Carolinas
Gastonia Economic Development Corporation
Goodwill Industries of Southern Piedmont
Gresham Smith
Habitat for Humanity Charlotte
HMS Host
JetStream
JLL
Lincoln Harris
Lowes
Mecklenburg County, Sustainability
Montcross Area Chamber of Commerce
National Gypsum
Norfolk Southern
Old Castle
Paradies
Piedmont Natural Gas
Prospect Airport Services
Renaissance West Community Initiative
Sealed Air
Seenova
Sustain Charlotte
Trees Charlotte
UNC Charlotte
UPS
USGBC
Waste Management
Wells Fargo
Wilson Air Center - Charlotte

3. IMPLEMENTATION AND GOVERNANCE

To ensure that CLT is prepared to deliver upon the proposed strategies and meet the goals and targets outlined in this Plan, each strategy includes relevant implementation details. These include identification of the party or parties responsible for implementation, the estimated timeframe, relative level of investment, and initial steps.

Implementation of the Plan is a dynamic process, which will be undertaken through to 2030. Therefore, it will go through periods of review and refinement over time and is intended to be a living document. The diagram below represents the cyclical nature of plan implementation, which includes ongoing action, leadership commitment and stakeholder engagement. As the impact of each strategy is measured every 1-3 years, responsible parties will have the opportunity to revisit targets and implementation details to ensure strategies are providing the projected return on investment in terms of financial, environmental and social impact.

It is recommended that CLT establish a Plan Implementation Committee that will be responsible for overseeing the implementation of the Plan over time. The parties responsible for implementing each strategy should report to the Plan Implementation Committee on a biannual basis. The Plan Implementation Committee should meet annually to evaluate progress, to assess the impact of Plan implementation, and make changes to staffing or specific approaches to implementation as needed.



3.1 EDUCATION AND TRAINING

Education

To increase the impact of the strategies included in this Plan and improve the Airport's capacity to meet its goals and targets, education is of central importance. Strategy CEE3 in the Community, Equity and Economic Development Focus Area recommends sustainability and diversity training for all employees. This means ensuring that all employees are aware of the vision, goals and targets of this Plan, and the importance of improving sustainability performance across the Airport's operations.

The Airport should also consider engaging passengers and the local community around its commitment to sustainability. This can be done by way of CLT's website, newsletters and social media, and through passenger-facing information and campaigns. CLT's adoption of a culture of sustainability should be transparent and visible, and encourage employees, passengers, and the local community to do their part to support CLT's vision.

Training

CLT's ability to deliver on many of the strategies in this Plan will require training of operations and maintenance personnel, particularly for the Energy, Water, and Waste Focus Areas. CLT should provide support for operators, mechanics, and facilities personnel to make energy, water and resource-saving decisions daily.

The following steps are recommended:

- ✓ Energy conservation training as part of employee development, and require training for key personnel
- ✓ Develop content for new training module(s); specifically, to cover any new airport policies, new content in airport design guidelines, and any new systems, technology, processes or upgrades.
- ✓ Identify personnel who require training, which may include; operations and maintenance staff, facility staff, project coordinators, Development Department project managers, IT Department project managers, members of IMA/TMA review committee, and sub-contractors.
- ✓ Deploy online training module(s).

4. PLAN STRUCTURE

GUIDING PRINCIPLES

The principles of this Plan – impact, leadership, collaboration, integration - act as overarching guidelines, which directed the development of the subsequent components of the Plan, including the Focus Areas, goals, targets, and actions. They ensure components of the Plan are in alignment with CLT'S Vision and Mission and the organizational values of CLT, as demonstrated in Figure 3 below.

FOCUS AREAS

A set of six Focus Areas comprise the structure of the Plan. These Focus Areas address sustainability performance areas and correspond with different facets of airport operations. The categories are used to organize the goals, targets, and strategies into defined groupings.

GOALS

Each Focus Area contains a set of high-level directional goals, which are used to articulate a desired future state in terms of improving sustainability performance in each Focus Area.

TARGETS

There are one or more quantifiable performance targets associated with each goal. Targets allow the Airport to continually measure performance using quantitative measures. While goals are general statements of intent, targets specify the quantifiable values to achieve the intended future conditions defined within the goal.

STRATEGIES

The main body of this Plan consists of a set of recommended strategies for CLT to implement in order to achieve its targets and goals by 2030. Each recommended strategy is presented in detail in the Plan, including the projected costs and implementation details that are necessary to achieve the specified levels of performance.

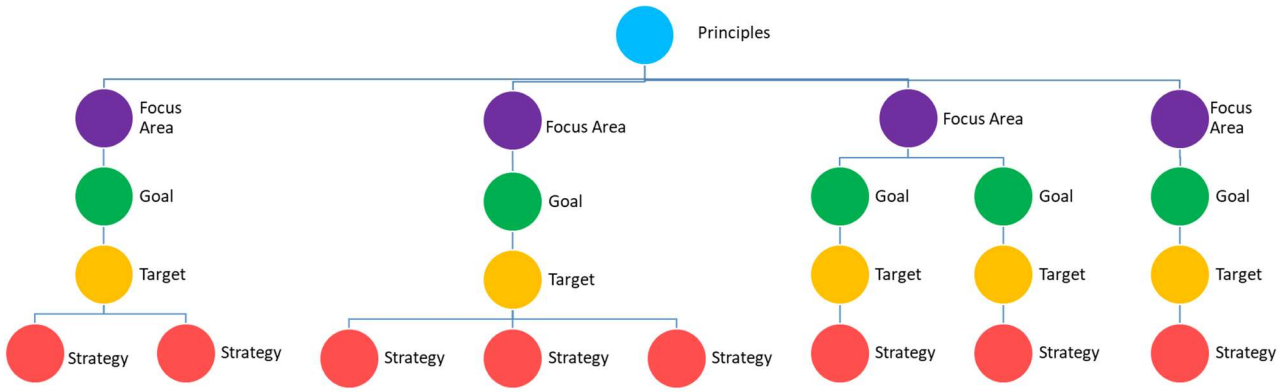


Figure 3: Plan Structure

4.1 FOCUS AREAS AND GOALS

WASTE

Goals

- ✓ Increase waste diversion rate
- ✓ Minimize food waste disposal
- ✓ Reduce waste generation

HEALTH

Goals

- ✓ Support employee, tenant, and passenger health
- ✓ Design spaces to enhance passenger comfort and health

ENERGY + EMISSIONS

Goals

- ✓ Reduce energy use and emissions from airport operations
- ✓ Increase renewable energy supply
- ✓ Increase use of alternative fuel vehicles

COMMUNITY, EQUITY + ECONOMIC DEVELOPMENT

Goals

- ✓ Increase awareness of diversity, equity and inclusion policies
- ✓ Demonstrate commitment to local community capacity building
- ✓ Support employee professional and personal development

WATER, STORMWATER + LANDSCAPE

Goals

- ✓ Improve stormwater capture, treatment, and reuse
- ✓ Reduce per passenger water use
- ✓ Improve water quality and reduce impact of landscapes

TRANSPORTATION

Goals

- ✓ Reduce single-occupancy vehicle use and increase sustainable modes of transportation
- ✓ Increase alternative fueling infrastructure
- ✓ Reduce congestion and idling

5. FOCUS AREA STRATEGIES

The following section provides the detailed set of recommended strategies, organized by Focus Area.

WASTE

Image 1: More than 85 smart waste and recycling stations have been installed throughout the Atrium and on each concourse.

Image 2: The Airport routinely recycles concrete and asphalt on-site during construction. Stored materials are reused in future Airport roadways, taxiways and airfield maintenance projects.

5.1 WASTE

OVERVIEW

With more than 125,000 passengers served at CLT daily, there is a high volume of waste generated throughout the Airport's operations, including food and packaging waste, airline waste, and construction and demolition waste as the terminals continue to be renovated and expanded. Understanding the volume and composition of the waste stream will be critical in understanding how to improve waste management practices and increase diversion from the landfill. A central focus of the effort to reduce waste will be to educate employees, vendors and passengers around waste management best practices. There is an opportunity to reduce the volume of waste generated and to shift the waste stream toward increased diversion, maximizing reuse, recovery and recycling over disposal.

GOALS
Increase waste diversion
Minimize food waste disposal
Reduce waste generation
TARGETS
75% Diversion rate from all CLT-controlled operations
Zero food waste to landfill (back of house)
10% Reduction in total waste volume

WASTE: RECOMMENDED STRATEGIES

GENERAL WASTE MANAGEMENT

- W1 Conduct waste composition study
- W2 Formalize waste reduction program and track progress
- W3 Pursue zero waste certification

FOOD WASTE

- W4 Participate in EPA food recovery challenge
- W5 Vendors: Increase food recovery/donation
- W6 Phase in organics composting

CONCESSIONS

- W7 Introduce waste management policy for concessionaires
- W8 Educate vendors, staff, and passengers
- W9 Reduce single use disposable items

CONSTRUCTION WASTE

- W10 Increase and track construction waste diversion

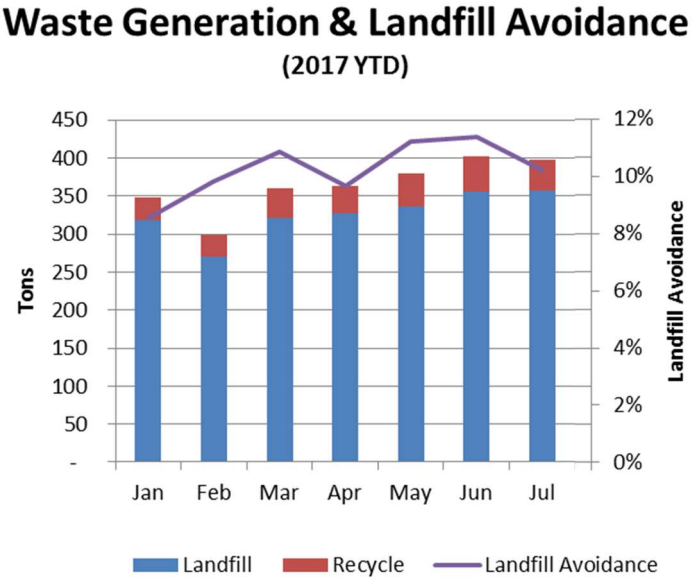
AIRLINE WASTE

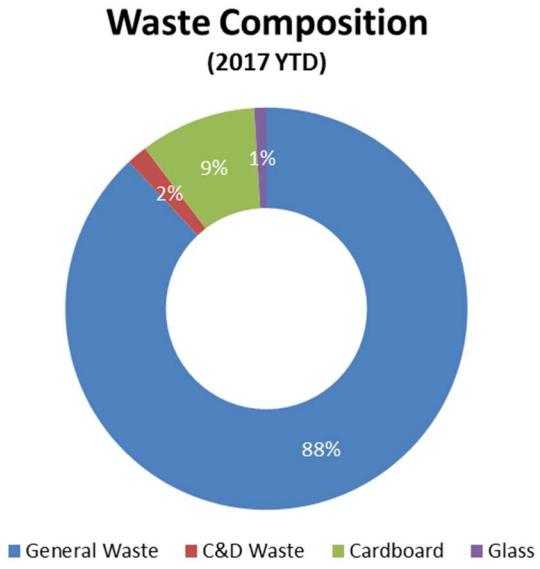
- W11 Improve diversion of waste from flights

WASTE: BASELINE DATA SUMMARY

CURRENT AND PREVIOUS[4] ACTIONS

- ✓ Big Belly waste compactors are placed throughout the terminal
- ✓ Corrugated cardboard and glass are separated for recycling
- ✓ The Airport recycles concrete and asphalt on-site during construction and development
- ✓ Incentivized double-sided printing, with printing costs implemented per sheet
- ✓ Over 30 water bottle filling stations installed since 2012





[4] CLT developed a 27,000-square-foot recycling center in 2012 to process 10,000 tons of waste and capture all recycling. This facility is no longer in use, and waste and recycling are processed off-site.

W1 Conduct a waste composition study

GOALS SUPPORTED
Increase waste diversion rate
Minimize food waste disposal
Reduce waste generation
TARGETS SUPPORTED
75% Diversion rate from all operations
Zero food waste to landfill (back of house)
10% Reduction in total waste volume

A waste composition study will provide data to inform waste management practices across the Airport. The study will take representative samples from the main sources of waste at CLT (e.g. passenger areas, food vendor pre-consumer and post-consumer, office areas, and airline areas). It will also determine volumes by type and potential destination including composting, recycling, and landfill. The findings of the study can be used to identify opportunities for improved diversion or waste reduction, and potential markets for different materials. Furthermore, data collected can be used as a baseline for comparison to measure future waste generation volumes and diversion rates against as materials and waste management practices evolve over time.

COSTS
Inexpensive **($50,000 or less)**
IMPLEMENTATION
Timeline: Short (year 1)

Documents to update/create:
- *Develop a Waste Composition Study Report*
- *Develop a tracker for results*

Implementation

Steps:
- ✓ Prepare request for proposals and/or scope of work for waste consultants
- ✓ Evaluate proposal(s); hire contractor
- ✓ Perform waste sort, review analysis report

** Study should be repeated on a periodic basis, about every five years, to evaluate the effectiveness of waste diversion actions. If substantial changes in airport operations occur, the study may need to be updated more frequently to understand the implications of these changes to waste management practices and waste composition.*

Metrics:
- Waste generation rates (tons)
- Waste diversion rates (%)
- Waste composition (%)

Responsible Parties
Facilities Services Manager
Energy Sustainability Coordinator

Special Considerations
The challenge will be determining and obtaining representative samples from diverse areas of CLT.

W2 Formalize waste reduction program and track progress

GOALS SUPPORTED
Increase waste diversion rate
Minimize food waste disposal
Reduce waste generation
TARGETS SUPPORTED
75% Diversion rate from all operations
Zero food waste to landfill (back of house)

Based on the results of the waste composition study, CLT will develop a waste management program or policy, to formalize an approach to reducing waste generation and improving diversion across all Airport operations. This plan will include implementing a process for tracking the impact of waste management initiatives, including a reduction in volume of waste generation, and improved diversion of landfill waste. A Zero Waste Plan or other type of waste management plan may be developed, which outlines current policies, results of the waste composition study, waste initiatives, and tracking plans. The Plan should consider the full range of waste streams including hazardous waste, e-waste, and food waste from all areas of operations.

