



# Virginia Airports Sustainability Management Plan

## EXECUTIVE SUMMARY

VIRGINIA DEPARTMENT  
OF AVIATION  
SUSTAINABILITY



*“DOAV is proud to have created the first system-wide SMP to include all public use airports. The Virginia Airports SMP will help establish Virginian airports as environmental champions while keeping them economically competitive, and enriching their neighboring communities.”*

– Randall Burdette, DOAV Executive Director

---

*“Having participated in the development of the SMP first-hand, I feel confident saying it provides a wealth of resources for Virginia airports. We piloted the SMP materials at our airport and found it useful for helping us identify sustainability projects that will save money, reduce our consumption of natural resources, and enable stronger engagement with our community.”*

– Buzz Jarrell, Orange County Airport

## INTRODUCTION

---

Virginia residents depend on an efficient, high-performance air transportation system that connects businesses, promotes economic development, provides access to recreation, and facilitates tourism. Optimizing such a system requires a comprehensive, long-term approach to airport planning that maximizes environmental, social, and economic opportunities while minimizing the risks created by new challenges.

To that end, the Virginia Department of Aviation (DOAV) and Federal Aviation Administration (FAA) commissioned the Virginia Airports Sustainability Management Plan (SMP), which provides a voluntary framework for the 66 public-use airports in Virginia to undertake tailored sustainability planning to meet their local priorities, needs, and abilities. The SMP is designed to be practical and useful in helping airport managers integrate sustainability into all aspects of their business, including planning, design, construction, operations, and maintenance. The SMP provides a menu of sustainability initiatives from

which individual airports can select information and resources that work for them. It also provides a number of specific resources and tools that Virginia airport managers can use if and when they need them.

The Virginia Airports SMP includes a Statewide Framework document that sets the overall vision for sustainability in the Commonwealth and introduces the SMP's main sustainability categories. Additionally, to make the resources relevant to the various types and sizes of airports in Virginia, DOAV developed SMP Supplements that further define specific goals, metrics, targets, and possible sustainability initiatives for three general categories of airports. Each supplement is accompanied by additional documents providing guidance on funding opportunities, stakeholder engagement, and utility performance tracking specific to the particular airport category. The SMP and supplementary resources are available for download at: [www.doav.virginia.gov/Sustainability.htm](http://www.doav.virginia.gov/Sustainability.htm).



LED lighting at Newport News/Williamsburg International Airport



## LASTING VALUE FOR VIRGINIA AIRPORTS

The definition of an efficient, functional air transportation system is evolving to include responsiveness to new challenges, including climate risks and uncertain fuel prices, as well as other environmental, social, and economic demands. The Virginia Airports SMP provides Virginia's airports with tailor-made resources and tools to build lasting and beneficial sustainability initiatives. The SMP can provide a benefit to airports by helping them:

- ▶ Achieve financial savings through operational efficiency
- ▶ Improve communication and relationships with neighboring communities
- ▶ Reduce environmental impact and compliance risks
- ▶ Increase competitiveness relative to similarly sized airports

## LEADERSHIP

The Virginia Airports SMP positions Virginia for national leadership on aviation sustainability issues. As the first sustainability management plan for all public-use airports across an entire state, the Virginia Airports SMP puts the Commonwealth at the forefront of efforts to promote a sustainable future through excellence in planning and operations in an important sector of the economy.



Franklin Municipal-John Beverly Rose Airport

## DEVELOPMENT OF THE VIRGINIA AIRPORTS SMP

Public-use airports in Virginia have made strong progress in implementing sustainability initiatives. However, until recently the Commonwealth lacked a systemic vision for sustainability planning at airports, and no specific guidance existed for undertaking such planning. DOAV developed the Virginia Airports SMP in order to help Virginia's public-use airports integrate sustainability into the management of their facilities.

