

TRANSPORTATION RESEARCH BOARD

Greener in two ways - Innovative sustainability solutions for airports

Monday, March 2, 2020
2:00-3:30 PM ET

Learning Objectives

At the end of this webinar, you will be able to:

- Identify drivers and outcomes of sustainability initiatives for smaller airports
- Assess the effectiveness of an airport's sustainability approaches
- Discuss how to harmonize an airport's sustainability and environmental processes
- Describe the tools available for sustainability planning



Burr Stewart

Burrst

- ✈ Airport Sustainability Plan Consultant
- ✈ Founding Chair, ACRP Synthesis Project Selection Panel
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Today's Speakers

Carol Lurie, VHB, Inc.

Presenting

ACRP Report 209: Integrating Sustainability Planning and
the Environmental Review Process

Daniel Prather, DPrather Aviation Solutions LLC

Presenting

ACRP Synthesis 69: Airport Sustainability Practices—
Drivers and Outcomes for Small Commercial
and General Aviation Airports

ACRP REPORT 209

Integrating Sustainability Planning and the Environmental Review Process



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- ✈ Regional Aviation Director, VHB
- ✈ Senior environmental and sustainability planner
- ✈ Directed over a dozen sustainability plans for airports and states
- ✈ Founder member of Sustainable Aviation Guidance Alliance



ACRP Report 209 Oversight Panel

Arlyn Purcell, Port of Seattle

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Jim R. Halley, III, Florida DOT

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Christine Gerencher, Transportation Research Board

Joseph Navarrete, ACRP Senior Program Officer

Problem Statement

- There are overlaps between airport environmental reviews and sustainability initiatives, but these efforts have not been well integrated
- Airport industry practitioners are interested in gaining a better understanding of the benefits of integrating environmental review with sustainability planning, and would like strategies and tools to help them implement this integration

Learning Objectives

- ✈ Overview of Opportunities
- ✈ How to Integrate Sustainability into the Environmental Review Process?
- ✈ How to Leverage the Environmental Review Process to support Sustainability Planning?
- ✈ What Tools and References are available?
- ✈ What are the Key Takeaways?

Research Project Goals and Audiences

Goals

- ✈ Demonstrate the **opportunities** in which the sustainability planning process and the environmental review process overlap and enhance each other and provide suggestions on how to integrate information and concepts between the two

Target Audiences

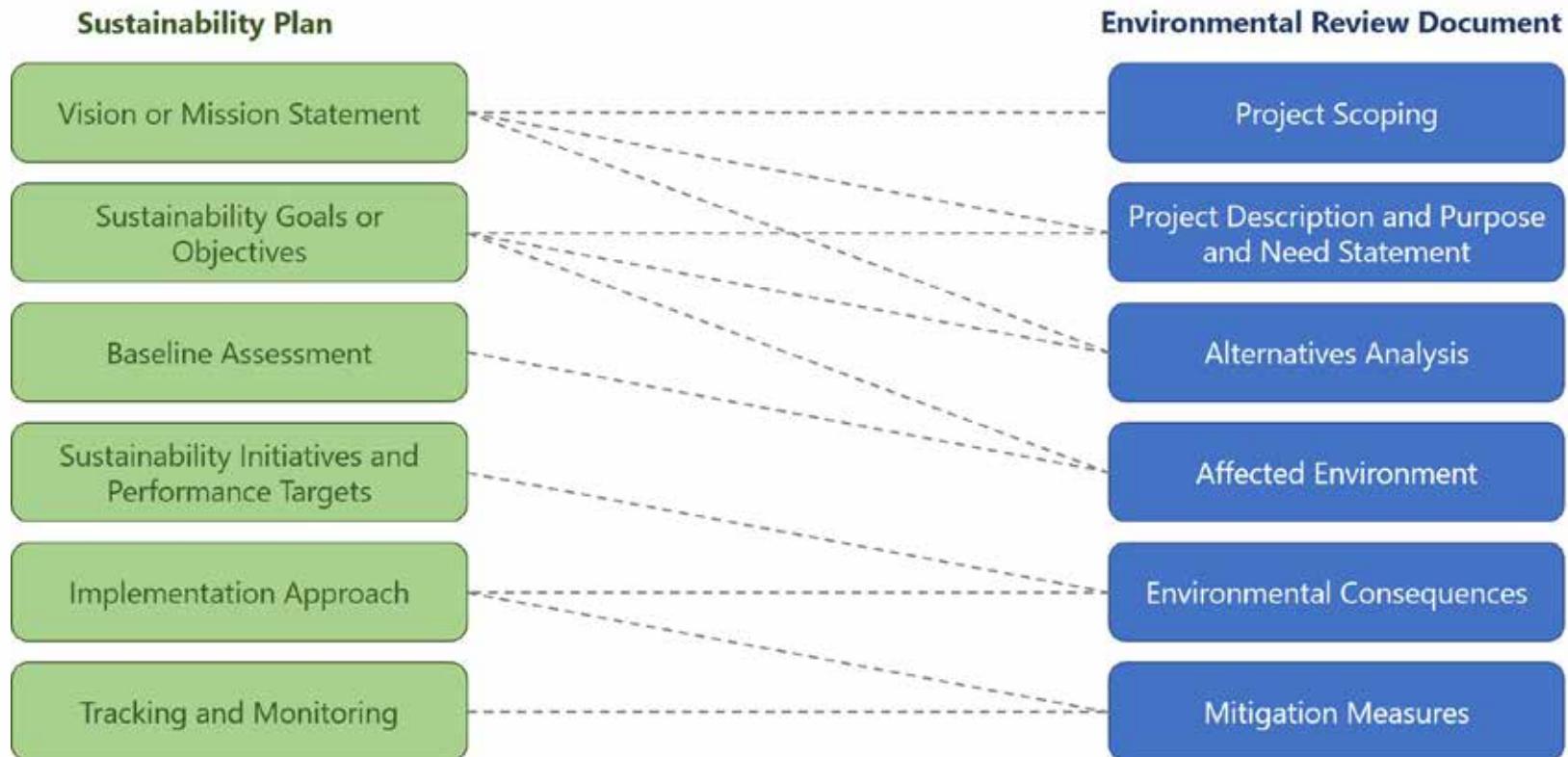
- ✈ Airport managers, planners, or other staff engaged in sustainability initiatives and/or environmental reviews
- ✈ Airport consultants or government agency staff engaged in sustainability initiatives and/or environmental reviews
- ✈ Regulators