COSTS
Inexpensive **($50,000 or less)**
IMPLEMENTATION
Timeline: Mid (year 2-3)

Documents to update/create:
- *Develop waste management policy, program, or plan*
- *Develop tracking and reporting documentation*

Implementation

Steps:
- ✓ Meet with stakeholders, share waste composition study results, inventory existing and ongoing initiatives; brainstorm ideas and gather input for Waste Management Plan
- ✓ Write plan (or hire consultant), invite stakeholders for input on draft
- ✓ Finalize plan, implement tracking program

**Initiative examples: Big Belly compactors, water bottle refill stations, and food donations.*

Metrics:
- Waste generation rates (tons)
- Waste diversion rates (%)
- Data on impact of each initiative

Responsible Parties
Facilities Services Manager
Energy Sustainability Coordinator

Special Considerations
This strategy will be best executed if supported by key stakeholders who understand the Airport's operations, and with a consistent and concerted effort to document the impact of waste reduction initiatives.

W3 Pursue a third-party zero waste certification

GOALS SUPPORTED
Increase waste diversion rate
Minimize food waste disposal
Reduce waste generation
TARGETS SUPPORTED
75% Diversion rate from all operations
Zero food waste to landfill (back of house)
10% Reduction in total waste volume

Best practice waste management approaches can be implemented and monitored using established certification standards. CLT should explore third-party zero waste certification programs, such as TRUE Zero Waste[5] Certification or UL Environment's waste diversion validation program.[6] A preliminary action would be to identify certification programs, and assess available standards for impact, cost and feasibility.

TRUE Zero Waste certification requires facilities to meet 7 minimum program requirements plus other credits, tracked on a scorecard. Minimum requirements include having a zero-waste policy in place and an average of 90% or greater overall diversion from landfill, incineration (waste-to-energy) and the environment for solid, non-hazardous wastes for the most recent 12 months. To maintain certification, waste diversion data must be submitted annually.

UL Environment offers a waste diversion validation program, which includes a zero waste level, designed to provide validation and credibility to a company's diversion efforts. Although not a requirement for working with UL Environment, the hauler currently contracted with the Airport, Waste Management (WM), has collaborated with UL Environment so that it can efficiently assist clients with documentation by providing support data, including material inventory, material reuse, and landfill recovery.

Documents to update/create:
- *Zero waste policy*

COSTS
Inexpensive **($50,000 or less)**
IMPLEMENTATION
Timeline: Long (year 3+)

Notes:
- *Registration Fee of $1,200-$1,500 plus a TBD certification fee based on square footage*

Implementation

Steps:
- ✓ Evaluate requirements of each program and determine which zero waste certification is best for CLT
- ✓ Implementation steps vary based on selected rating system; refer to program requirements

Metrics:
- Average non-hazardous waste materials
- Destination facilities for each waste stream

Responsible Parties

Energy Sustainability Coordinator
Facilities Services Manager

Special Considerations

Successful implementation will require ongoing and accurate tracking systems plus the implementation of additional waste reduction programs. Achieving zero waste also supports the Airport's commitment to reducing the overall carbon footprint.

[5] https://true.gbci.org/

[6] https://industries.ul.com/environment/zero-waste

W4 Participate in the EPA Food Recovery Challenge

GOALS SUPPORTED
Minimize food waste disposal
Reduce waste generation
TARGETS SUPPORTED
75% Diversion rate from all operations
Zero food waste to landfill (back of house)

The EPA Food Recovery Challenge,[7] part of the EPA's Sustainable Materials Management Program (SMM), is a voluntary program that is customizable for any organization. Participating organizations prevent and divert uneaten food generated by their operations, following the Food Recovery Hierarchy (prevention, donation, composting and/or anaerobic digestion). Participation in this program is free. The program includes access to a database that generates a climate profile (greenhouse gas equivalencies report), as well as tracking information for goals and dates. Information is entered annually, and the EPA provides free technical assistance.

COSTS
Inexpensive **($50,000 or less)**
IMPLEMENTATION
Timeline: Short (year 1)

Documents to update/create:

- *Vendor agreements (potential)*
- *Waste hauler agreements (potential)*

Implementation

Steps:

- ✓ Begin baseline data collection with most current waste characterization study (1 year)
- ✓ Baseline data must be entered and submitted through the SMM Data Management System within 90 days of registering for the Challenge
- ✓ Potentially align with any changes to waste receptacles and education/outreach

Metrics:

- EPA tools
- Tons of food waste diverted (tons)

Responsible Parties

Facilities Services Manager
Energy Sustainability Coordinator

Special Considerations

The Airport will have to designate appropriate areas and destinations for food waste donations and waste.

W1 must be implemented as a precondition to W4

[7] https://www.epa.gov/sustainable-management-food/food-recovery-challenge-frc

W5 Vendors: Increase food recovery/donation

GOALS SUPPORTED
Minimize food waste disposal
Reduce waste generation
TARGETS SUPPORTED
75% Diversion rate from all operations
Zero food waste to landfill (back of house)

It is recommended that the Airport increase food recovery efforts among its vendors to help eliminate disposal of surplus food and seek to develop partnerships with local food banks, or other organizations that accept surplus food that meets donation requirements. HMS currently has a food donation program in place, so these steps would be used to expand the program and find additional recipients if needed. The existing food donation initiative is limited to Grab & Go food items. According to HMS Host's analysis, approximately 60% of eligible food is currently donated. HMS intends to expand to restaurants in the future, donating pizza, pasta, etc. The current barrier to donating all eligible food is the limited space at the dock for storage and pickup. The new Central Receiving and Distribution Center (CRDC) facility will reduce barriers to food donation and should facilitate the achievement of the Zero Food Waste to Landfill target.

COSTS
Inexpensive **($50,000 or less)**
IMPLEMENTATION
Timeline: Mid (year 2-3)

Documents to update/create:

- *Future vendor contracts*

Implementation

Steps:

- ✓ Identify additional organizations that accept the donations and develop partnerships based on community benefit and ease of implementation
- ✓ Research applicable State and local public health regulations for food donations
- ✓ Create an informational/best practice guide for vendors
- ✓ Voluntary food recovery/donations should continue to the maximum extent possible
- ✓ Update contract language to reflect increased donation target
- ✓ Once the CRDC is completed, the goal should be donating 100% of eligible items

Metrics:

- Food recovered (lbs/tons)
- Food donated (lbs/tons)

Responsible Parties

HMS Director of Operations
Terminal Concessions Manager
Energy Sustainability Coordinator

Special Considerations

Dock space, which will be improved with the construction of the new CRDC; following regulations and best practices for food donation; additional vendor labor for collecting donations and tracking.

W6 Phase in organics composting

GOALS SUPPORTED
Increase waste diversion rate
Minimize food waste disposal
TARGETS SUPPORTED
75% Diversion rate from all operations
Zero food waste to landfill (back of house)

Using a phased approach, introduce an organic composting program to divert food and other organic waste from landfill disposal. The industry-recognized 'food waste management hierarchy'[8] identifies composting as the third-best approach to the management of food waste, after prevention and donation. A phased organic waste composting program should begin with vendors in the back-of-house (BOH), before being extended to front-of-house (FOH) in public and passenger-facing areas of CLT. In BOH, this will entail sorting and collecting pre-consumer food waste in commercial kitchens. In FOH, this will require adding receptacles for organic material to waste and recycling receptacles in areas used by passengers and airline/airport offices, as well as the necessary signage, engagement and education.

COSTS
Inexpensive **($50,000 or less) – does not include composting contract**
IMPLEMENTATION
Timeline: Mid (year 2-3)

Documents to update/create:
- *Janitorial policies*

Implementation

Steps:
- ✓ Pilot project could begin as soon as hauler/processor for organic waste is chosen and service is in place. BOH is recommended as the first step.
- ✓ Initial phase would add receptacles for organic material in one pilot study food vendor area
- ✓ Rollout to all food vendor areas
- ✓ Expand to post-consumer staff areas (e.g., offices, breakrooms, etc.)
- ✓ Once organic waste collection is established for the regular staff, it will be easier to extend to FOH
- ✓ Final phase would add receptacles for organic material at all points where trash and recycling receptacles are provided in the Airport

Metrics:
- Organic waste generation rate (tons)
- Organic waste diversion rate (%)

Responsible Parties

Facilities Services Manager

Special Considerations

This action will be more easily implemented once the CRDC is operational. The Airport will need to consider dock space as this strategy will require adequate space to be successful.

[8] https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy

W7 Introduce waste management policy for concessionaires

GOALS SUPPORTED
Increase waste diversion rate
Minimize food waste disposal
Reduce waste generation
TARGETS SUPPORTED
75% Diversion rate from all operations
Zero food waste to landfill

COSTS
***Inexpensive* ($50,000 or less)**
IMPLEMENTATION
Timeline for Developing Best Practices: Short (year 1) **Timeline for New Requirements: Long (year 3+)**

Develop a set of best practices and requirements for concessionaires focused on source reduction, environmentally responsible purchasing, and waste capture and diversion. Any policy changes would ultimately be the decision of airport executives, legal team and food vendors. New policy requirements would need to be phased in to give concessionaires time to implement successfully. Potential policies would include recommendations or requirements for purchasing decisions that would simplify waste streams, focusing on phasing out materials (particularly for take-out options) that are difficult to recycle or compost, or that create unnecessary waste (e.g., Styrofoam, multi-layered packaging). Additional new policies may include employee incentives for participation and good performance in waste diversion programs and the continuing the existing practice of collecting cooking oil to send to a third-party vendor to be used for biodiesel. Eventually, policies could include recommendations and requirements that affect front-of-house/ customers. Successful policies could be added to Concessionaires' contracts when up for renewal, or to new Concessionaires as they are added. Future targeted waste audits could be performed to isolate back-of-house (BOH) materials to evaluate vendor participation and performance.

Documents to update/create:
- *Concessionaires contracts*

Implementation

Steps:
- ✓ Define concessionaires waste system, opportunities for source reduction, environmentally responsible purchasing, and opportunities to capture more materials for diversion at all waste generation points
- ✓ Confirm baseline from waste audit
- ✓ Confirm hauler/market plan for future diverted materials (e.g., establish organic waste hauler and processer)
- ✓ Create draft policy to encourage concessionaire participation
- ✓ Continue monitoring participation and diversion success rates, re-evaluate and amend policies as necessary
- ✓ In the long term, successful policies should become mandatory for all contracts

Metrics:
- Waste generation rates (tons)
- Incentive/Performance tracking (% improved/lbs/tons improved)

Responsible Parties

Commercial Services & Properties Manager
Food Vendor Director of Operations

Special Considerations

Approval from highest levels of HMS, airport executives and legal. Policies will need to allow Concessionaires to still run successful business models and sanitary operations.

W8 Educate vendors, staff, and customers

GOALS SUPPORTED
Increase waste diversion rate
Minimize food waste disposal
Reduce waste generation
TARGETS SUPPORTED
75% Diversion rate from all operations
Zero food waste to landfill
10% reduction in total waste volume

Implementing new waste reduction and diversion programs and increasing the efficiency of existing ones will require educating vendors, staff, and customers. For front-of-house (FOH), this education/outreach could include signage and advertisements to passengers via point of disposal, airport website and social media, and press releases. Other elements to include in education programs are receptacles (trash, recycling, composting) that are effectively located, clearly labeled, and highly visible. For back-of-house (BOH), this education/outreach could include training for staff, vendors, and all airline staff.

COSTS
Inexpensive **($50,000 or less)**
IMPLEMENTATION
Timeline: Short (year 1)

Documents to update/create:
- *Concessionaires contracts*

Implementation

Steps:

- ✓ Review results of waste composition study (when complete) to identify areas of greatest concern (highest contamination, lowest diversion, etc.)
- ✓ Work with solid waste hauler, vendors, and staff to develop appropriate educational materials
- ✓ Roll out to general public, staff and vendors
- ✓ Evaluate effectiveness through review of the next waste audit
- ✓ Gather feedback from vendors, staff, and passengers through surveys and other methods

Metrics:

- Waste generation rates (tons)
- Waste diversion rates (%)
- Target audience feedback

Responsible Parties

Facilities Services Manager
CLT and HMS partnership

Special Considerations

Behavior change is a common challenge when introducing new waste management practices, particularly when customers are transient, as in an airport environment.

W1 must be implemented as a precondition to W8

W9 Reduce single-use disposable items

GOALS SUPPORTED
Reduce waste generation
TARGETS SUPPORTED
10% reduction in total waste volume

Replace single-use items sold or otherwise distributed at the Airport with reusable, recyclable, or compostable products. This would likely be included in the new policy for Concessionaires/ Vendors but may simply be the creation of a Best Practices document to share with airport Concessionaires/Vendors. Any grants or other incentives to replace single-use items with reusable, recyclable, or compostable products would be also be included. Planning strategies to incentivize dining-in and/or reducing take-out waste (estimated 60% of transactions are takeout according to HMS) could be included in plans for future expansions and renovations of concessions areas. Bioplastics will not be included for the foreseeable future, unless a third-party organic waste contractor accepts them. HMS is currently phasing out plastic straws by 2020.[9]

COSTS
Inexpensive **($50,000 or less)**
IMPLEMENTATION
Timeline: Short (year 1)

Documents to update/create:

- *Concessionaires and vendor policies*

Implementation

Steps:

- ✓ Assess portion of waste stream that is comprised of single-use, non-recyclable, non-biodegradable items
- ✓ With stakeholder input, identify best practices and target areas for improvement
- ✓ Eventually add best practices to future contracts and policies

Metrics:

- Waste generation rates (tons)
- Waste diversion rates (%)

Responsible Parties

HMS
Concessions
Tenants

Special Considerations

Use waste composition study and purchasing information from concessionaires/vendors to assess waste stream.

The Liquor License Recycling Policy for glass is currently causing issues due to lack of glass recyclers and/or commodity markets locally. Also, the recycling market is having issues with contamination and plastics.

[9] https://www.hmshost.com/news/details/hmshost-will-eliminate-plastic-straws-by-2020

W10 Increase construction and demolition waste diversion

GOALS SUPPORTED
Increase waste diversion rate
TARGETS SUPPORTED
75% Diversion rate from all operations

Increase the amount of construction waste from airport projects diverted from disposal in the landfill, by requiring that all future construction projects have a minimum diversion rate. A minimum waste diversion requirement would need to be established for future construction and demolition projects and would ultimately be the decision of airport executives and the legal team considering input from construction teams Best management practices could be compiled as part of policy development, to determine the implementation details. Construction and demolition waste processors in the area would need to be identified, along with markets to evaluate cost effectiveness.