DOAV assembled a Statewide Steering Council including representatives from six airports of varying types, sizes, and geographic locations, members of DOAV, other branches of Virginia state government, the Federal Aviation Administration (FAA), and industry professionals. The Steering Council met six times over the course of the SMP development, and provided early input, articulated stakeholder concerns, validated assumptions and methodologies, and helped ensure a focus on the usability and practicality of products for airport sponsors.

Extensive additional input was also provided by airports across the Commonwealth. Airport managers and other personnel provided responses to an online survey, gave additional follow-up information during telephone interviews with the project team, and engaged in an interactive workshops. This range of input helped the project team gather qualified data including anecdotes of current airport sustainability practice in Virginia, and identify the sustainability-related needs, priorities, and challenges of airports in Virginia.

### DEVELOPMENT PROCESS

The DOAV developed the Virginia Airports SMP to help Virginia's public-use airports integrate sustainability into the management and operations of their facilities. SMP development began in January 2015 and was completed in the summer of 2016. The development process included six phases:

1. Stakeholder engagement and information gathering
2. Articulation of a sustainability vision
3. Sustainability goal-setting and metric development
4. Sustainability tool and resource development
5. Ground-truthing of tools and resources through case studies
6. Final documentation and dissemination



Sustainability plans from airports around the country informed the development of the Virginia Airports SMP

# SMP STATEWIDE FRAMEWORK

The Virginia Airports SMP is comprised of four main documents: a Statewide Framework and three Supplements. The Statewide Framework presents the foundational elements of the SMP. These elements include the characteristics of the Virginia aviation system, the current state of aviation sustainability initiatives in the United States—including those at airports participating in the Federal Aviation Administration’s (FAA) Sustainability Master Plan Pilot

Program, and at other Virginia airports—and the rationale for sustainability-focused planning at Virginia airports. The Statewide Framework introduces the five sustainability categories and twelve subcategories that create the basis for the content of the SMP. Subcategories have a menu of associated goals, from which an airport can choose (see table below).

CATEGORY	SUBCATEGORY	EXAMPLE GOAL*
Economic Performance	Air Service and Business Development	Attract additional aviation-related, on-airport businesses.
	Non-Aeronautical Development	Attract local businesses with potential ties to airport customers.
	Asset Management and Resilience	Integrate standardized sustainability and resilience measures into the airport’s asset management system and everyday operations.
Airport Community	Airport Workforce	Enrich opportunities and the experience of citizens communicating feedback to the airport on issues of concern.
	Public Outreach	Promote employee satisfaction, retention, and workforce development.
Energy and Emissions	Energy Efficiency	Reduce operating costs by decreasing usage of natural gas and other thermal fuel.
	Transportation Fuels	When feasible, switch to alternatively-powered ground vehicles operated at the airport.
	Energy Generation	Increase portion of airport’s electricity supplied by onsite renewable energy sources.
Waste	Waste Management and Recycling	Increase the airport’s diversion rate through recycling and reuse.
	Chemical and Hazardous Waste Management	Find and use substitutes for products with lower environmental, health, and safety risks.
Natural Resources	Stormwater Management	Reduce water quality and quantity impacts from stormwater runoff.
	Water Efficiency	Encourage tenants, airport users, and employees to use water efficiently.

\*A comprehensive list of all goals associated with each category and subcategory is provided in each of the SMP Supplements



SMP Statewide Framework

The Statewide Framework also defines the three main groupings of airports referenced in the SMP, based on initial airport classifications made in the Virginia Air Transportation System Plan. The three airport categories are:

**Commercial Service:** These airports conduct regularly scheduled commercial flights and typically employ 30–200 or more individuals.

**Reliever and General Aviation (GA)-Regional:** These airports are typically without scheduled airline service and generally have fewer than 10 full-time employees.

**General Aviation (GA)-Community and Local Service:** These airports provide access to rural communities and areas in the Commonwealth not served by larger airports, and typically employ between zero and three full-time staff.

# SMP SUPPLEMENTS

Three Supplements and associated appendices provide sustainability planning guidance and suggested sustainability goals, metrics, targets, and initiatives relevant to the corresponding type and size of airport. The purpose of the Supplements is to ensure that airport operators have access to practical resources that are appropriate to the complexity of their airport's operations and that assist in advancing sustainability efforts while minimizing the burden on busy personnel and limited airport resources.