Guidebook Contents

Guidebook Outline

- Chapter 1: Introduction to the Guidebook
- Chapter 2: How to Integrate Sustainability Planning into the Environmental Review Process
- Chapter 3: How to Leverage the Environmental Review Process for Sustainability Planning
- Chapter 4: Tools and Resources

Environmental Review – Sustainability Planning Process Alignment



Integrating Sustainability Planning into the Environmental Review Process



Project Planning – Sustainability Considerations

Project Planning	Sustainability Considerations
Project Development/ Conceptual Planning	<ul style="list-style-type: none">- Does the project meet a sustainability goal set by the airport?- Is the purpose of the project to make the airport more sustainable?- Does the proposed project include sustainable elements such as energy or water conservation measures, renewable energy infrastructure, or use of renewable construction materials?
Scoping/ Purpose and Need	<ul style="list-style-type: none">- Does the airport have a sustainability mission, vision statement, or policy?- Does the proposed project goal align with this document? Does it conflict with this document?- What does the airport already have in place as far as any sustainability-related plans, goals programs, or initiatives?- In what way(s) might the project contribute to the airport's overall sustainability?- What are the potential implications (costs, logistics, etc.) of the project with regard to sustainability considerations?

Common Challenges and Questions

- ➔ Can airports integrate sustainability planning into an environmental review without expanding scope
- ➔ Disparate durations and scopes between sustainability planning efforts and environmental reviews
- ➔ Integrating sustainability planning into an environmental review without a sustainability program or goals
- ➔ Adopting a consistent and replicable approach to integrating sustainability planning and the environmental review process
- ➔ Aligning sustainability planning and environmental review resource categories

Integrating Sustainability Planning into the Environmental Review Process

NEPA Environmental Review Category	Sustainability Category ¹	NEPA and Sustainability Synergies
Air Quality Climate	Energy and Climate Human Well-Being Air Quality Improvement	<ul style="list-style-type: none">Minimizing air pollution emissionsReducing GHG emissions/energy useResiliency to changing climate conditions
Biological Resources Coastal Resources Historic, Architectural, and Cultural Resources Section 4(f) Resources	Natural Resources Human Well-Being Resiliency	<ul style="list-style-type: none">Protecting natural resources (habitat, species, etc.)Minimizing or avoiding environmental impacts (to coastal resources—habitat, species, etc.)Efficient land uses that minimize environmental impacts and promote social well-being and economic developmentProtection of historically and culturally significant landmarksProtection of green and open space
Ground Transportation	Ground Transportation Human Well-Being Air Quality Improvement	<ul style="list-style-type: none">Efficient and equitable transportation modes that minimize air pollution and GHGs
Hazardous Materials, Solid Waste, Pollution Prevention	Water and Waste Management Design and Materials Natural Resources	<ul style="list-style-type: none">Reduction of wasteDiversion of materials from landfillsProductive reuse of materialsSustainable, efficient procurementSafe handling of materials