This strategy can be implemented immediately and independent of other actions. Currently, asphalt and concrete demolition materials are crushed on-site and reused for projects. However, the tracking system for this is not comprehensive. Future construction projects pursuing Green Globes certification will require 75% diversion of construction and demolition (C&D) waste to the achieve the highest score within the Green Globes criterion.

COSTS
Expensive **($10M estimate)**
IMPLEMENTATION
Short (year 1)

Documents to update/create:

- *Construction and demolition contracts*

Implementation

Steps:

- ✓ Collect baseline data based on recent construction projects at the Airport.
- ✓ Choose a new goal level of diversion and create phased plan of higher diversion requirements.
- ✓ Draft new policy for future construction projects with input from stakeholders and decision makers.
- ✓ Finalize and implement policy.

Metrics:

- Waste generation Rates (tons)
- Waste diversion Rates (%)

Responsible Parties

Airport Engineer / Engineering Program Managers

Aligns with:

- ✓ Green Globes

W11 Improve diversion of waste from flights

GOALS SUPPORTED
Increase waste diversion rate
TARGETS SUPPORTED
75% Diversion rate from all operations

Airport staff should work with airlines and aircraft service and ground handling companies to improve diversion rate of waste from flights. Because each airline can have separate operating procedures that affect waste management on board and on the ground, the Airport will need to evaluate where it can be effective in supporting airline waste diversion initiatives.

COSTS
Inexpensive **($50,000 or less)**
IMPLEMENTATION
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Develop partnership with airlines to address waste management targets
- ✓ Begin by gaining an understanding of the waste management practices of all airlines to better determine how to support them in increasing waste diversion from their flights.
- ✓ Collaborate with all stakeholders to create a document that outlines practices and opportunities to increase waste diversion.
- ✓ Project implementation can be done in phases.

Metrics:

- Waste diversion rates (%)

Responsible Parties

Airlines (Environmental Coordinators/Managers)
Energy Sustainability Coordinator

Special Considerations

American Airlines currently encourages recycling where practical. Typically, the food and food-related waste from flights goes through a catering contractor. At CLT, this contract is currently held by LSG Skychef. The catering contractor controls any waste diversion and disposal for that waste stream. Waste from flights that is not related to catering is managed by a separate contractor (currently Jet Stream at CLT), who removes the trash from the planes and disposes of it in the trash compactors at CLT.

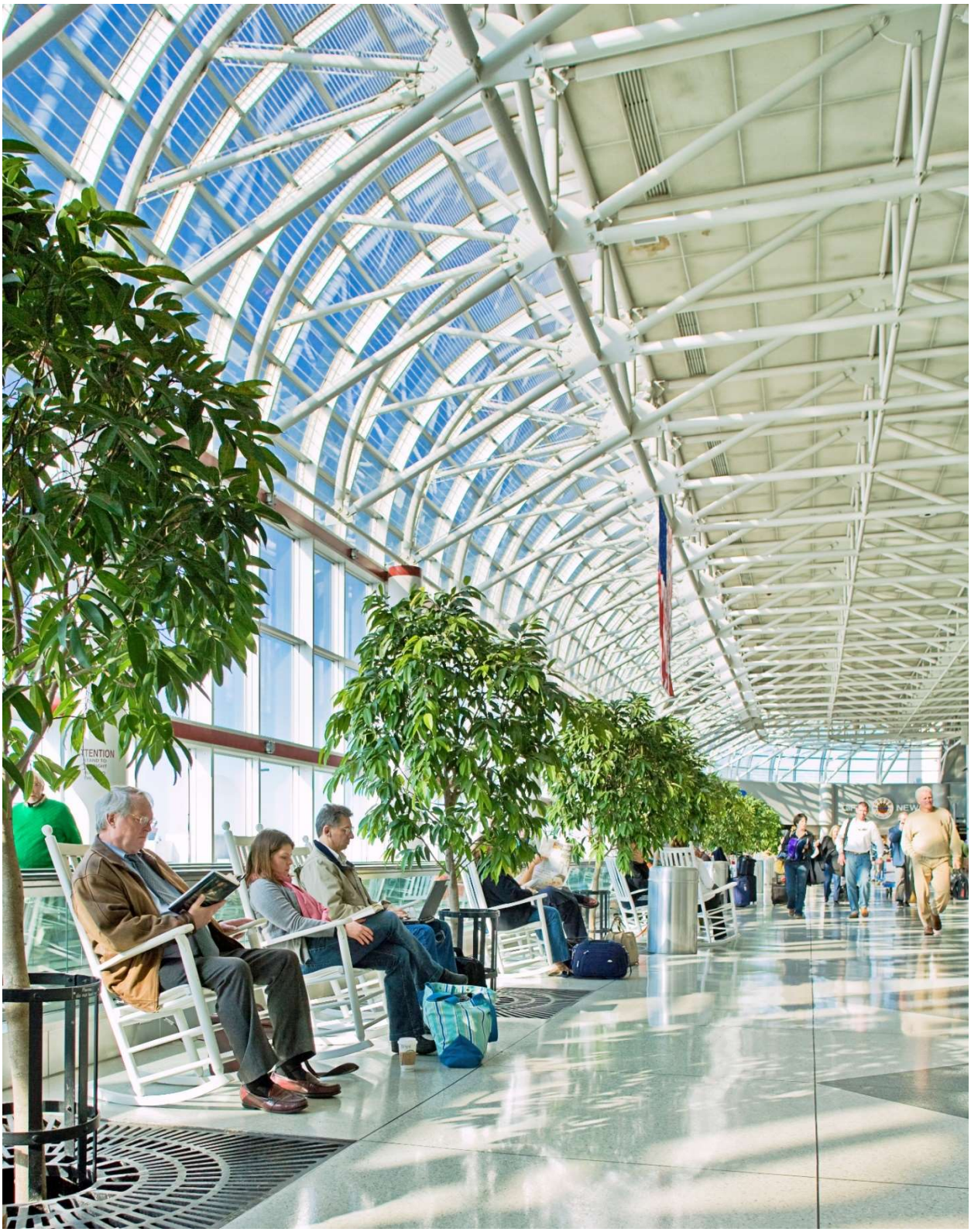


Image 3: The Atrium provides passengers a sense of place with rocking chairs, live trees, and live piano music to elevate the passenger experience and provide a relaxing environment.

5.2 HEALTH

OVERVIEW

Health is increasingly being used as an indicator of social sustainability. Furthermore, airport passenger experience is becoming more focused on comfort and wellness. The Health Focus Area considers physical and mental health and wellbeing of passengers, tenants and employees. In the context of an airport operation, health conditions can be improved by way of design of physical environments, provision of clean drinking water and healthy food options, meeting and exceeding air quality standards, employee wellness programs, and raising awareness about healthy lifestyle choices.

GOALS
Support employee, tenant, and passenger health
Design spaces to enhance passenger comfort and health
TARGETS
Increase employee participation in health and wellness programs
Meet or exceed best practice indoor and outdoor air quality standards

RESILIENCE CONSIDERATIONS:

CLT should consider the following related actions that support airport and community resilience:

- Extreme weather events such as heat waves can have adverse effects on air quality, when air becomes stagnant and air-borne pollutants become trapped[10]. By implementing occupant health standards, CLT is better prepared to provide safe, clean indoor environments for people in times of heat waves or other extreme conditions.
- To improve resiliency, CLT could consider integrating potential climate-related shocks and stressors into existing emergency response and health and safety protocols. A first step would be to identify risks and vulnerabilities from a health perspective, develop mitigation strategies and assign responsible parties to address each.

[10] https://www.ncdc.noaa.gov/news/impact-weather-and-climate-extremes-air-and-water-quality

HEALTH: RECOMMENDED STRATEGIES

CERTIFICATIONS AND DESIGN STANDARDS

- H1 Explore third-party health standard certification

EMPLOYEE PROGRAMS

- H2 Conduct employee and passenger surveys to determine health priorities
- H3 Introduce health and wellness program based on survey results

AIR QUALITY

- H4 Implement clean construction policy
- H5 Introduce indoor air quality specifications for all materials
- H6 Introduce non-idling policy

H1 Explore third-party health standard certification

GOALS SUPPORTED
Support employee, tenant, and passenger health
Design spaces to enhance passenger comfort and health
TARGETS SUPPORTED
Increase employee participation in health and wellness programs
Meet or exceed best practice indoor and outdoor air quality standards

WELL and Fitwel are two recognized industry standards for increasing and encouraging wellness through the design of indoor environments.

The WELL Building Institute's mission is to improve human health and well-being in buildings and communities across the world through its WELL Building Standard[11]. The WELL standard addresses air, water, nourishment, light, fitness, comfort and mind.

Fitwel[12], developed by The Center for Active Design (CfAD), is the preeminent global not-for-profit organization working at the intersection of health and the built environment. Fitwel addresses community health, morbidity and absenteeism, social equity, wellbeing, healthy food, safety and physical activity.

It is recommended that CLT explore both standards and proceed with certification if the outcome will meet corporate objectives and the ROI is favorable.

COSTS
$$
IMPLEMENTATION
Timeline: Mid (years 2-3)

Implementation

Steps:

- ✓ Explore options
- ✓ Select standard
- ✓ Identify scope and frequency of certification
- ✓ Implement certification requirements
- ✓ Apply for certification

Metrics:

- The certification system will include all key metrics and tracking mechanisms. (*CLT to determine re-certification cycle. 5 years is recommended*).

Responsible Parties

Senior Airport Architect (Design)
Human Resources Manager (Certification)
Innovation and Experience Director (Certification)

Special Considerations

Some standards and certifications are more appropriate to pursue when occupying a new space or at the time of construction or renovation.

[11] https://www.wellcertified.com/about-iwbi
[12] https://fitwel.org/

H2 Conduct employee and passenger surveys to determine health priorities

GOALS SUPPORTED
Support employee, tenant, and passenger health
TARGETS SUPPORTED
Increase staff participation in health and wellness programs

Conduct a survey of all employees and passengers to determine where the perceived needs are in Health and Wellness. The passenger survey will be optional, but all Staff and Tenants will be encouraged to fill out the Survey to ensure accuracy.

Employee and passenger input will help identify where CLT can invest time and effort to improve health and wellness of full-time and transient building occupants. This could include ergonomically designed office furniture, improved access to healthy food and clean water, or offering fitness classes to employees. A survey will help determine what is working and what needs to be addressed.

CLT currently delivers a passenger survey once every 6 months and uses the results to determine how the Airport can do a better job in serving its customers.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Immediate and ongoing

Documents to update/create:

- *New survey or addition of health and wellness questions to existing survey*

Implementation

Steps:

- ✓ Create survey
- ✓ Circulate survey
- ✓ Compile findings
- ✓ Analyze findings and make recommendations for policy change and/or future focus of wellness program.

Metrics:

- Staff survey response rate (%)
- Passenger survey response rate (%)
- Improvement in employee satisfaction over time, per survey responses

Responsible Parties

Human Resource Manager
Innovation and Experience Director

Special Considerations

H2 Survey must be completed prior to implementation of H3 (development of health and wellness program)

H3 Introduce health and wellness program based on survey results

GOALS SUPPORTED
Support employee, tenant, and passenger health
TARGETS SUPPORTED
Increase staff participation in health and wellness programs

Create a program for employees based on the results from the Health and Wellness Survey. Encourage participation by introducing Health and Wellness initiatives to new employees during orientation activities when they are hired.

Consider enhancements in terminals to improve passenger health, based on survey responses from passengers. Consider improvements to general comfort and the addition of amenities such as children's play areas.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Modify current approach to employee wellness programs.
- ✓ Internal marketing to encourage participation (e.g. competitions or incentives)
- ✓ Assign a representative within the Human Resources Department to oversee implementation and track participation rates and satisfaction levels for this program.

Metrics:

- Employee participation rate (%)

Responsible Parties

Human Resource Manager

Special Considerations

H2 Survey must be completed prior to H3.

H4 Implement clean construction policy

GOALS SUPPORTED
Support employee, tenant, and passenger health
TARGETS SUPPORTED
Meet or exceed best practice indoor and outdoor air quality standards

A clean construction policy could require contractors to submit compliance reports for CLT to track fuel use by type of vehicle or equipment, number of haul trips, amount of materials salvaged and reused or recycled, amount of recycled content in materials used, sediment control methods, dust control methods, noise abatement methods, etc. CLT staff should also spot-check job sites periodically. A clean construction policy could have the following benefits:

- Reduce the impact of construction and demolition projects on air and water quality.
- Reducing truck traffic with associated benefits of cost savings resulting from reduced use of traditional fuels and reduced number of haul trips.
- Less congested roadways (by reduced haul trips), less fugitive dust, and less noise.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Short (year 1) begin immediately

Documents to update/create:

- *Airport design guidelines / master specification*
- *Boiler-plate sections of RFPs and RFQs, as applicable*
- *Create a Clean Construction Policy*

Implementation

Steps:

- ✓ Develop a clean construction policy and plan for in-house revision of construction master specs, or if using a 3rd party contractor, issue RFP.
- ✓ Update airport design guidelines, construction master specs, and other appropriate documents, as required, to capture new construction policy.
- ✓ Provide training for appropriate personnel on new construction policy and requirements, may include: construction team and contract employees, O&M and facility staff, project coordinators, Development Department, and/or project managers.
- ✓ Require clean construction policy compliance for all future new construction and major renovations.