Orange County Airport terminal showing use of natural lighting



SMP Supplements for three categories of airports

The Supplements focus on implementation and tangible outcomes. Each one starts by introducing a set of the best existing tools and resources for overall sustainability planning at airports within the given category. This introduction is followed by a detailed examination of recommended sustainability goals, metrics, targets, and initiatives for airports in the type/size tier to consider within the sustainability categories of the SMP. For each of the 12 sustainability subcategories, the document presents one to three specific goals that are most relevant and meaningful for airport sustainability management. The document articulates the rationale for considering each sustainability goal, useful metrics for measuring progress, suggested numerical performance targets within each metric, and possible tangible initiatives to carry out in support of the goal.

The information presented in the Supplements is voluntary and intended to provide a menu of options for airports to consider. Individual airports are free to use the information contained in the Statewide Framework and the Supplements however they see fit to begin incorporating the concept of sustainability into the management of their facilities.

Economic Performance	Airport Community	Energy and Emissions	<b>Waste</b>	Natural Resources
Waste Management and Recycling		Chemical and Hazardous Waste Management		
<b>Goal 1: Reduce Municipal Solid Waste (MSW) sent to landfills.</b>				
<p><b>Rationale:</b> Reducing solid waste sent to landfills helps to reduce the production of methane, a greenhouse gas, which affects global warming 25 times more than carbon dioxide. Landfills can negatively affect the surrounding communities and leak contaminants into groundwater. Airports that are charged by waste management contractors for waste pickup by weight and/or frequency can benefit from reduced monthly costs.</p> <p><b>Suggested Initiatives:</b> Develop a waste reduction plan. The plan should be explicitly designed to meet the adopted MSW diversion target and to serve as a roadmap of long- and short-term strategies for reducing waste from the largest waste-generating operational functions. Conduct a municipal solid waste audit to determine contents of MSW, including the portion of the waste stream sent to landfills and the portion recycled (if applicable). This audit provides baseline data for establishing targets, developing accurate waste hauling contracts, and verifying the accuracy of existing and historical MSW volume reporting. Adopt waste hauling contracts that specifically require tracking and reporting of MSW volumes annually at a minimum. Revise existing contracts if needed. Provide incentives for accurate reporting. Leverage the airport's position as a major generator to encourage vendors to improve waste reporting across the industry. Adopt waste removal contracts that provide for recycling and composting services. Structure the contracts to provide specificity in the type of bins provided, visibility, location, number, destination, and reporting requirements. Create an internal task force dedicated to reducing the volume of waste the airport generates; the responsibilities of this task force may overlap with other related goals and initiatives.</p>		<p><b>Metrics:</b> MSW is defined as the total output of waste, not including hazardous waste or construction and demolition debris, produced by the airport.</p> <p>Pounds of MSW sent to landfill per year (i.e. not recycled or reused). Pounds of MSW generated per passenger per year, and disposed of at a landfill.</p> <p><b>Suggested Targets:</b> MSW generation and disposal volumes will vary between airports as a result of airport size, differing tenant waste removal agreements, and waste disposal contract structure and reporting requirements; target values for volume of MSW generated may vary accordingly.</p> <p>Decrease pounds of MSW sent to landfills by 15-30% of baseline year within eight years. Decrease pounds of MSW sent to landfills per passenger by a minimum of 8% of baseline year within eight years.</p>		

Section of SMP Supplement showing goal and associated metrics, targets, and initiatives

# ADDITIONAL GUIDANCE IN THE VIRGINIA AIRPORTS SMP

Appendices to the Supplements provide additional guidance on several key topics: identification of financial resources, engagement of various internal and external stakeholders, and collection and ongoing tracking of utility data. These topics are also discussed below and on the next page.