NEPA Categories – Sustainability Categories

NEPA Environmental Review Category	Sustainability Category ¹	NEPA and Sustainability Synergies
Natural Resources and Energy	Climate and Energy Natural Resources	<ul style="list-style-type: none">• Improved energy performance and operational efficiency
Noise and Noise-Compatible Human Well-Being	Human Well-Being Noise Abatement	<ul style="list-style-type: none">• Minimizing noise impacts
Socioeconomics (Environmental Justice and Children's Health and Safety)	Economic Performance Human Well-being Passenger Experience Community	<ul style="list-style-type: none">• Promotion of employee health and well-being• Equity and community health• Minimization or avoided negative impacts on surrounding communities
Visual Effects	Design and Materials Passenger Experience	<ul style="list-style-type: none">• Sustainable and resource-efficient design and materials
Water Resources	Water and Waste Natural Resources	<ul style="list-style-type: none">• Pollution prevention of water sources• Water conservation

Mitigation – Sustainability Implementation



- ➔ Include sustainability measures as part of the NEPA mitigation commitments – memorialized as part of the FAA determination such as a Record of Decision
 - vs.
- ➔ Keep sustainability measures out of mitigation commitments to separate out costs



Case Studies

- 2015 San Francisco International Airport (SFO) Administrative Facilities—FEIR Addendum
- Philadelphia International Airport (PHL) Capacity Enhancement Project EIS and Stewardship Plan
- Boston Logan International Airport (BOS) Environmental Data Reports and Environmental Status and Planning Reports
- Portland International Airport (PDX) Community Advisory Committee's Focus on Sustainability



Leveraging the Environmental Review Process to Enhance Sustainability Planning



Sustainability Planning Activities

- Sustainability Master Plans
- Sustainability Management Plans or Sustainability Plans
- Resource-specific plans or programs
- Individual projects or initiatives



A graphic featuring the "MASSPORT" logo (a stylized blue swoosh) above the text "INTERNATIONAL AIRPORT". Below this, a white rectangular box contains the text "Sustainability Master Plan" in blue.

The cover of "ACRP SYNTHESIS 77: Airport Sustainability Practices". The title is at the top in large blue letters. To the right is a vertical purple sidebar with the text "AIRPORT COOPERATIVE RESEARCH PROGRAM" and "Sponsored by the Federal Aviation Administration". The main body features a collage of images related to airport sustainability, including a luggage cart, a truck, and various documents. At the bottom, it says "A Synthesis of Airport Practice" and lists "COUNCIL OF TRANSPORTATION RESEARCH BOARD" and "The National Academies of SCIENCES • ENGINEERING • MEDICINE".

Enhancing Sustainability Planning

Previously Completed Environmental Reviews

Previous reviews may contain information that is useful in preparing the Sustainability Plan.

Sustainability Plan

The plan presents information in an easily accessible format for future environmental reviews.

The plan incorporates relevant information from previous environmental reviews.

Reasonably Foreseeable Environmental Reviews

Future reviews will be able to refer to the Sustainability Plan for useful information.



Common Challenges and Questions

- Coordination and communication gaps
- What if the airport does not have any recently completed or upcoming projects requiring environmental review?
- “Green Washing”
- How does the project team balance project-focused environmental reviews with airport-wide sustainability planning efforts?

Case Studies

- ✈ Port Authority of New York and New Jersey (PANYNJ) Sustainability Mitigation
- ✈ Massport Sustainability Management Plan Sustainability Initiative Form



Tools and Resources



Tools

Quick Start Guide

- ➔ Planning
- ➔ Communication
- ➔ Policy
- ➔ Procedures
- ➔ Public and Agency Engagement
- ➔ Existing Tools and Resources (Links)
- ➔ Rating Systems
- ➔ Leadership in Energy and Environmental Design (LEED)
- ➔ Parksmart
- ➔ Envision

Checklists

- ➔ Sustainability Resources to Consult When Preparing an Environmental Review
- ➔ Environmental Review Resources to Consult When Preparing a Sustainability Plan
- ➔ Sustainability Aspects to Consider within Each Environmental Review Section
- ➔ Strategic Planning: Integrating Sustainability Planning and the Environmental Review Process

Checklist 4. Strategic planning: integrating sustainability planning and the environmental review process.

Strategic Aspect	Action
<input type="checkbox"/> Interdepartmental coordination	Coordinate with all airport departments to identify current and planned capital projects and current and planned sustainability programs, projects, or initiatives; open lines of communication regarding integration approach.
<input type="checkbox"/> Policy statement	Consider adopting a policy statement (or amending an existing policy), stating intent to align sustainability planning and environmental or regulatory reviews.
<input type="checkbox"/> Planning and review procedure	Develop or amend a procedure for how airport staff or airport consultants should prepare environmental reviews or carry out sustainability planning in a manner that integrates the two.
<input type="checkbox"/> Stakeholder support	Engage with internal and external stakeholders to explain the integration approach and expected outcomes; seek feedback and recommendations.
<input type="checkbox"/> Communication	Clearly communicate the intent to produce documents that integrate sustainability planning and the environmental review process; ensure federal liaisons and cooperating agencies are aware of this intent and that such integration will be consistent with existing regulatory requirements.