Metrics:

- Compliance report rate from contractors (%)
- Spot-checks on job sites/year (%)

Responsible Parties

Senior Airport Architect
Airport Engineer / Engineering Program Managers

Aligns with:

- ✓ W10 Increase and track construction waste diversion
- ✓ EE 12 Develop a sustainable logistics policy
- ✓ Green Globes

H5 Implement air quality specifications for all materials

GOALS SUPPORTED
Design spaces to enhance passenger comfort and health
TARGETS SUPPORTED
Meet or exceed best practice indoor and outdoor air quality standards

Develop an Indoor Air Quality (IAQ) policy for new construction and renovations. Introduce requirements for purchases and operations policy, that would include furniture, vendors, and air quality monitoring systems. Baseline performance requirements could include: elimination of VOCs[13] and formaldehyde and ongoing air quality monitoring. The policy could require the use of green cleaning products to reduce toxicity and exposure.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Short (year 1)

Documents to update/create:

- *Airport design guidelines / master specification*
- *Create an IAQ Policy*

Implementation

Steps:

- ✓ Develop an IAQ policy and plan for in-house revision of construction master specs, or if using a 3rd party contractor, issue RFP.
- ✓ Update airport design guidelines, construction master specs, and other appropriate documents, as required, to capture new IAQ policy.
- ✓ Provide training for appropriate personnel on new IAQ policy and requirements, may include: construction team and contract employees, O&M and facility staff, project coordinators, and/or Project Managers.
- ✓ Require IAQ policy compliance for all future expansions, new construction and renovations, and for all future purchases and operations materials.

Metrics:

- VOC (%)

Responsible Parties

Senior Airport Architect
Airport Engineer / Engineering Program Managers

Special Considerations

If not enforced and tracked, contractors will not abide by specifications; compliance could be tied to contract payment.

Aligns with:

- ✓ Green Globes

[13] "*Volatile Organic Compounds, or VOCs are organic chemical compounds whose composition makes it possible for them to evaporate under normal indoor atmospheric conditions of temperature and pressure.*" *US EPA: Indoor Air Quality (IAQ)*

H6 Introduce non-idling policy

GOALS SUPPORTED
Support employee, tenant, and passenger health
TARGETS SUPPORTED
Meet best practice IAQ and outdoor air quality standards

Develop a non-idling policy for Airport tenant/vendor, city-owned and operated vehicles. Introduce a limited idling time for landside and airside vehicles to reduce emissions and reduce localized sources of air pollution.

Signage at landside can indicate maximum idling time, while a policy can direct maximum idling time for tenants and airside operations.

ACI's Carbon Accreditation Program includes strategies for reducing idling, including driver education on fuel conservation strategies. Additionally, the SEAP Action Area 6 includes providing 'eco-driving' training to staff to increase awareness on fuel conservation and emissions reductions.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Long (year 3+)

Documents to update/create:

- *Create non-idling policy*

Implementation

Steps:

- ✓ Model policy after existing frameworks
- ✓ Collaborate with regulators/lawyers
- ✓ Draft a policy
- ✓ Work with regulators and legislators to advocate for enforcement of maximum idling times.

Metrics:

- % of fleet covered by policy
- GHG reduction (tons CO_2e)

Responsible Parties

Fleet Maintenance Manager

Special Considerations

Legal issues around State regulations and what CLT can require. Enforcement may prove to be challenging.

Aligns with:

- ✓ Green Globes
- ✓ SEAP Action Area 6: *Strive toward 100% zero carbon city fleet by 2030*
- ✓ ACI Carbon Accreditation Program

Image 4: CLT augments its fleet with electric vehicles.

Image 5: Solar photovoltaic system installed on the roof of the CLT Center.

5.3 ENERGY AND EMISSIONS

OVERVIEW

Reducing energy use and greenhouse gas emissions (GHG) will improve efficiency of airport operations and help reduce CLT's contribution to climate change. Strategies to reduce energy use and increase use of clean and renewable energy sources will reduce energy costs and contribute to the financial sustainability of CLT. Energy and Emissions strategies pertain to airport infrastructure, energy supply, facilities operations and maintenance and fleet management. Goals, targets and strategies under this Focus Area align with the City of Charlotte's Strategic Energy Action Plan (SEAP), and commitment to reducing citywide greenhouse gas emissions. The SEAP focuses on three key pillars that align with the areas where Charlotte's emissions are highest and where there is the opportunity for drastic reduction in emissions: buildings, transportation and energy generation.

GOALS
Reduce energy use and emissions from airport operations
Increase renewable energy supply and/or purchase
Increase use of alternative fuel vehicles
TARGETS
Strive towards 100% zero carbon airport-owned buildings
Strive towards 100% zero carbon airport-owned fleet

RESILIENCE CONSIDERATIONS:

CLT should consider the following related actions that support airport and community resilience:

- ✓ Onsite renewable energy generation and storage capacity will increase airport energy independence during extreme events, by allowing the Airport to recover more quickly and remain in operation if the grid is not functioning.
- ✓ Increasing CLT's energy independence will reduce strain on the grid and support community resilience objectives in Charlotte and the surrounding communities.
- ✓ Cost-benefit calculations for renewable energy solutions should include the cost (financial and social risk) of potential impacts of extreme weather events.

ENERGY AND EMISSIONS: RECOMMENDED STRATEGIES

RENEWABLE AND LOW CARBON SUPPLY

- EE1 Increase onsite renewable energy
- EE2 Assess feasibility of central energy plant with low carbon energy supply
- EE3 Purchase renewable energy credits or other offsite renewable supply
- EE4 Pursue ACI Carbon Accreditation

OPERATIONS AND MAINTENANCE

- EE5 Use automated "smart" HVAC and lighting controls
- EE6 Track energy use through monitoring and sub-metering
- EE7 Explore feasibility and impact of green roofs

FLEET AND VEHICLES

- EE8 Develop unified fleet strategy
- EE9 Explore feasibility of electric shuttle bus fleet
- EE10 Provide vehicle charging infrastructure at all parking facilities
- EE11 Continue to work with airlines to convert GSE to electric
- EE12 Develop a sustainable logistics delivery policy

ENERGY AND EMISSIONS: BASELINE DATA SUMMARY

ANNUAL ENERGY USE BASELINE (2016)

Current and Previous Actions: Energy
Installed a building monitoring & automation system (BAS)
Upgrading of equipment to full direct digital control (DDC) enabling BAS control – ongoing, partially complete
Upgrading single speed drives to variable speed drives (VSD) to modulate for demand – ongoing, partially complete
Optimized baggage system energy conservation through VSDs and control sensors
High efficiency chillers
Smart Grid controls to LED street lights
Installed LEDs on portions of buildings and airfield – ongoing replacement program
Solar parking lot lights pilot project in 2012 as a demonstration of renewable energy for outdoor lighting
Installed100 kW solar array at Airport's Fire Station #41
Installed 235 kW Solar PV on roof of CLT Center

Annual Electricity		Annual Gas	
CLT Utility Total	Terminal Building	CLT Utility Total	Terminal Building
81,500 MWh	70,000 MWh	370,000 therms	300,000 therms

CLT Airport Utilities	Annual Electricity Emissions	65,000 Tons CO2
	Annual Gas Emissions	2,200 Tons CO2
Vehicle Fleet	Annual Gasoline Emissions	8,000 Tons CO2

EE1 Increase onsite renewable energy

GOALS SUPPORTED
Reduce energy use and emissions from airport operations
Increase renewable energy supply and/or purchase
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned buildings

CLT should explore opportunities and develop a plan to increase onsite renewable energy supply. It is recommended that CLT develop a phased plan that will be implemented in stages over several years. The renewable energy supply plan could include:
- Incremental targets for kWh renewable generation over time
- A requirement for solar on new construction projects
- Study feasibility of ground and roof-mounted solar
- Study feasibility of geoexchange
- Develop metering and monitoring strategy

COSTS
Variable
IMPLEMENTATION
Timeline: Phased rollout over several years

Documents to update/create:
- *Airport design guidelines*

Implementation

Steps:
- ✓ Develop a capital funding plan for renewable energy, which includes installation of new on-site systems.
- ✓ Include feasibility study requirement for solar or geoexchange on new construction projects in airport design guidelines.
- ✓ Coordinate with Airport Development Director, Airport Architect and Engineering Project Coordinators to incorporate renewable energy generation into new construction and major renovation projects.
- ✓ Track progress annually, summarize and report findings.

Metrics:
- Total energy generated (kWh)
- % of total energy (annually) from renewables (kWh)

Responsible Parties
Planning Director
Energy Sustainability Coordinator

Special Considerations
FAA requires the Airport to undertake a study to ensure there are no adverse impacts from glare from the solar arrays.

Aligns with:
- ✓ Green Globes
- ✓ SEAP Action Area 5: *Strive toward 100% zero carbon municipal buildings by 2030*
- ✓ ACI's Carbon Accreditation Program

EE2 Assess feasibility of central energy plant with low carbon energy supply

GOALS SUPPORTED
Increase renewable energy supply and/or purchase
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned buildings

The Central Energy Plant (CEP) is currently under design (at the time that this Plan was written). Since it is not anticipated that renewable energy will be used as a low-carbon energy supply for the CEP, it is recommended that CLT assess the feasibility for low carbon energy supply (including geothermal, solar PV and solar thermal hot water), increase plant efficiencies, and reduce emissions (from gas fired equipment).

COSTS
$$
IMPLEMENTATION
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Complete initial high-level geothermal feasibility study
- ✓ Estimate required central plant net capacity (for peak demands), and the utility costs and emissions a central energy plant would offset.
- ✓ Additional investigation would include more detailed analysis, identifying potential locations, outlining new proposed system components, and may include a cost estimate (including LCC and ROI).
- ✓ Investigate if any grants or incentive programs are offered and/or different financial models and options available.
- ✓ Summarize and report findings.

Metrics:

- Annual energy & resources avoided by increased operational efficiency

Responsible Parties

Facilities Maintenance Director
Planning Director

Special Considerations

Site constraints such as location and orientation for new installation(s). Capital cost. Phasing work while airport remains fully operational.

Aligns with:

- ✓ SEAP Action Area 5: *Strive toward 100% zero carbon municipal buildings by 2030*
- ✓ ACI's Carbon Accreditation Program

EE3 Purchase renewable energy credits or other offsite renewable supply

GOALS SUPPORTED
Increase renewable energy supply and/or purchase
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned buildings

To support the 100% zero carbon buildings target, the five recommended steps[14] are below:

1. Shift demand (if possible)
2. Reduce consumption/efficiency
3. Change energy consumed
4. Generate on site
5. Purchase

This strategy aligns with the final step to achieving zero carbon, step 5: purchase. Once steps 1-4 have been implemented and CLT has determined the relative cost of purchasing versus generating on site, the next step is to determine the amount of renewable energy to be purchased.

COSTS
$$
IMPLEMENTATION
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Have in place (or develop) a funding plan to purchase renewable energy; renewable energy purchases similar to RECs.
- ✓ Investigate renewable energy purchase agreement options through utilities or other sources
- ✓ Determine renewable energy cost premium
- ✓ Track progress annually, summarize and report findings

Metrics:

- Purchased energy (kWh)
- % of total energy annually (kWh)

Responsible Parties

Planning Director
Energy Sustainability Coordinator

Special Considerations

Capital Cost. Utility provider rate structure and details.

Aligns with:

- ✓ Green Globes
- ✓ SEAP Action Area 5: *Strive toward 100% zero carbon municipal buildings by 2030*
- ✓ ACI's Carbon Accreditation Program

[14] 5 Stages to Zero Carbon Energy" Carbon Captured LTD

EE4 Pursue Airport Carbon Accreditation certification

GOALS SUPPORTED
Reduce energy use and emissions from airport operations
Increase renewable energy supply and/or purchase
Increase use of alternative fuel vehicles
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned buildings
Strive towards 100% zero carbon airport-owned fleet

Airports Council International (ACI) offers a carbon accreditation program specifically designed to help airports map and manage their carbon footprint. Four different levels of accreditation can be pursued, depending on the scope of emissions inventory reporting and management plans established. It is recommended that CLT explore options within ACI's accreditation standards and proceed with certification.

COSTS
$$; Staff person depending on rigor of certification
IMPLEMENTATION
Timeline: Long (year 3+)

Documents to update/create:

- *Policy commitment to emissions reduction*
- *Reporting of Carbon Footprint and proof of actions*
- *TBD based on certification requirements*

Implementation

Steps:

- ✓ Review accreditation levels
- ✓ Select target accreditation level
- ✓ Identify scope and reporting data required
- ✓ Implement certification requirements
- ✓ Apply for certification

Metrics:

- The certification system includes all key metrics and tracking mechanisms.

Responsible Parties

Energy Sustainability Coordinator

Aligns with:

- ✓ Green Globes
- ✓ SEAP Action Area 5: *Strive toward 100% zero carbon municipal buildings by 2030*
- ✓ SEAP Action Area 6: *Strive toward 100% zero carbon city fleet by 2030*

EE5 Use automated "smart" HVAC and lighting controls

GOALS SUPPORTED
Reduce energy use and emissions from airport operations
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned buildings

Smart controls use real-time data to adjust HVAC and lighting settings based on real-time needs. Utilize automated analytics and fault detection and diagnostics (FDD) software for building automation system (BAS), to increase operational efficiency. Require automated controls for all future expansions, new construction and modifications in airport design guidelines.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Mid (year 2-3)

Documents to update/create:
- *Airport design guidelines*
- *O&M manuals*

Implementation

Steps:
- ✓ Review energy audit findings and the recommended energy conservation measures (ECMS)
- ✓ Identify ECMs related to controls and opportunities where controls can improve operational efficiency. Primarily HVAC and lighting control upgrades (such as daylight, CO, CO_2 & motion sensors and system resets) which can modulate systems based on real time needs.
- ✓ Develop a plan for required work, upgrades, and sources of funding.
- ✓ Discussion to determine what to implement or timeline for upgrades.
- ✓ Prioritize ECMs & make business decisions.
- ✓ Create a timeline plan to upgrade existing systems; work may be phased over several years and/or aligned with renovation projects.
- ✓ Train appropriate personnel on new systems and upgrades.

Metrics:
- Annual energy consumed by HVAC and Lighting (kWh)
- Annual energy and resources avoided by ECMs and controls (kWh)

Responsible Parties

Building Maintenance Manager
Energy Sustainability Coordinator

Special Considerations

Phasing work while airport remains fully operational and upgrading existing systems. Complete upgrades concurrently with other required work to reduce disruption and cost.

Aligns with:

- ✓ Green Globes
- ✓ SEAP Action Area 5: *Strive toward 100% zero carbon municipal buildings by 2030*
- ✓ ACI's Carbon Accreditation Program

EE6 Track energy use through monitoring and sub-metering

GOALS SUPPORTED
Increase renewable energy supply and/or purchase
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned buildings

Real-time energy monitoring and sub-metering of end use consumption, performance and operation efficiency is a first step to improving efficiency of energy use across the Airport's operations. The more data that is accessible, the better equipped employees are to ensure that all systems are optimized for energy efficiency and cost savings. Monitoring is done using submeters, smart meters, and information from building automation system (BAS).