## GUIDANCE ON ENGAGING AIRPORT STAKEHOLDERS

Purposeful engagement of interested individuals and organizations both inside and outside an airport is important for any successful sustainability program. Each SMP Supplement includes a guide to sustainability-related stakeholder engagement, including practical advice on using social media to amplify an airport's online presence. The document contains simple and succinct guidance to help airports effectively engage with critical stakeholders when considering, developing, and implementing future sustainability initiatives and plans.

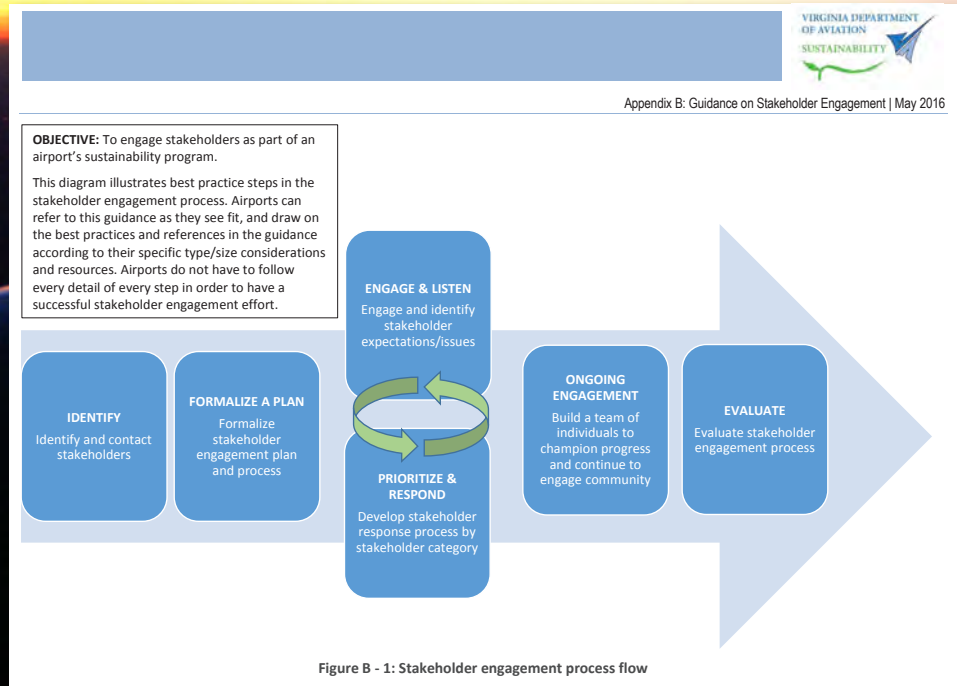


Figure B - 1: Stakeholder engagement process flow

Stakeholder engagement process diagram

## UTILITY PERFORMANCE TRACKING TOOL AND USER GUIDE

To support Virginia's airports in implementing sustainability initiatives, DOAV commissioned the creation of a Utility Performance Tracker Tool. The tool enables airports to easily track electricity, natural gas, and water use on a monthly and annual basis. The intended user is the party or individual who is responsible for sustainability or environmental reporting at the airport, has access to airport utility records, and can update the necessary utility data on a regular basis. The user guide that accompanies the Utility Performance Tracker Tool is included as an Appendix to each Supplement.

The Cadmus Group, Inc.

### Welcome to the Utility Performance Tracker

The Utility Performance Tracker is a tool for you to use for the purpose of tracking your organization's usage of energy and water usage. Using this tool, you will be able to track your usage, specify energy and water use reduction goals, and monitor your progress towards those goals.

**NOTE**  
This workbook requires Excel Macros to be enabled.

[First Time Setup](#) [Continue Using Tracker](#)

Click here to hide default Excel

Version 2  
Developed by The Cadmus Group, Inc.  
Version Date 5/9/2016

The Cadmus Group, Inc.