Key Take Aways

- ➔ Explore opportunities to update relevant airport policies and procedures to ensure that sustainability considerations are included and implementation is consistent
- ➔ Governance and communication are key
- ➔ Develop mechanisms such as the following:
 - § Open communication channels among various departments
 - § Clear planning strategies and implementation procedures
 - § Educate airport staff in different approaches to both sustainability planning and environmental reviews

Key Take Aways

- ➔ Consider sustainability elements as early as during the proposed project's planning and conceptual design phases
- ➔ Framing the project benefits through a sustainability lens may help improve buy-in, potentially making the review process less contentious, while maintaining a positive community relationship
- ➔ Conduct robust internal outreach to ensure that all ongoing sustainability-related initiatives are identified and considered in environmental reviews
- ➔ Continue to follow the step-by-step approach defined in environmental review regulations

Key Take Aways

- ➔ Develop a general idea of the airport's current state of capital projects and recently completed and upcoming projects
- ➔ Consider key findings or commitments from previously completed environmental reviews
- ➔ Understand that sustainability plans and programs should be seen as guiding frameworks for sustainability, whereas specific projects (including those requiring environmental review) are where these frameworks get implemented and where sustainability improvements truly get realized

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Airport Sustainability Practices – Drivers and Outcomes for Small Commercial and General Aviation Airports

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ACRP Synthesis 69 Oversight Panel

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ACRP Synthesis 69, Airport Sustainability Practices – Drivers and Outcomes for Small Commercial and General Aviation Airports

- ➔ Identifies the benefits of sustainability.
- ➔ Considers the costs of sustainability.
- ➔ Reviews the concept of sustainability plans.
- ➔ Presents sustainability guidelines and resources.
- ➔ Identifies small airport considerations.
- ➔ Published 2016.

Introduction to Research Problem

- ➔ Common belief that sustainability refers only to environmental sustainability.
- ➔ Common belief that sustainability is inherently costly.
- ➔ A need existed to better understand the types of sustainable initiatives adopted by small airports and the current guidance on sustainability.

Approach to Address the Problem

- Extensive review of available literature.
- Survey sent to 340 randomly selected GA, reliever, and nonprimary commercial service airports.
- Phone interviews with select airports for development of case examples.
- 303 responses (89%).

Research Results

- ✈ 63% of small airports have adopted one or more sustainable initiatives.
- ✈ Most common categories of initiatives:
 - § Energy conservation/renewable energy (82%)
 - § Water quality protection and conservation (42%)
 - § Materials use and solid waste reduction/recycling (36%)
 - § Hazardous materials and waste management/reduction (18%)

Statement	% Agree	% Disagree
I am familiar with the triple bottom line.	55	44
Our airport has little impact on the environment.	96	4
Environmental sustainability is not a priority for us.	89	8
Environmental sustainability costs too much.	86	2

Case Examples



Case Example 1: In-Kind Contributions, Piggott (AR) Municipal Airport

- Airport contributed 5% or 10% match to state grants as in-kind contributions.
- Donated heavy equipment operated by airport volunteers (Airport Board members).
- Lessons learned:
 - § Partner with granting authority early to determine acceptability.
 - § Insist on volunteers with skills.
 - § Partnering with a contractor is more likely for rural airports.
 - § Final project cost is lower with in-house personnel.

Case Example 2: Statewide Sustainability Toolkit, Colorado DOT-Aviation

- Web-based platform for Colorado's GA airports to develop customized airport sustainability plans.
- Lessons learned:
 - § Many small airports are not aware of the value of a sustainability plan.
 - § State platform introduced economies of scale.
 - § Sustainability must be easy for airports to adopt.
 - § Interest in sustainability grows as airports share successes with peers.