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Short (year 1)

Documents to update/create:
- *Airport design guidelines*
- *O&M manuals*

Implementation

Steps:
- ✓ Review the recommended energy conservation measures (ECMs) in the energy audit related to monitoring and metering and identify opportunities where sensors and submeters can track end uses.
- ✓ Require sub-metering on all future expansions, new construction and renovations in airport design guidelines.
- ✓ Develop a plan for required work, upgrades, and sources of funding.
- ✓ Update O&M manuals, as required, to capture any upgrades and new systems.
- ✓ Train appropriate personnel on new systems and upgrades.

Metrics:
- Annual energy consumed, by end use
- Annual energy use intensity

Responsible Parties
Building Maintenance Manager
Energy Sustainability Coordinator

Special Considerations
Phasing work while airport remains fully operational and upgrading existing systems.

Aligns with:
- ✓ Green Globes
- ✓ SEAP Action Area 5: *Strive toward 100% zero carbon municipal buildings by 2030*
- ✓ ACI Carbon Accreditation Program

EE7 Explore feasibility and impact of green roofs

GOALS SUPPORTED
Reduce energy use and emissions from airport operations
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned buildings

Green roof infrastructure at CLT will result in several benefits including a reduced urban heat island effect for the Airport, and reduced heating and cooling demand (reduced energy use). Plant material contributes to improved air quality and improves stormwater runoff, as well as sound insulation within the facility. Green roofs also have a longer life-expectancy for roof structure (40 years vs 20 years) and reduced roof replacement costs over time. In addition to the measurable benefits from green roofs, they are a visible symbol of commitment to airport sustainability.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Mid (year 2-3)

Implementation

Steps:

- ✓ Focus on green roofs for new construction projects.
- ✓ Determine potential CLT buildings, considering structural weight bearing capacity on existing roofs, and waterproofing.
- ✓ Determine potential tenant building opportunities
- ✓ Establish approved plant materials that are drought resistant, low-height growth, non-wildlife attractant, perennials

Metrics:

- Energy use over time
- Air quality / microclimate
- Water retention

Responsible Parties

Senior Airport Architect

Special Considerations

Higher upfront cost than traditional roofs. CLT has an informal policy that green roofs should be placed on landside locations only (wildlife attractant). It is recommended that this be established as a formal policy.

Aligns with:

- ✓ Green Globes
- ✓ SEAP Action Area 5: *Strive toward 100% zero carbon municipal buildings by 2030*

EE8 Develop unified fleet strategy

GOALS SUPPORTED
Increase use of alternative fuel vehicles
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned fleet

With the target striving toward 100% zero carbon airport-owned fleet, CLT should phase in zero carbon fleet vehicles over time. To address the transition of fleet vehicles not within CLT's direct ownership or control, it is recommended that the Airport explore potential contractual levers that can be used to require airlines, catering and other on-site external operators to transition to low-carbon fleet vehicles.

COSTS
$$
IMPLEMENTATION
Timeline: Short (year 2-3)

Documents to update/create:

- *Create Unified Fleet Strategy*

Implementation

Steps:

- ✓ Consultant work with CLT to develop internal Fleet Sustainability Strategy and Policy
- ✓ Adapt that policy and extend to external fleets and develop agreements that can be proposed and negotiated with external fleets
- ✓ Work with fleets to get adoption and transition to achieve targets

Metrics:

- *Number/percentage of alternative fuel and/or zero-carbon fleet vehicles*

Responsible Parties

Fleet Maintenance Manager
Energy Sustainability Coordinator

Special Considerations

CLT has limited authority over external fleet management. Limitations may exist for specialized and heavy equipment.

Aligns with:

- ✓ SEAP Action Area 6: *Strive toward 100% zero carbon city fleet by 2030*
- ✓ ACI's Carbon Accreditation Program

EE9 Explore feasibility of electric shuttle bus fleet

GOALS SUPPORTED
Increase use of alternative fuel vehicles
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned fleet

Initiate a feasibility study to gather data and analyze feasibility for electric shuttles and required charging infrastructure. Develop a phased approach to introduce all-electric shuttles, as technology is proven and based on available funding.[15]

COSTS
$$
IMPLEMENTATION
Timeline: Short (year 2-3)

Implementation

Steps:

- ✓ Feasibility study to determine vehicle types, charging infrastructure, costs and available technologies
- ✓ Phase-in plan for charging infrastructure and vehicle replacement

Metrics:

- Shuttles converted to EV/AltFuel (%)
- Calculated GHG reduction (tons CO_2e)
- Shuttles using renewable fuel electricity (%)

Responsible Parties

Fleet Maintenance Manager
Energy Sustainability Coordinator

Special Considerations

The capital cost for conversion to EV/AltFuel and associated infrastructure. Available grants and sources of funding.

Aligns with:

- ✓ SEAP Action Area 6: *Strive toward 100% zero carbon city fleet by 2030*
- ✓ ACI's Carbon Accreditation Program

[15] At the time that this Plan was written, CLT agreed to purchase five battery-electric buses for ground transportation, with plans to phase in additional vehicles in the future.

EE10 Provide vehicle charging infrastructure at parking facilities

GOALS SUPPORTED
Increase use of alternative fuel vehicles
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned fleet

Initiate a planning study to determine appropriate electric vehicle (EV) charging capacity and siting of infrastructure throughout CLT parking facilities. This includes both public-facing, and for employees and CLT buses and fleet. The initial study is to gather data and provide analysis of factors impacting Electric Vehicle Service Equipment (EVSE/charging station) deployment, including current and future demand, internal fleet demand/usage, potential vendors, potential funding and revenue generation.

This strategy will help to support the estimated 1.2 million EVs forecasted to be sold in the United States in 2025, which is estimated to be approximately 7% of annual vehicle sales.[16] Additionally, North Carolina has ordered the Department of Transportation (DOT) and the Department of Environmental Quality (DEQ) to develop a strategy that will support the increase of registered EVs to 80,000 in the State by 2025.[17]

COSTS
$$
IMPLEMENTATION
Timeline: Mid (year 2-3)

Implementation

Steps:

- ✓ Consultant to work with CLT to gather data and conduct EVSE Planning Study
- ✓ Findings can lead to issuing an RFP for equipment acquisition and deployment
- ✓ Deployment (installation) can be phased in over time

Metrics:

- % of parking spaces with EVSE
- Vehicles charged per time period
- kWh consumed
- % using renewable electricity
- # of charging points
- # of Level 2 chargers/DC Fast Chargers

Responsible Parties

Fleet Maintenance Manager
Energy Sustainability Coordinator

Special Considerations

Capital Cost; installing sufficient infrastructure to accommodate electric vehicle adoption rate in Charlotte and vicinity

Aligns with:

- ✓ SEAP Action Area 6: *Strive toward 100% zero carbon city fleet by 2030*
- ✓ ACI's Carbon Accreditation Program

[16] Report: Plug-in Electric Vehicle Sales Forecast Through 2025 and the Charging Infrastructure Required. 2017. Edison Electric Institute (EEI).

[17] Executive Order No.80. North Carolina's Commitment to Address Climate Change and Transition to a Clean Energy Economy. 2018. Governor Roy Cooper.

EE11 Continue to work with airlines to convert GSE to electric

GOALS SUPPORTED
Increase use of alternative fuel vehicles
Reduce energy use and emissions from airport operations
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned fleet

Continue to work with airlines to convert ground service equipment (GSE) to electric vehicles (EV), and to convert other airline fleet vehicles to alternative-fueled or electric vehicles. Explore mechanisms for CLT to encourage and accelerate airline conversion to EV for all GSE. Initiate a feasibility study for airside operations electrification.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Mid (year 2-3)

Implementation

Steps:

- ✓ Consultant to work with CLT to gather data and conduct feasibility study
- ✓ Findings can be used to develop an RFP for charging equipment acquisition and deployment, which would coordinate with Airline plans

Metrics:

- Fuel $ saved
- kWh consumed
- % using renewable electricity
- tons of GHG saved
- % of GSE that is EV or AltFuel
- Number of EVSE for GSE
- # of Airlines with EV GSE

Responsible Parties

Fleet Maintenance Manager
Energy Sustainability Coordinator

Special Considerations

Capital Cost; airline involvement

Aligns with:

- ✓ SEAP Action Area 6: *Strive toward 100% zero carbon city fleet by 2030*
- ✓ ACI's Carbon Accreditation Program

EE12 Develop a sustainable logistics delivery policy

GOALS SUPPORTED
Reduce energy use and emissions from airport operations
TARGETS SUPPORTED
Strive towards 100% zero carbon airport-owned fleet

Introduce a policy to streamline shipping and receiving operations. Inefficient scheduling of shipping and receiving can result in outcomes that impact the environment, and inconvenience local communities.

A 'sustainable logistics policy' would aim to schedule shipping and receiving in order to reduce both traffic congestion and idling. An efficient schedule would reduce the number of truck trips, and reduce Idling time for vehicles (e.g. waiting in traffic or waiting in line to make deliveries or pick-ups). Idling vehicles cause air pollution that could be avoided by reducing congestion.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Short (year 1)

Documents to update/create:

- *Potential updates to master specifications, contract language, operating agreements, lease documents, and similar documents*

Implementation

Steps:

- ✓ Determine CLT departments to involve in developing and enforcing policy
- ✓ Determine mechanism to require compliance by vendors (master specifications, contract, operating agreement, lease, etc.)
- ✓ Set plan for in-house development of policy, implementation with vendors, enforcement, and tracking compliance

Metrics:

- Number and fuel-type of delivery trucks removed from current delivery schedules

Responsible Parties

Terminal Property Manager

Special Considerations

Vendor resistance, CLT's ability to require and enforce policy related to vendor deliveries.

Aligns with:

- ✓ SEAP Action Area 6: *Strive toward 100% zero carbon city fleet by 2030*
- ✓ ACI's Carbon Accreditation Program

Image 6: CLT's Facilities Bus Wash reclaims water for reuse in subsequent wash cycles.

5.4 WATER, STORMWATER AND LANDSCAPE

OVERVIEW

The scale of CLT's operation presents a range of opportunities to reduce potable water use, improve stormwater management practices, and nurture sustainable low impact landscapes. This Plan includes strategies supporting reduction in water use by employees and passengers, taking advantage of water reuse opportunities, ensuring that stormwater is effectively managed, and landscaping in a locally appropriate way using native plants and vegetation to maximize stormwater retention.

GOALS
Reduce water use per passenger in terminal
Improve stormwater capture, treatment, and reuse
Improve quality and reduce impact of landscapes
TARGETS
Reduce water use per passenger by 15%
Capture and treat 50%-90% of stormwater

RESILIENCE CONSIDERATIONS:

CLT should consider the following related actions that support airport and community resilience:

- Native plants and green infrastructure help to mitigate the impacts of extreme rain events and floods by absorbing rainfall and enhancing infiltration, thereby reducing the volume of stormwater that flows into local streams and rivers.[18]
- Reducing potable water use for irrigation, toilet flushing, and cooling towers allows the Airport to conserve water consistently and have a low operational demand during droughts

[18] Source: US EPA, Green Infrastructure: Manage Flood Risk, online at: https://www.epa.gov/green-infrastructure/manage-flood-risk

WATER, STORMWATER AND LANDSCAPE: RECOMMENDED STRATEGIES

POTABLE WATER CONSERVATION

- WSL1 Install smart meters and sub-meters
- WSL2 Retrofit fixtures to most efficient models
- WSL3 Use non-potable water for toilet flushing, irrigation, cleaning and cooling towers

STORMWATER MANAGEMENT

- WSL4 Assess chemical composition of runoff at lowest points
- WSL5 Maximize permeable surfaces to slow stormwater

LANDSCAPE

- WSL6 Select landside plants, focusing on native plants, that maximize stormwater retention
- WSL7 Explore introduction of grazing herd for landscape maintenance

WATER, STORMWATER AND LANDSCAPE: BASELINE DATA SUMMARY

CURRENT AND PREVIOUS ACTIONS
Water Conservation: New bus washing station with water recirculation (2018)
Upgrade of restroom fixtures to lower flow (2007)
Installation of low flow motion detector faucets and toilets
Native and draught tolerant species specified for landscaping
Using preheated glycol for deicing

Water conservation and efficiency measures haven't been routinely quantified and reported, therefore, it was not possible to capture accurate baseline data. Thus, this Plan recommends water metering and tracking water use, where possible, as an initial strategy.

WSL1 Install smart meters and sub-meters

GOALS SUPPORTED
Reduce per passenger water use in terminal
TARGETS SUPPORTED
Reduce per passenger water use by 15%

Smart meters and sub-meters will measure the amount of potable water consumption for different uses throughout the facility. Installing such devices will result in reduced potable water use through: (1) review, analysis, and tracking of meter data, (2) reduced water utility costs, (3) providing detailed measured water usage by end type, (4) an increased ability to identify exactly where water leaks and/or spikes in usage are occurring, (5) an increased ability to quickly respond to spikes in water usage, (6) an increased ability to identify opportunities to achieve further reductions in water use, and (7) reduced maintenance costs and labor.

COSTS
$$
IMPLEMENTATION
Timeline: Short (year 1)

Documents to update/create:

- *Create a Metering Approach and Work Plan to identify appropriate locations, facilities, and end uses for metering, data analyses and applications, and accurate costs for installation and O&M.*

Implementation

Steps:

- ✓ Measure baseline water use
- ✓ Determine end uses to be monitored
- ✓ Identify number and location of meters required to monitor each end use depending on the existing and current plumbing system design
- ✓ Install meters/sub-meters; design future improvements to support metering
- ✓ Smart meters and sub-meters will quantify the amount of water used for all major end uses throughout the facility. This will allow CLT to focus future efficiency measures towards the areas that will have the largest impact in reducing potable water use and/or are determined to be the most cost-effective investment

Metrics:

- Gallons/Month used for metered end uses
- Diurnal and seasonal peaks

Responsible Parties

Building Maintenance Manager

Special Considerations

Potential quantity of meters needed based on the existing plumbing system

Aligns with:

- ✓ Green Globes

WSL2 Retrofit fixtures to most efficient models

GOALS SUPPORTED
Reduce per passenger water use in terminal
TARGETS SUPPORTED
Reduce per passenger water use by 15%

Plumbing fixtures are available in varying flow rates that reduce potable water consumption relative to the maximum flow rates outlined in EPAct 1992. Applicable fixtures should have the WaterSense label and the specific flush/flow rates may be selected based on the type of fixture and amount of water reduction desired by the facility. Installation of efficient fixtures will result in reduced potable water use; reduced water utility costs and reduced sewage conveyance volumes.