### Usage By Aircraft Movement

Start Date: 7/1/2014  
End Date: 3/1/2016

Electric	Minimum	5.32 kWh	\$0.59
	Average	53.73 kWh	\$3.93
	Maximum	83.82 kWh	\$5.26
	Total	1128.33 kWh	\$82.45

Sum of kWh Electric Usage Per Aircraft Movement

Natural Gas	Minimum	0.01 MCF	\$0.04
	Average	0.07 MCF	\$0.4
	Maximum	0.22 MCF	\$1.18
	Total	1.42 MCF	\$8.34

Sum of MCF Natural Gas Usage Per Aircraft Movement

[Return to Start Page](#) [Return to Previous Page](#)

Screen shots of Utility Performance Tracking Tool showing start page and example graphics



Program Name	Funder	Eligibility Criteria
<b>Energy Efficiency</b>		
VirginiaSAVES Green Community Program	Virginia Department of Mines, Minerals and Energy (DMME)	Recipients must be local governmental, non-profit institutional, or commercial or industrial businesses. Recipients must have sufficient credit to support financing through the program.
PACE Financing	Virginia Department of Mines, Minerals, and Energy (DMME)	Must be a part of a locality that has established a PACE Financing program.
Dominion Virginia Power - Non-Residential Energy Efficiency Programs	Dominion Virginia Power	Eligible applicants: Nonresidential Dominion customers.

*Section of Guidance on Funding Opportunities showing three energy efficiency funding sources and eligibility criteria*

## GUIDANCE ON FUNDING OPPORTUNITIES

Airports cannot necessarily rely on traditional funding sources, such as FAA programs or other aviation-related revenue streams, alone to sufficiently fund sustainability initiatives. Each SMP Supplement includes a “Guidance on Funding Opportunities” appendix that catalogues information on a variety of potential funding sources for airport sustainability projects. Sources are organized by sustainability category, and include information on the funder, program name, eligibility criteria, examples of eligible projects, form and quantity of available funding, and website for each. Types of funding include grants, loans, and tax credits, from sources including state, regional, and federal government agencies; nonprofits; and energy utilities.

With this document, airports have a curated list of potential funding sources to explore after selecting the sustainability initiatives they wish to pursue. The document also provides broader advice on how to explore partnerships with local governments, businesses, and other non-governmental organizations, and links to external resources on strategies to increase and diversify airport revenue.



*Stafford Regional Airport Terminal*

# SUSTAINABILITY MANAGEMENT PLANNING IN ACTION

During the development of the SMP, DOAV worked with three Virginia airports – Orange County Airport (OMH), Richmond Executive-Chesterfield County Airport (FCI), and Newport News/Williamsburg International Airport (PHF) – to “road-test” the tools, templates, and other resources contained in

the SMP Statewide Framework and Supplements. These case studies helped the project team refine and finalize the SMP material. Short descriptions of the case studies are below.



**Newport News/Williamsburg International Airport**, a Commercial Service airport, utilized the Guidance on Funding Opportunities in the SMP to match potential funding opportunities with ongoing sustainability initiatives at the airport, such as implementing stormwater management practices, construction material recycling, and water efficiency measures. Airport sponsors were able to identify funding sources for 25 of the 35 initiatives the airport was undertaking at the time or planning to undertake. In many cases, these mechanisms were non-traditional funding sources that airport decision makers previously did not know existed.



**Richmond Executive-Chesterfield County Airport**, in the Reliever/General Aviation-Regional size category, conducted a waste audit, which is one of the sustainability initiatives outlined in the SMP Supplement. The audit helped airport sponsors understand the airport’s waste mix and identify opportunities for recycling and composting. The audit revealed that the majority of the airport’s waste is generated by airport tenants rather than airport staff, suggesting that tenants should be a key participant in any recycling or composting program. As discussed in the SMP Supplement, the airport could encourage tenant participation in recycling by including recycling or composting requirements in lease contracts, operational requirements, or new building construction requirements.