Airport Data

Choose the EONS category for which you wish to view a summary:

[Click Here to View Action Plan](#)

Social Responsibility ▼ Dashboard Data (select a Focus Area)

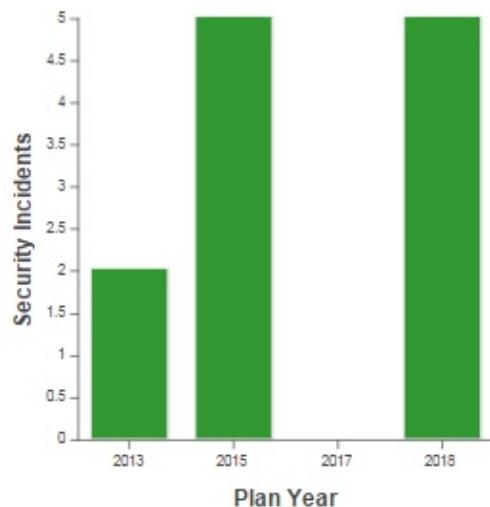
Year over Year Snapshot - Aiport Data

Data Element	2013	2014	2015
Noise Complaints	2	205	
User Complaints	2	6	
Community Collaboration/Events	4	10	
Security Incidents	2	5	
Internships?	No	No	No

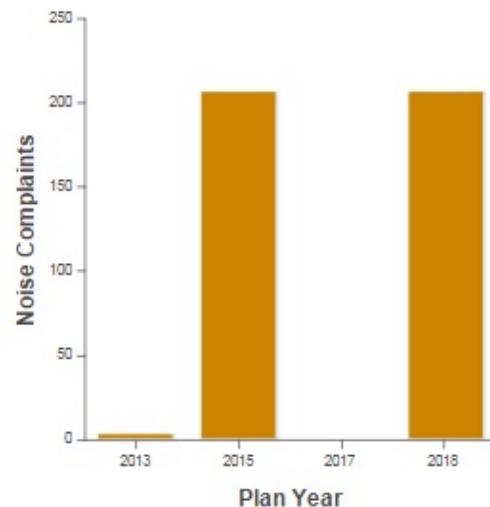
Graph Data Not Showing? Click here to Refresh your Dashboard:

[Refresh](#)