COSTS
$$
IMPLEMENTATION
Timeline: Short (year 1)

Documents to update/create:
- *Airport Design Guidelines*

Implementation

Steps:
- ✓ Determine flush and flow rates for existing fixtures
- ✓ Determine scope of replacement (i.e., just flush/flow fixture valves or both flush/flow fixture valves and water closet, urinal and sink bowls to accommodate reduced use rates)
- ✓ Prioritize fixtures to be replaced based on potential water saved per facility/end use and anticipated cost per unit replaced
- ✓ Specify fixtures to be replaced, including desired flush and/or flow rates
- ✓ Order new fixtures
- ✓ Coordinate installation with CLT maintenance staff and/or CLT approved sub-contractors

Metrics:
- Reduction in potable water use for plumbing fixtures compared to the existing baseline condition (gallons/month) based on existing fixture ratings or metered data, when available

Responsible Parties
Building Maintenance Manager

Special Considerations
Compatibility of low-flow fixtures with existing water closet, urinal and sink bowls; Facilities Department staff acceptance of low-flow fixtures (based on vendor/product information); Up-front cost to replace all fixture types; Electronic Fixtures (if desired) may not be feasible if existing restrooms do not have necessary electrical connections.

WSL3 Use non-potable water for toilet flushing, irrigation, cleaning, and cooling towers

GOALS SUPPORTED
Reduce water use per passenger in terminal
Improve stormwater capture, treatment, and reuse
TARGETS SUPPORTED
Reduce water use per passenger by 15%
Capture and treat 50%-90% of stormwater

Water closets, urinals, landscape irrigation, cleaning and cooling towers use water for purposes that do not include human consumption. For this reason, alternative, non-potable water (NPW) sources may be used to reduce the amount of potable (drinking) water that the facility uses. Where rainwater can be harvested for non-potable uses, untreated stormwater runoff discharges would also be reduced. Reclaiming condensate will result in reduced NPW use. Additional steam wastewater may be available in the form of boiler blowdown.

COSTS
$$$
IMPLEMENTATION
Timeline: Mid (year 2-3)

Documents to update/create:

- *Create a Non-Potable Water Recycling Plan*
- *CLT Policy for Sustainable Facilities*
- *Stormwater Master Plan*

Implementation

Steps:

- ✓ Identify sources and locations of available non-potable water (NPW)
- ✓ Identify type/level of treatment and storage required to use and maintain adequate NPW supply for desired end uses
- ✓ Determine quantity of NPW needed to offset potable water use, including potential future improvements that may occur
- ✓ Perform Life Cycle Cost Analysis using first cost estimates for collection piping and collection tank in combination with annual offset in utilizing potable water.
- ✓ Annual maintenance increase should be included for recycling and reuse systems.

Metrics:

- Non-potable water used
- Condensate captured and reused on-site
- Stormwater captured and used on-site
- Potable water purchased from local utility
- Reduction in potable water use
- Stormwater used for process cooling

Responsible Parties

Building Maintenance Manager

Special Considerations

Feasibility/cost of installing dual-plumbing for all restrooms given current plumbing design and configuration. Area of storage required to supply recycled water to desired end uses. Temperature requirements for end uses. Climate conditions and seasonal variations that may affect rainwater harvesting.

Aligns with:

- ✓ Green Globes

WSL4 Assess chemical composition of runoff at lowest points

GOALS SUPPORTED
Reduce untreated stormwater runoff discharges
TARGETS SUPPORTED
Capture and treat 50%-90% of stormwater

This action involves using and improving upon existing water quality testing at various locations throughout the Airport to identify stormwater best management practices (BMPs)—structural and non-structural. Knowing the chemical composition of stormwater runoff will help identify the pollutants in upstream tributaries and guide water quality improvement strategies. Long-term testing is also an option to quantify the impact of constructed stormwater BMPs and conduct cost-effectiveness assessments. This action can complement the water quality testing currently conducted as part of the CLT NPDES permit (testing is 4 times per year). De-icing fluid management locations and topographic low points will be target areas for assessments.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Short (year 1)

Documents to update/create:

- *CLT Stormwater Master Plan*
- *Stormwater Pollution Prevention Plan (NPDES Permit Requirements)*

Implementation

Steps:

- ✓ Identify low points using topographic maps or survey, and de-icing fluid management locations.
- ✓ Nominate representative sampling locations and quantities based on upstream tributary areas and areas with suspected contaminated runoff (and in conjunction with existing SWPPP monitoring activities). This may include stormwater outfalls.
- ✓ Assess samples and establish report with recommendations for water quality treatment.
- ✓ Continue with any follow-up or long-term monitoring and testing to quantify effectiveness of constructed practices.

Metrics:

- Concentrations/loads of pollutants (ppm, mg/L, lbs, etc.)
- Water quality at low points (ppm, mg/L, lbs, etc.)

Responsible Parties

Environmental Manager

Special Considerations

Determination of low points constrained by accuracy of topographic maps or surveys. Testing staff must be able to access all areas that require testing.

WSL5 Maximize permeable surfaces to slow stormwater

GOALS SUPPORTED
Improve stormwater capture, treatment, and reuse
TARGETS SUPPORTED
Capture and treat 50%-90% of stormwater

Some impervious surfaces such as sidewalks, rooftops, and parking lots can be replaced with or augmented by permeable materials. There may also be opportunities to reconfigure, realign, and/or abandon existing roadways and parking lots. Permeable materials include soils, vegetation, green roof components, and permeable pavements that can be installed in conjunction with water treatment and storage facilities. Decreasing the amount of impervious surfaces can decrease runoff volumes, flow rates, and the impacts of localized flooding. Filtration through permeable surfaces and underlying soil layers treats stormwater runoff.

COSTS
$$
IMPLEMENTATION
Timeline: Mid (year 2-3)

Documents to update/create:
- *CLT Stormwater Master Plan*
- *CLT Design Standards Manual*

Implementation

Steps:
- ✓ Identify large swaths of impervious areas and localized flooding zones with impervious tributaries.
- ✓ Assess which impervious areas could be removed or augmented with permeable surfaces (including load assessment).
- ✓ Assess soil conditions and drainage requirements to minimize extent of standing water and ponding durations after typical and heavy rainfall events.
- ✓ Design pervious solutions and establish maintenance plan.
- ✓ Construct pilots as necessary to trial various strategies, measure benefits, and compare against pilot costs and scaled up costs.
- ✓ Consider incorporating permeable design strategies into existing design standards.

Metrics:
- Impervious area reduction (sq. ft.)
- Volume of stormwater runoff managed (gallons)
- Reduction in pollutant concentrations (ppm, mg/L, lbs, etc.)

Responsible Parties

Environmental Manager

Special Considerations

FAA regulations may restrict implementation near certain impervious areas such as runways and taxiways, for safety reasons. Permeable pavement and other pervious surfaces may not be able to withstand heavy loading. Any landscaping or water storage areas must be mindful of their potential for attracting wildlife.

Aligns with:
- ✓ Green Globes

WSL6 Select landside plants, focusing on native plants, that maximize stormwater retention

GOALS SUPPORTED
Improve stormwater capture, treatment, and reuse
Improve quality and reduce impact of landscapes
TARGETS SUPPORTED
Capture and treat 50%-90% of stormwater

Reduction of stormwater run-off at CLT serves to reduce overall water quality impacts from contaminated stormwater runoff and reduces the potential for flooding of off-airport areas.

Bioretention is the process in which contaminants and sedimentation are removed from stormwater runoff that is collected in a constructed treatment area, which typically includes a pond, plants, and similar landscaping/organic materials. (Note, Bioretention systems must drain within 48 hours).

Consider positive health impacts and air quality impacts of landscaping.

COSTS
$$
IMPLEMENTATION
Timeline: Mid (year 2-3)

Documents to update/create:

- *Landscape selection practices*
- *Stormwater Pollution Prevention Plan*
- *Airport Wildlife Hazard Management Plan*

Implementation

Steps:

- ✓ Continue audit of landscaping and irrigation
- ✓ Determine scale of the project and the CLT departments to involve
- ✓ Set plan for in-house assessment and design/construction, or if using a 3rd party contractor, issue RFP
- ✓ Consult with FAA airport wildlife biologist, USFWS, and USDA

Metrics:

- Surface runoff (gallons)

Responsible Parties

Environmental Manager; Landscape Supervisor; Airport Wildlife Coordinator

Special Considerations

Consider bioretention, the process in which contaminants and sedimentation are removed from stormwater runoff that is collected in a constructed treatment area, which typically includes a pond, plants, and similar landscaping/organic materials.
For bioretention systems: land areas available; costs for implementation and maintenance. Bioretention systems must drain within 48 hours.
Improper landscaping can attract animals to the Airport and create wildlife hazards, while proper landscaping can deter and/or guide species to designated perimeter areas, instead of the active airfield. By understanding and controlling possible habitats near the active airfield, wildlife strike risk can be reduced.

Aligns with:

- ✓ Green Globes

WSL7 Explore introduction of grazing herd for landscape maintenance

GOALS SUPPORTED
Improve quality and reduce impact of landscapes

Grazing herds at airports can be utilized for efficient removal of vegetation along steep embankments and rocky areas that are difficult to maintain with traditional mowing or spraying, as well as removal of vegetated habitat for wildlife that may be hazardous to airport operations. Such herds provide a reduction in heavy equipment use, minimizing soil erosion, and decreased landscape maintenance costs including fuel, labor, herbicides and equipment.

The decrease in heavy equipment use results in a reduction of lawnmowers, trimmers and weed-eaters that emit carbon dioxide and other pollutants. The elimination of mowing/landscape debris and the associated need for transportation of debris to landfills thereby reduces emissions from transport vehicles.

Similar to the green roof strategy, grazing herds are also a visible symbol of commitment to airport sustainability.[19]

COSTS
$$ Medium
IMPLEMENTATION
Timeline: Medium (year 2-3)

Implementation

Steps:

- ✓ Perform Cost-Benefit Analysis
- ✓ Issue RFP and select vendor
- ✓ Requires coordination among CLT divisions: Environment, Sustainability, Airfield Operations, Security, Communications
- ✓ Suggest coordination with outside agencies on-site at CLT (USDA, FWS, etc.)

Metrics:

- Amount of fuel savings that would have been used in lawn maintenance equipment (tons CO2e)
- Reduced volume of herbicides and other chemicals that would have been used to eliminate weeds (as herds are an alternative to toxic herbicides)

Responsible Parties

Landscape Supervisor
Airport Wildlife Coordinator

Special Considerations

Higher upfront cost than traditional methods. Safety and security concerns would have to be identified and addressed. The North Carolina Air National Guard (NCANG) attempted this previously without much success logistically or financially.

[19] Source Chicago Department of Aviation Grazing Herd, online at: https://www.flychicago.com/community/environment/herd/pages/default.aspx

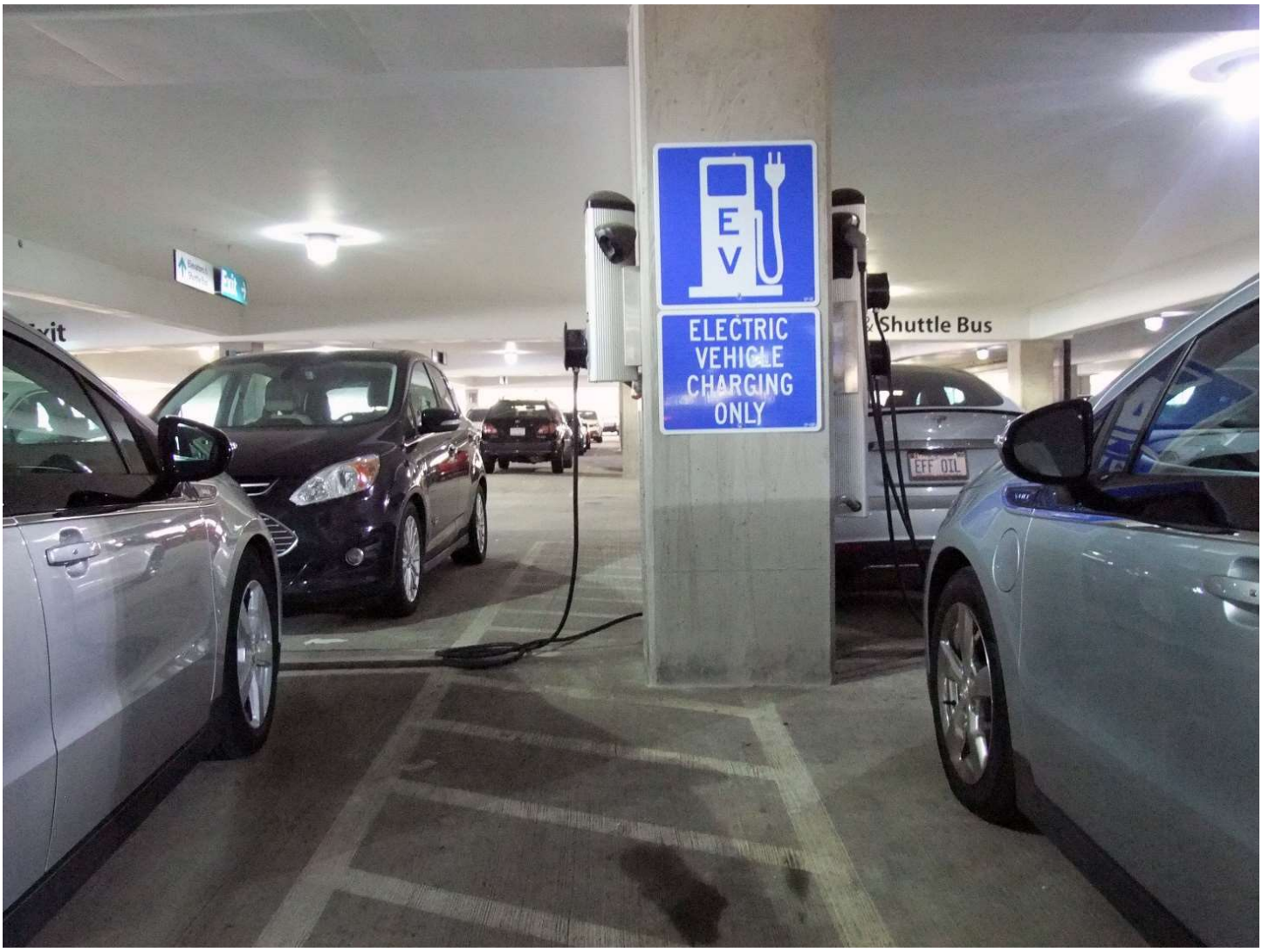


Image 7: CLT provides electric vehicle charging stations for passenger, employee and fleet use, as public demand for electric vehicles continues to rise.