**Orange County Airport**, in the General Aviation-Community/Local Service size category, explored the Virginia Airports SMP materials and chose to conduct a lighting audit, one of the recommended initiatives. The audit revealed that the simple payback for replacing light fixtures at the airport with more efficient lighting could be as short as 0.9 years. The audit also revealed that eight light fixtures could be upgraded with simple paybacks of less than three years, including the flood light on the wind sock, which could be replaced with a LED floodlight and save \$137 per year in electricity costs. Additionally, upgrading all of the CFL pin lights in the terminal with drop-in LED replacements would save over \$6,500 over 15 years – a meaningful sum given the size of the airport. Overall, the airport found numerous near-term savings opportunities in upgrading to more efficient lighting by utilizing the resources in the SMP.

## SUSTAINABILITY EFFORTS IN VIRGINIA TAKING OFF

Existing sustainability-related efforts at Virginia Airports include:

- ▶ “Project Green Skies,” a sustainability program at the Newport News/Williamsburg Airport
- ▶ A section on Sustainable Landscapes in the official Design Standards of Washington Dulles International Airport
- ▶ Installation of LED lighting, including taxiway lights and signage
- ▶ Implementation of “Fly Friendly” programs at many Virginia airports, to limit the surrounding community’s noise exposure, such as Reagan National Airport’s noise abatement procedures and operational guidelines for turbojet aircraft
- ▶ Adoption of local recycling programs
- ▶ Utilizing silviculture (controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society) rather than clear-cutting as a means to remove vegetative obstructions to Virginia airports
- ▶ Reuse of old airfield pavement as aggregate for new airport paving projects
- ▶ Shedding and recycling of vegetative debris to reduce solid waste

## KEY FINDINGS

The development of the Virginia Airports SMP reveals a number of key lessons for future airport sustainability planning efforts. These lessons learned should be of interest both to airport managers responsible for implementing sustainability practices, and to sustainability experts, regulators, and planners who seek to improve the processes through which airport SMPs are developed. Key lessons include:

- ▶ **Prioritize initiatives.** Some sustainability opportunities help realize near-term monetary savings, while others require longer timeframes. Feedback from case studies suggests that airport SMPs should include guidance on prioritizing initiatives and deciding between those that yield more immediate benefit and those with a longer payback period.
- ▶ **Engage airport tenants.** Discussions with airport staff underscored the important role that airport tenants play in an airport's overall consumption of resources, generation of waste, and production of emissions. Airport SMPs should provide guidance on how to integrate sustainability language into airport contracts with tenants, through restructuring or amending contracts. Additionally, the airports' individual SMPs should discuss the importance of airport owners "leading by example" so that sustainability initiatives trickle down to tenants.

- ▶ **Integrate sustainability with existing airport planning.** The case studies revealed that the SMP was most valuable when an airport approached it with the intent to integrate sustainability initiatives with other airport plans, such as an Airport Master Plan, Emergency Plan, Strategic Business Plan, or other related documents and checklists.
- ▶ **Leverage new construction projects.** Airport SMPs should emphasize that cost savings can be achieved in sustainability initiatives if they are implemented at the time of new capital construction. For example, if an airport is considering the construction of a new hangar building, that is the best time to consider installing rooftop solar photovoltaic cells, rather than after the building is already operational.
- ▶ **Build momentum for projects.** The sequencing of initiatives can be an important factor in building a strong airport sustainability program. One way to maximize success is to begin with projects that have many champions and a clear return on investment, and then move on to more involved initiatives by leveraging the momentum that was gained.

The development of DOAV's Sustainability Management Plan was funded by the U.S. Federal Aviation Administration (FAA) Airport Improvement Program (AIP) and the Virginia Department of Aviation (DOAV). The SMP Project was supported by a team of consultants led by The Cadmus Group, Inc.



CNG refueling station, Richmond International Airport



For more information, contact:  
Virginia Department of Aviation  
5702 Gulfstream Road, Richmond, VA 23250-2422  
804-236-3624  
[www.doav.virginia.gov/Sustainability.htm](http://www.doav.virginia.gov/Sustainability.htm)



This report was prepared by a team led by:  
The Cadmus Group, Inc.  
[www.cadmusgroup.com](http://www.cadmusgroup.com)