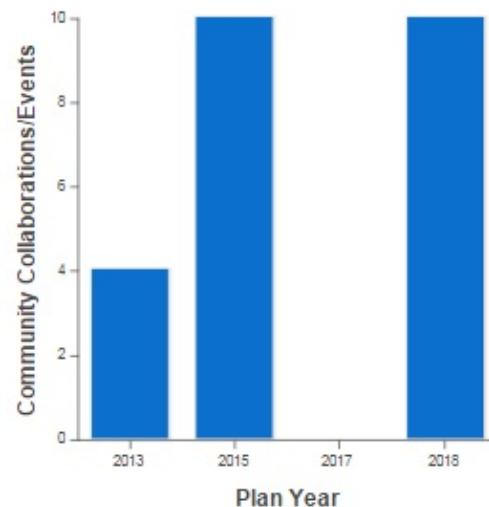
Year Over Year Security Incidents



Year Over Year Noise Complaints



Year Over Year Total Community Collaborations/Events

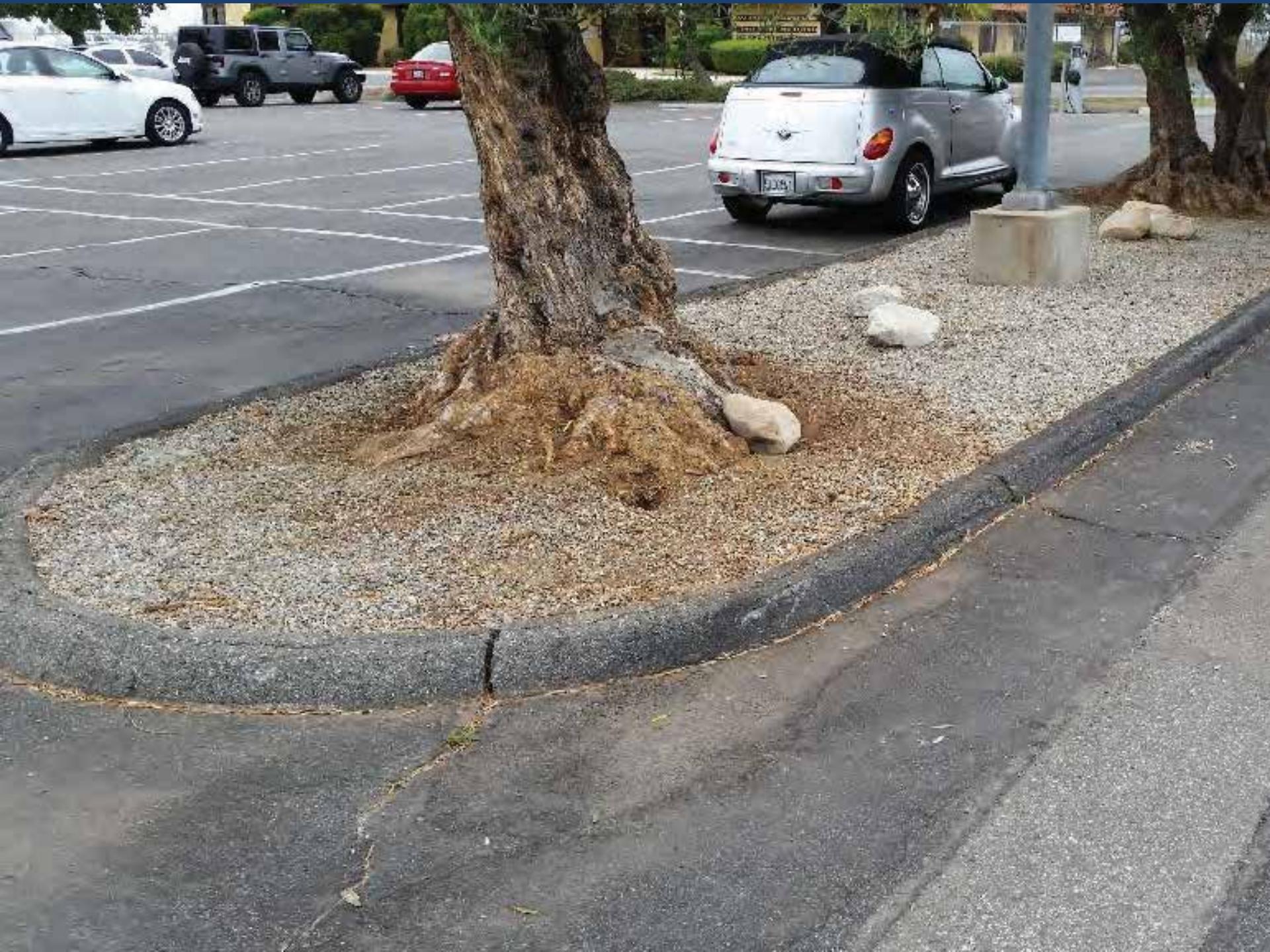


Case Example 3: Electric-Diesel Utility Vehicles & Terminal Retrofit, Monroe County (IN) Airport

- Purchased one electric golf cart and two small, diesel-powered utility vehicles.
 - § Full-size gasoline-powered pick-up trucks were replaced by these more efficient vehicles.
- Water heater that supplies hot water to the food and beverage concessionaire was replaced with tankless water heater.
 - § Lower water use to generate hot water and reduced natural gas use.
- Interior insulation and drywall added to concrete block walls of exiting terminal building to enhance energy efficiency.
- Lesson learned:
 - § These initiatives actually reduced airport costs and enhance the bottom line, while benefitting the environment.

Case Example 4: Efficient Lighting and Hardscape Installation, Riverside (CA) Municipal Airport

- ➔ Replaced 39, 400-watt ramp light fixtures with 39, 152-watt LED fixtures.
 - § Improved light output and reduced energy consumption
- ➔ Motion sensors installed in interior offices to minimize lighting and energy use in vacant offices.
- ➔ Significant areas of grass and vegetation removed and replaced with hardscape (such as gravel).
- ➔ Lessons learned:
 - § If an initiative produces greater benefits than costs, the airport is obligated to pursue it.
 - § Consider performing work in-house, either with airport or city/county labor to reduce payback time.



Case Example 5: Multiple Measures, Eastern Sierra Regional (CA) Airport

- Recycling.
- Installed double-paned windows and energy-efficient fluorescent lighting.
- Installed interior motion sensor lighting.
- Installed LED lighting on the airfield.
- Installed pilot-controlled lighting to minimize energy use during the nighttime hours when airfield lighting is not being used.
- Lessons Learned:
 - § As an item or piece of equipment reaches the end of its useful life, "Is there a more efficient replacement?"
 - § Hire personnel who are skilled in multiple areas to enable more in-house work.