5.5 TRANSPORTATION

OVERVIEW

CLT Airport is a regional transportation hub, with a high volume of individuals travelling to and from 365 days a year. The variety of transportation modes have a range of impacts from a sustainability perspective, ranging from single occupancy gas vehicles, to public transportation and ride shares, to cycling. This Plan positions CLT to demonstrate leadership in supporting sustainable transportation by encouraging more sustainable modes of regional and site-specific transit options for passengers and employees. The strategies explored in this Focus Area include a broad scope of opportunities, including reducing single-occupancy vehicle travel, increasing the use of alternative fuels for onsite vehicles, and promoting active transportation.

GOALS
Reduce single-occupancy vehicle use and increase sustainable modes of transportation
Increase alternative fueling infrastructure
Reduce congestion and idling
TARGETS
Increase alternative transportation and ride share to 50% of trips
Adopt best practice targets for EV charging infrastructure

RESILIENCE CONSIDERATIONS:

CLT should consider the following, related actions that support airport and community resilience:

- ✓ Creating a multi-modal system for people traveling to the Airport allows for redundancy in the system and more variety in choice. If one mode of transportation suddenly becomes unavailable (e.g. a severe accident that blocks road access), then a system redundancy (e.g. train, bus, or other mode) would be available.

TRANSPORTATION: RECOMMENDED STRATEGIES

EMPLOYEE COMMUTE

- T1 Survey employee commute
- T2 Expand ride share programs with incentives
- T3 Improve cycling and pedestrian access to CLT

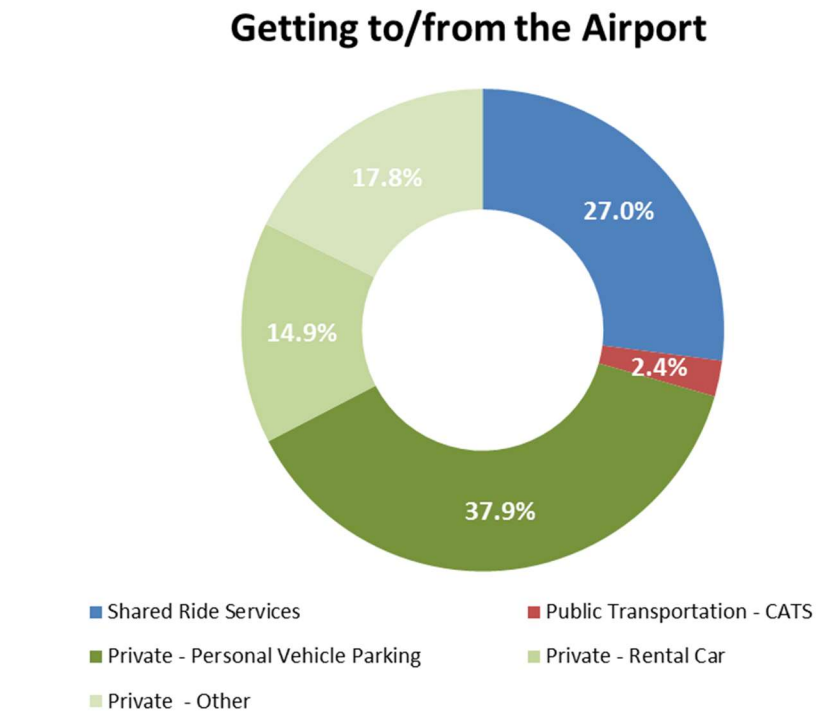
REGIONAL TRANSPORTATION

- T4 Serve as an advocate in regional transportation planning

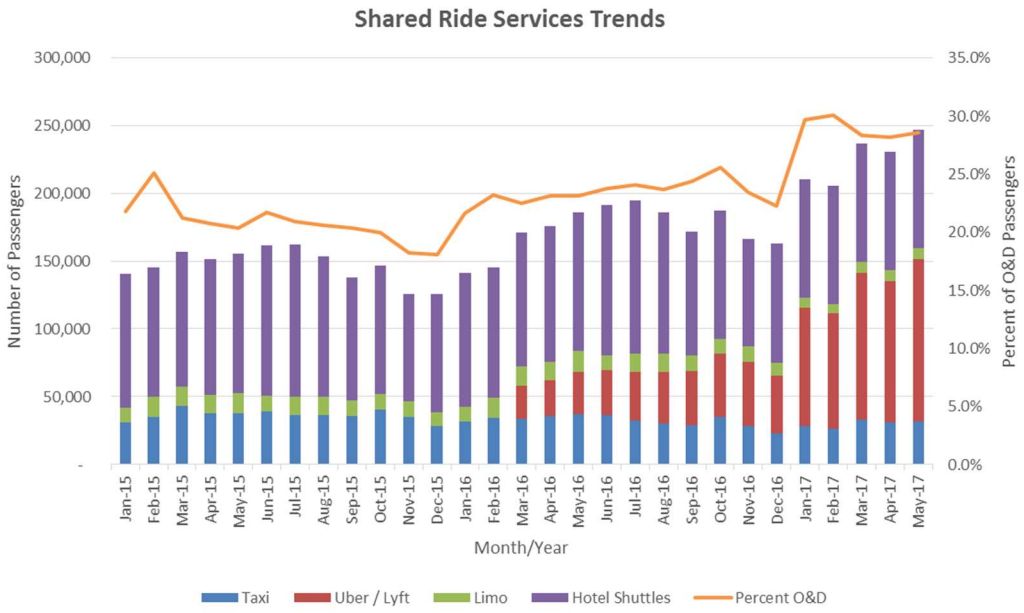
SURFACE TRANSPORTATION AND PARKING

- T5 Digital display of parking spots available

TRANSPORTATION: BASELINE DATA SUMMARY

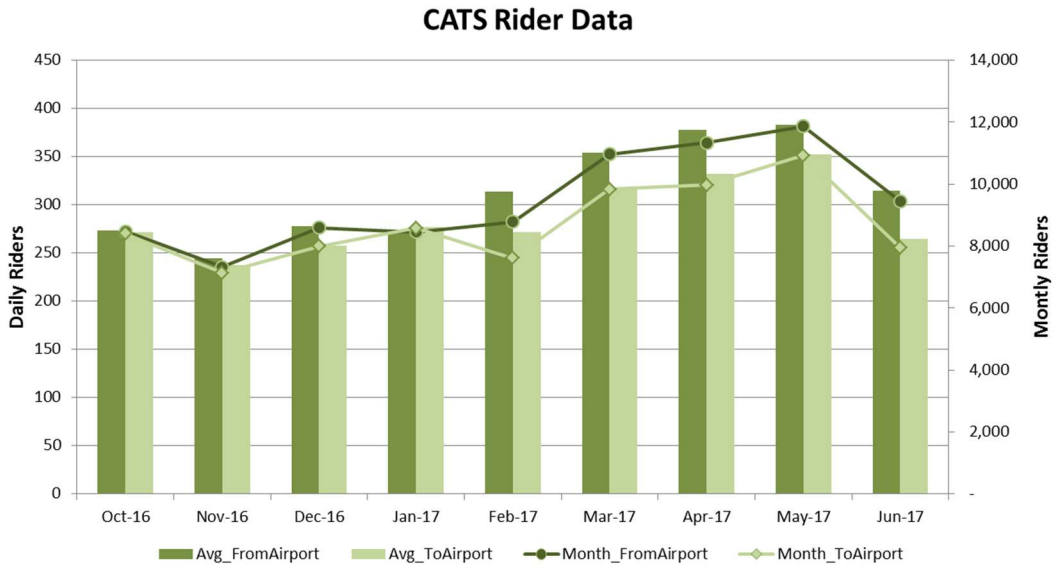


Source 1: Charlotte Douglas International Airport Data, August 2017

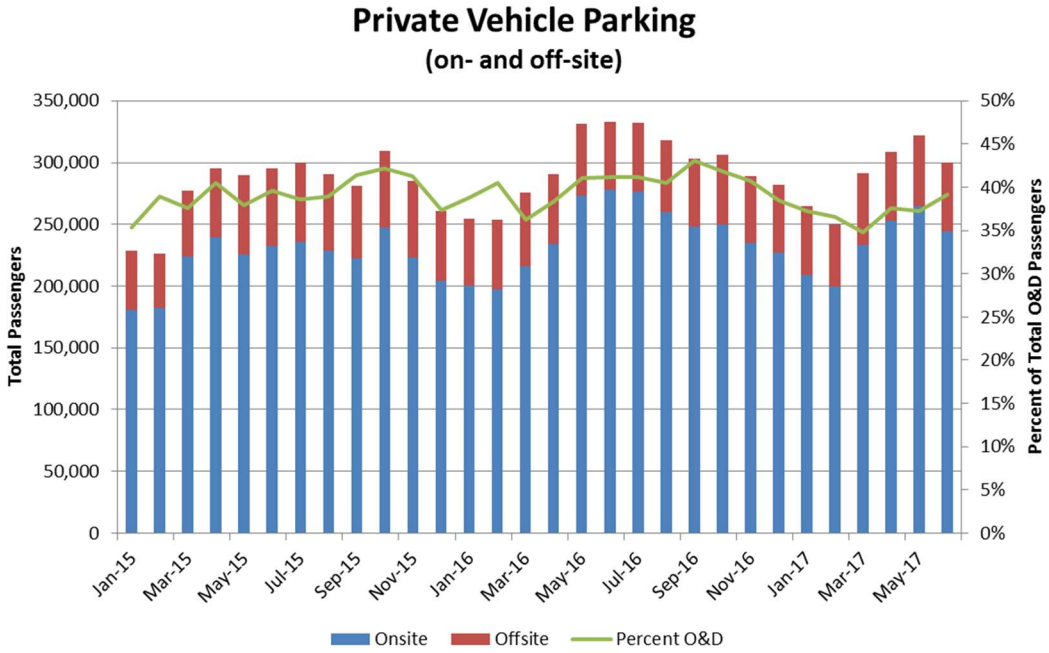


Source 2: Charlotte Douglas International Airport, August 2017

TRANSPORTATION: BASELINE DATA SUMMARY



Source 3: Charlotte Douglas International Airport, August 2017



Source 4: Charlotte Douglas International Airport, August 2017

Current and Previous Actions[20]
45% discount to City of Charlotte employees on CATS
17 Electric Vehicle charging stations since 2011
Developing a plan to purchase 5 Proterra Electric buses per year for transportation between parking lots and terminal

[20] As of 2017

T1: Develop Employee and Passenger Commute Survey

GOALS SUPPORTED
Reduce single-occupancy vehicle use and increase sustainable modes of transportation
TARGETS SUPPORTED
Increase alternative transportation and ride share to 50% of trips

Develop and distribute a commute survey to all employees. The survey should request information about employees' daily commute including:

- Daily miles traveled
- Mode of transportation
- Fuel type (for personal automobiles)
- Frequency of travel (e.g. 5 days/week)

Develop a quarterly survey online or by way of kiosks to gather information about how O&D passengers are going to and from CLT. The Information gathered from surveys could help identify opportunities to reduce emissions from transportation and assist in planning future infrastructure needs (e.g. number and location of charging points for electric vehicles) and support the transition to making the last mile of a person's journey zero carbon).

COSTS
$ low
IMPLEMENTATION
Timeline: Short term (Year 1)

Implementation

Steps:

- ✓ Develop and distribute employee survey
- ✓ Develop public-facing transportation survey
- ✓ Track results

Metrics:

- Vehicle miles traveled
- Greenhouse gas emissions averted

Responsible Parties

Research and Innovation Manager

Aligns with:

- ✓ SEAP Action Area 8: *Facilitate rapid uptake of sustainable modes of transportation*
- ✓ ACI's Carbon Accreditation Program

T2: Expand ride share programs with incentives

GOALS SUPPORTED
Reduce single-occupancy vehicle use and increase sustainable modes of transportation
Increase alternative fueling infrastructure
Reduce congestion and idling
TARGETS SUPPORTED
Increase alternative transportation and ride share to 50% of trips

Ride share programs generally reduce GHGs, improves air quality, ensures equitable access to airport across the city, and reduce commuting costs for employees. CLT should strive to increase CATS usage for getting to/from the Airport above the 2.4%/300 round trips per day, and shared ride services above 27%.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Engage with peer airports for lessons learned.
- ✓ Provide an Interactive/intuitive website that matches people commuting from nearby areas, with the same or similar work times.
- ✓ Coordinate and enroll employees in CATS vanpool program.
- ✓ Implement the CATS "Employee Transportation Coordinator" (ETC) program.
- ✓ Provide preferential parking for passengers and employees driving alternative fuel vehicles.

Metrics:

- Employee-based surveys. Tracking on database website.
- % of employees that switch from single occupancy vehicles to rideshare program and/or transit

Responsible Parties

Economic & Community Affairs Manager
Community Affairs Coordinator

Special Considerations

It's also important to find a way to track employees by each specific vanpool if possible.

- ✓ *T1 must be implemented as a precondition to T2*

Aligns with:

- ✓ SEAP Action Area 8: *Facilitate rapid uptake of sustainable modes of transportation.*
- ✓ ACI's Carbon Accreditation Program

T3: Improve cycling and pedestrian access to CLT

GOALS SUPPORTED
Reduce single-occupancy vehicle use and increase sustainable modes
Reduce congestion and idling
TARGETS SUPPORTED
Increase alternative transportation and ride share to 50% of trips

Work with local authorities to improve upon or develop cycling and pedestrian infrastructure. The intention is to connect CLT with a regional cycling and pedestrian network that would provide a safe and convenient alternative means of travel to and from the airport for employees and others wishing to use these modes of transportation. This will help reduce emissions from single occupancy vehicles, reduce congestion, improve air quality, and reduce commuting costs for employees.