Case Example 6: LEED Equivalency, College Park (MD) Airport

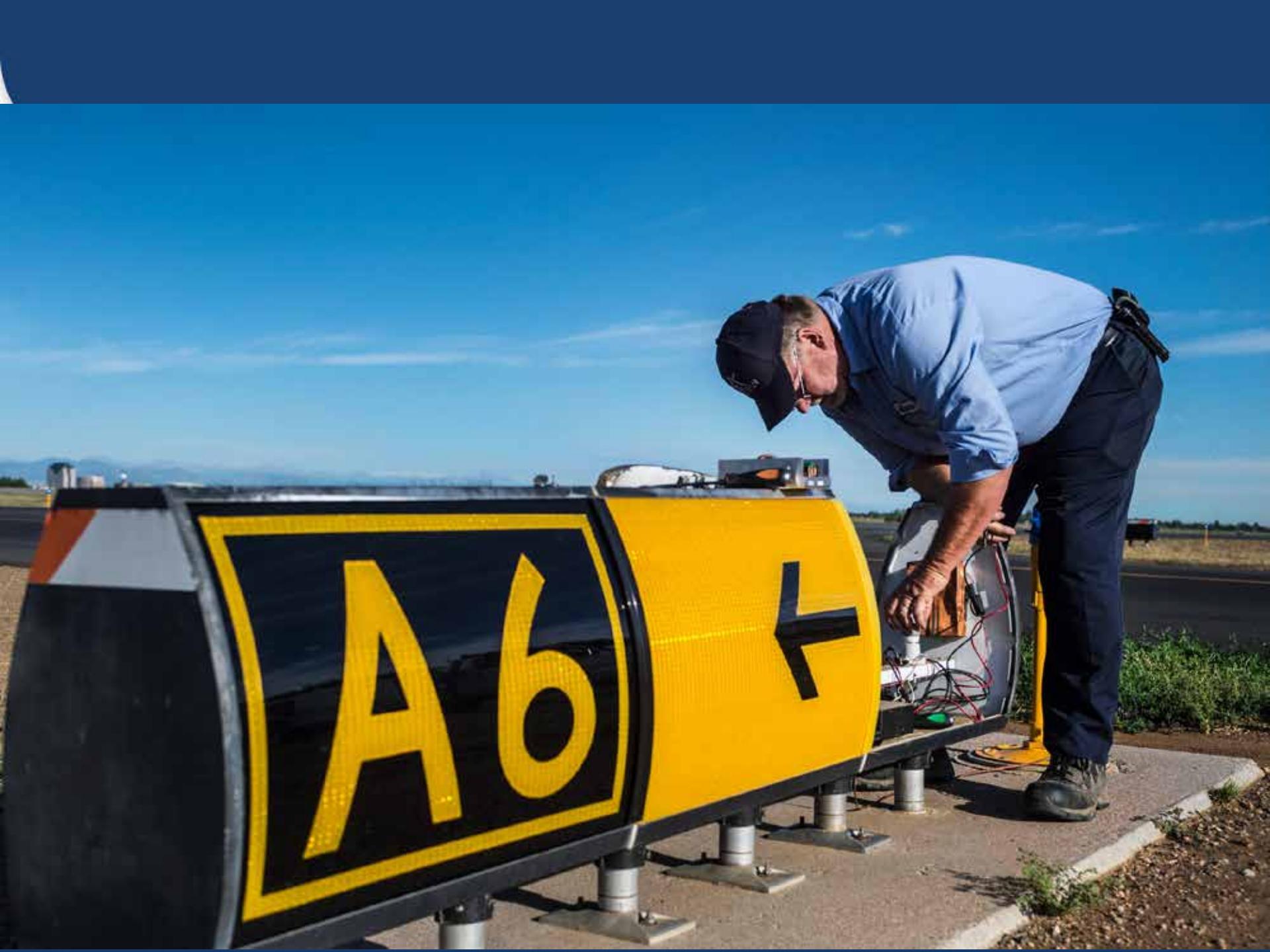
- ✈ New airport operations building was designed to LEED (Leadership in Energy & Environmental Design) Silver equivalency.
- ✈ Although the new building was designed to LEED Silver standards, the airport did not pursue LEED certification due to the cost.
- ✈ The building uses ultra-efficient HVAC, energy-efficient windows, energy-efficient lighting, sustainable building materials, trash and recycling receptacles for separation of materials, low-flow toilets and water fixtures, and a vegetative roof.
- ✈ A filtration pond was created and lined with native grasses to allow storm water to recharge the groundwater aquifer.
- ✈ Lesson learned:
 - § “With so many building products now made sustainably and from renewable sources, you can’t help but use them.”

Case Example 7: Photovoltaic Solar Field, Chautauqua County/Dunkirk (NY) Airport

- No-cost to the airport.
- Land for the photovoltaic (PV) panels will be leased at fair market value (to comply with grant assurances).
- Solar contractor received New York State Public Service Commission solar subsidies and sells power generated to the local utility at a subsidized, profitable rate. The airport benefits by lower electricity rate from the utility.
- Lessons Learned:
 - § Many solar subsidies and various utility rebates have restrictions that require close attention and coordination between the contractor and the entity providing subsidies.
 - § Perform a glare analysis prior to installation.

Case Example 8: LED Airfield Lighting, Centennial (CO) Airport

- ➔ Transitioned all internally illuminated airfield signage from incandescent to LED; replaced all taxiway lighting with LED; plans to transition runway lighting to LED.
- ➔ Lessons Learned:
 - § Small test area of LED lights on the airfield without supplemental heater coils revealed that the lights would perform well without supplemental heater coils, thus saving on installation and ongoing energy costs.
 - § LED lighting is significantly brighter than incandescent or quartz lamps, and if part of the airfield is LED and part is not, pilots will notice the difference.
 - § “Not only is it good for the environment, but it is actually going to save the airport money.”