Ensure that there are adequate bike storage facilities accessible to employees and passengers at the Airport. Develop safe connections between buildings at the Airport to encourage biking and walking as opposed to car or shuttle (within designated areas designed for alternative modes of transportation).

COSTS
$-$$$ (depending on facility)
IMPLEMENTATION
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Install bike lockers and other bike storage infrastructure.
- ✓ Active mode wayfinding signage.
- ✓ Establish bicycle and pedestrian infrastructure to connect existing facilities within the airport, to allow employees to walk or bike between buildings as needed.

Metrics:

- % of new sidewalks, bike paths, and multi-use paths.
- Employee surveys for travel mode (see T1).
- Bike counts at designated parking facilities.
- # of new facilities that promote active transportation.

Responsible Parties

CDOT / City of Charlotte
Airport Development Manager

Special Considerations

While luggage and the location of the Airport make active transportation not as likely for travelers, future developments (such as the new River District in Dixie-Berry Hill), and incentivizing employee active transportation can make this action successful. The safety of the riders will also need to be considered, as the airport roadways can be potentially a dangerous environment for bicycles.

Aligns with:

- ✓ SEAP Action Area 8: *Facilitate rapid uptake of sustainable modes of transportation.*
- ✓ ACI's Carbon Accreditation Program

T4: Serve as an advocate in regional transportation planning

GOALS SUPPORTED
Reduce single-occupancy vehicle use and increase sustainable modes
Reduce congestion and idling
TARGETS SUPPORTED
Increase public transportation and ride share to 50% of trips

It is recommended that CLT staff members advocate locally and regionally for improvements to public transportation and sustainable transportation planning.

Because CLT does not have direct control over transportation modes, it is recommended that CLT position itself as a leader in cross-jurisdictional transit planning as a means of impacting transportation behaviors and impacts beyond the scope of its operation.

This will help reduce GHGs by providing equitable transit access (therefore reducing driving alone). New transit mobility options can lead to increased economic development near transit stations.

COSTS
Inexpensive (<$50,000)
IMPLEMENTATION
Timeline: Mid (year 2-3)

Implementation

Steps:

- ✓ Quarterly transit focused meetings with appropriate jurisdictions.
- ✓ Multi-jurisdictional approach to improve mobility and access to airport.

Metrics:

- Ongoing meetings with action item statuses (with completed items) that include improvements to mobility and/or access based on meeting outcomes.
- # of new transit routes (rail or bus) within CATS jurisdiction that will help serve the airport directly or via transfer to route with direct service.

Responsible Parties

Economic & Community Affairs Manager
Planning Director

Special Considerations

Cost of implementing transportation alternatives

Aligns with:

- ✓ SEAP Action Area 8: *Facilitate rapid uptake of sustainable modes of transportation.*
- ✓ ACI's Carbon Accreditation Program

T5: Digital display of parking spot availability

GOALS SUPPORTED
Reduce congestion and idling
TARGETS SUPPORTED
Increase public transportation and ride share to 50% of trips

A digital parking display, potentially powered by solar, will reduce GHGs by decreasing time driving through parking areas looking for spaces. Digital parking displays are used at high capacity parking garages. They provide real time information about how many spots are available in each parking zone.

The purpose of digital parking displays is to facilitate drivers' ability to rapidly find an available spot. The environmental benefit is that it reduces emissions associated with drivers circulating within the parking garages for long periods of time. This strategy is currently underway.

COSTS
$$
IMPLEMENTATION
Timeline: Short (year 1)

Implementation

Steps:

- ✓ RFP for contractor for installation

Metrics:

- % of reduced idling/driving searching for spaces
- Reduction of GHGs

Responsible Parties

Senior Airport Planner

Special Considerations

Measuring success.

Aligns with:

- ✓ ACI's Carbon Accreditation Program

Image 8: CLT values its role in the community and strives to elevate the region it serves through air service, jobs, development and new opportunities.

Image 9: The 12th annual Runway 5K attracted more than 1,000 participants to CLT's airfield and raised $21,390 for the Airport Opportunity Scholarship through Central Piedmont Community College.

5.6 COMMUNITY, EQUITY, AND ECONOMIC DEVELOPMENT

OVERVIEW

As one of Charlotte's largest employers, CLT is an economic engine for the City and surrounding region. This Focus Area recognizes the impact of the Airport's operation on the community – including employees, business, and surrounding neighborhoods – and the opportunity to create a positive impact on the social and economic prosperity of the city and region. This Focus Area also addresses equity and inclusion among employees and in the broader community by strengthening diversity and inclusion policies and programs. Strategies support the objective of nurturing thriving individuals and communities that are resilient to environmental, social, and economic challenges. It should be noted that the Airport Area Strategic Development Plan (AASDP) addresses a range of community economic development priorities. It is recommended as a complement to this plan, that CLT continue to implement the AASDP to support Airport economic and social objectives.

GOALS
Increase awareness of diversity, equity and inclusion policies
Demonstrate commitment to local community capacity building
Support employee professional and personal development
TARGETS
100% of Aviation Department employees to go through diversity and sustainability training
Annual employee volunteer hours and participation in outreach programs
Annual hours staff education/career development training

RESILIENCE CONSIDERATIONS:

CLT should consider the following, related actions that support airport and community resilience:

- Engaged communities are more resilient during disasters and other extreme events
- Supporting local business creates a resilient economy surrounding the airport
- Diversifying the airport's revenue stream to allow it to be resilient through a fluctuating economy
- Host community events on how to deal with disasters, evaluate how the airport could help support the community post-disaster as a resilience hub

COMMUNITY, EQUITY + ECONOMIC DEVELOPMENT: RECOMMENDED STRATEGIES

EMPLOYEE AND HUMAN RESOURCES

- CEE1 Build upon career and training opportunities for employees and community
- CEE2 Expand trade school recruitment programs at local community colleges

EQUITY

- CEE3 Develop diversity and sustainability training for employees
- CEE4 Continue to provide multi-lingual assistance to passengers

COMMUNITY IMPACT

- CEE5 Continue employee volunteer program
- CEE6 Develop a fund to support local community economic development
- CEE7 Develop strategic community engagement plan

COMMUNITY, EQUITY, AND ECONOMIC DEVELOPMENT: BASELINE DATA

Current and Previous Actions: Community, Equity, and Economic Development
Charlotte Aviation Academy
Airport Neighborhood Committee
Aviation Employee Career Fair
Charlotte Business INClusion Program (CBI)
Limited English Proficiency Program (LEP)
Runway 5k

CEE1 Enhance career development and training opportunities for employees and community

GOALS SUPPORTED
Demonstrate commitment to local community capacity building
Support employee professional and personal development
TARGETS SUPPORTED
Annual hours of staff education and/or career development training

Explore opportunities that build upon existing employee career development program and training opportunities, internally for staff, and through community facing efforts, such as the annual career fair.

Continue to deliver annual career fair: A way to share internal career opportunities with Aviation employees and encourage communication and learning between departments.

COSTS
$ low
IMPLEMENTATION
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Poll employees to identify areas of interest with regard to professional development
- ✓ Introduce new initiatives based on results
- ✓ Promote and create opportunities for professional development among employees
- ✓ Continue to host annual community-facing career fair and internal Aviation Employee Career Fair

Metrics:

- Employee participation in programs
- Attendance at annual career fairs

Responsible Parties

Learning and Professional Development Manager

CEE2 Expand trade school recruitment programs at local community colleges

GOALS SUPPORTED
Demonstrate commitment to local community capacity building
TARGETS SUPPORTED
Annual hours of staff education and/or career development training

CLT has the opportunity to engage a local workforce, thus strengthening its impact on local community development by engaging students at community colleges and universities by raising awareness about career opportunities at CLT.

It is recommended that CLT collaborate with local community colleges and universities to assess ongoing opportunities to engage students in future careers in aviation and expand recruitment efforts at local trade schools to develop a future, local, knowledgeable workforce for CLT.

COSTS
Inexpensive **($50,000 or less)**
IMPACTS
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Create, strengthen, and maintain relationships with schools and trade programs.
- ✓ Assign a recruiter, track success.

Metrics:

- % new hires from local partnership programs

Responsible Parties

Human Resources Manager

CEE3 Develop sustainability, diversity, equity and inclusion training for employees

GOALS SUPPORTED
Increase awareness of diversity, equity and inclusion policies
Support employee professional and personal development
TARGETS SUPPORTED
100% of employees to go through diversity and sustainability training

Currently there is formal training for all new City employees through the "Cityview" program, both in person and available in online modules. Diversity and inclusion are emphasized as part of this existing training curriculum.

It is recommended that CLT ensures that the diversity, equity and inclusion curriculum is up to date and develop additional curriculum about sustainability. The sustainability curriculum could focus on the importance of sustainability in the context of airport operations and introduce employees to this Comprehensive Sustainability Plan.

COSTS
Inexpensive **($50,000 or less)**
IMPACTS
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Review current training curriculum
- ✓ Assess best practices in diversity and sustainability training
- ✓ Revise existing training curriculum as needed, including development of sustainability modules

Metrics:

- % employees participating

Responsible Parties

Workforce Development Coordinator
Energy Sustainability Coordinator

CEE4 Continue to provide multi-lingual assistance to passengers

GOALS SUPPORTED
Increase awareness of diversity, equity and inclusion policies

Charlotte Douglas International Airport (CLT) is responsible for maintaining the Limited English Proficiency Program (LEP), which provides LEP individuals with meaningful access to air travel and other important Airport services. Therefore, it is recommended that CLT continues to provide multi-lingual staff or volunteers to assist and escort passengers who need help wayfinding or with other aspects of their experience at CLT.

Additionally, the Aviation Department currently offers a Foreign Language Incentive Program as an additional means to source future talent for various positions and retention of multilingual staff; better communicate with the traveling public, employees, contractors, and other customers; and minimize the cost of contractual interpreting services.

To provide the necessary resources, CLT should continue to provide or consider adding:

- International arrival assistants to meet passengers at gates and give verbal directions.
- Translating widget to CLT's website
- Visual identification of volunteers, staff, and translators in the terminal who are bilingual/multilingual (such as a special "I Speak" pin)

COSTS
Inexpensive **($50,000 or less)**
IMPACTS
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Language map current staff to determine available resources
- ✓ Identify gaps by interviewing airport partners and collecting data from surveys
- ✓ Strategize on securing translators for identified critical languages
- ✓ Implement
- ✓ Review
- ✓ Ongoing self-assessment of the LEP program

Metrics:

- % languages spoken by staff

Responsible Parties

Terminal Operations Manager
Human Resources Manager
Civil Rights Specialist

CEE5 Continue employee volunteer program

GOALS SUPPORTED
Increase employee participation in community outreach programs
Support employee professional and personal development
TARGETS SUPPORTED
Annual employee volunteer hours and participation in outreach programs

It is recommended that CLT continues to track the hours that employees are volunteering to different organizations and community groups. The total amount of hours donated by staff can be quantified and used as a means of calculating collective impact.

Consider introducing a rewards or recognition program to encourage volunteering. Set targets for volunteer hours per employee or department. Maintain a place on CLT Connect where employees can find current information about the program and track their hours.

COSTS
Inexpensive **($50,000 or less)**
IMPACTS
Timeline: Short (year 1)

Implementation

Steps:

- ✓ Employees can track volunteer hours on CLT Connect – ensure broad commitment and participation
- ✓ Collect Data
- ✓ Analyze and Calculate
- ✓ Present/Report

Metrics:

- # and names of organizations
- # or % of staff volunteering
- # of hours annually
- Tracker implemented
- Hours tracked

Responsible Parties

Economic & Community Affairs Manager
Community Affairs Coordinator

Special Considerations

Develop an awards or recognition program (e.g. an "Appreciation Dinner") or acknowledge one "champion" each year. Cross-departmental coordination around community engagement would help facilitate such a program. This could include: Workforce Development, Public Affairs, Economic and Community Affairs, Business Diversity Programs.

CEE6 Develop a fund to support local community economic development

GOALS SUPPORTED
Increase employee participation in community outreach programs
Demonstrate commitment to local community capacity building
TARGETS SUPPORTED
Annual employee volunteer hours and participation in outreach programs

It is recommended that the Airport create a local community development fund. The fund would be a way for staff and passengers to contribute financially to community building and positive social impact locally. An example would be to use funds to support more community schools through School Supply Drives, Reading Buddies, etc. The fund could also be a means of formalizing giving from various fundraising activities, for example, proceeds from the 5k or the golf tournament could be directed toward a scholarship for students who are interested in aviation.

COSTS
Inexpensive **($50,000 or less)**
IMPACTS
Timeline: Mid (years 2-3)

Implementation

Steps:

- ✓ Survey staff for ideas on where to invest donations
- ✓ Create program to facilitate and encourage donations (~~/~~cash/check, /event, etc.)
- ✓ Track amount donated
- ✓ Set target
- ✓ Report

Metrics:

- $ amount~~s~~ raised and donated
- # or % of employees engaged
- # of fundraisers or programs
- % staff donating
- Target achieved

Responsible Parties

Director of Economic & Community Affairs

CEE7 Develop strategic community engagement plan and communications strategy

GOALS SUPPORTED
Demonstrate commitment to local community capacity building
TARGETS SUPPORTED
Annual employee volunteer hours and participation in outreach programs

Develop a strategic community engagement plan and communications strategy that supports the following, among other things:

- Improve the work that CLT is already doing in collaboration with community groups and volunteer organizations by aligning that work with new and emerging Airport objectives, including this Plan.
- Ensure that those successes are shared effectively through marketing and communications campaigns.
- Continue to report on sustainability in the Report of Achievement and include points in the Annual and Financial Reports.

Ensure that there is flexibility within the Strategic Community Engagement Plan, anticipating that the programs at CLT will change and grow.

COSTS
Inexpensive **($50,000 or less)**
IMPACTS
Timeline: Mid (years 2-3)

Implementation

Steps:

- ✓ Research Community Involvement Opportunities that are not currently engaged with the Airport
- ✓ Execute Alignment via donation of time/money/support
- ✓ Report

Metrics:

- % goals with associated community involvement
- Status of plan
- Targets, Goals, Actions implemented

Responsible Parties

Economic & Community Affairs Manager


Tequileria