Case Example 9: Photovoltaic Solar Field, Lakeland Linder Regional (FL) Airport

- ➔ Through a public–private partnership between the city of Lakeland and the local utility company, a 40 acre solar field of more than 18,000 solar panels was installed on-airport.
- ➔ In exchange for airport land, the airport receives energy credits at a rate of \$0.02/kWh, generating nearly \$250,000 annually for the airport.
- ➔ Lessons Learned:
 - § There can be unintended environmental impacts associated with the construction of environmentally friendly projects.
 - § Public–private partnerships can make large-scale sustainable projects affordable.
 - § Consider airport land that may not be beneficial for aviation use but could be used for renewable energy projects.



Case Example 10: Photovoltaic Solar Field and Rotating Beacon, Smyrna/Rutherford County (TN) Airport

- Photovoltaic solar field installed, which generates 1,000-kW of energy into the grid of the Middle Tennessee Electric Membership Corporation.
- This solar field was partially funded by the Tennessee Valley Authority (TVA) Generation Partners program, resulting in zero costs to the airport.
- The solar contractor maintains the system, with access required two to three times annually for system maintenance.
- Lesson Learned:
 - § “This land was doing nothing but growing trees, and it made sense to generate revenues, while also providing environmental benefits.”



Case Example 11: Reclaimed Water, Livermore (CA) Municipal Airport

- Airport is located adjacent to water treatment plant that produces thousands of gallons of treated water monthly.
- Because of water pressure requirements, the reclaimed water is effectively provided in only a 2- to 3-mi radius from the treatment plant.
- Airport benefits by using reclaimed water to irrigate airport land, including more than 100 acres of adjoining golf course owned by the city.
- On-airport fire hydrants also utilize reclaimed water.
- Lesson Learned:
 - § Airports “need to encourage thought on sustainability and be willing to think outside the box.”



Case Example 12: Sensitive Environment, Ocean County (NJ) Airport

- ➔ The airport is uniquely located within the Pinelands National Reserve, a 1.1-million-acre environmentally protected region.
- ➔ When a new 3,599-ft crosswind runway (part of the 1960s Master Plan) was proposed, the approval process before ground could be disturbed took 5 years.
- ➔ Airport was required to relocate sickle-leaved golden aster.
- ➔ Airport was required to build snake dens to benefit approximately 20 species of snakes that inhabit the Pinelands.
- ➔ Lesson Learned:
 - § “Small airports should know and understand their significant stakeholders and partners and keep communication lines open.”
 - § “If an area doesn’t need to be disturbed, don’t disturb it.”



Case Example 13: Honeybees, Jackson County (TN) Airport

- Airport is adjacent to the Cumberland River, in a rural area, on land leased from the Army Corps of Engineers.
- 100 acres of clover, mostly in a river bottom area, with no honeybees, insects that play a significant role in pollination.
- The colony cost approximately \$500 to establish (hive and bees), and with a ready source of water (Cumberland River), the colony was set up in a remote location on airport property.
- Lessons Learned:
 - § All airports with a remote land area and available source of water should consider such an initiative and contact a local beekeeper for advice.
 - § Once established, maintenance of the colony is low, with regular visits to the hive by a beekeeper.



Case Example 14: Recycling, San Bernardino (CA) International Airport

- During past runway and taxiway rehabilitation and repaving, the airport retained removed concrete, crushed it, and stored it on airport property to use as base for other projects.
- The crushed concrete also can be sold if not needed by the airport.
- Lessons Learned:
 - § “Most small airports are part of a city or county that has resources that may be made available to the airport. Most small airports could ‘piggyback’ on these existing programs.”



Conclusions: Moving Toward Sustainability

- ➔ Learn about the airport's true environmental footprint.
- ➔ Learn about available funding opportunities.
- ➔ Learn about the EONS approach to sustainability.
- ➔ Learn about low-cost sustainability measures.
- ➔ Learn about payback periods and cost/benefits.
- ➔ Consider first pursuing low-hanging fruit, such as:
 - § Minimize turf
 - § Use reclaimed water for irrigation
 - § Install motion sensor on lights
 - § Install low-flow toilets
 - § Install tankless water heater
 - § Use recycled paper

Action Step

- ✈ Take the first step.
- ✈ Do something to benefit:
 - § Economic viability
 - § Operational efficiency
 - § Natural resource conservation
 - § Social responsibility

FOR ADDITIONAL INFORMATION



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[http://www.trb.org/Publications/Blurbs/
174223.aspx](http://www.trb.org/Publications/Blurbs/174223.aspx)

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Synthesis 93: *Sustainability's Role in Enhancing Airport Capacity*

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