

Chicago Department of Aviation Sustainable Airport Manual Planning Chapter

Definition of Sustainable Airport Planning

Sustainable Airport Planning (SAP) is the large-scale conceptual planning of the physical environment that facilitates implementation of design, construction, and/or operation in a sustainable manner. SAP is an ongoing, pervasive pursuit that establishes qualitative and quantitative goals for all project sizes at the earliest stage based on stakeholder collaboration and commitment.

Purpose of Sustainable Airport Planning

SAP provides guidance and support in developing, maintaining, or increasing the performance of sustainable initiatives within the overall framework of an airport's sustainable master plan. SAP considers sustainable design concepts throughout the SAM in planning airport development projects and programs from inception, thereby increasing the ability of each project to meet and to hopefully exceed various SAM initiatives based on each airport's optimal conditions. Moreover, the inclusion of sustainability considerations at the planning stage will usually result in greater benefits and lower costs than the addition of sustainability features at a later date.

Blueprint for Sustainable Airport Planning

Virtually all projects begin with the development of a plan. That plan may be a major program, such as an airport master plan, or it may be a relatively small improvement, such as the addition of a new jet bridge. Sustainability considerations and goals need to be integrated into the planning process, just like costs and schedules. Integration of sustainability considerations into the planning process sets the groundwork for inclusion of sustainability features as a project proceeds through the design, implementation, and operational stages. Without an overall vision of sustainability at inception, one can not hope to achieve success.

More Than EMS: An Environmental Management System (EMS) is an organization's management process to measurably improve its environmental performance. The EMS process involves a continuous cycle of planning, implementation, revision, review, and policy formulation. Many organizations will cite an EMS as evidence of working within a framework toward sustainability. However the direct link between EMS and SAP is not always clear. Sustainable activities fall into two categories: If the initiative does not violate any of the system conditions, then it is an *eco-effective* activity; if it violates any of these system conditions, but makes some sort of incremental improvement in an unsustainable activity, then it is *eco-efficient*. The difference between eco-effective and eco-efficient is a critical differentiator in a true sustainability plan. All organizations should make incremental steps toward their goals, but an EMS dominated by eco-efficient initiatives will not bring an organization to true sustainability.

Understand Sustainable Principles and Strategies: In a sustainable system, human needs are met, but nature is not subject to systematically increasing concentrations of substances extracted from the earth or produced by society; nor is nature subject to physical degradation or depletion. Taking that a step further, some environmental and planning experts point to “regeneration” as the ultimate manifestation of sustainability. In any case, the inclusion of sustainability into an organization’s plan recognizes that earth, air, water, and mineral resources are finite. For airport operations to continue to be eco-effective in the long term, minimizing consumption and sustaining or regenerating natural resources will insure that an airport can continue to operate successfully and grow as needed. The alternative is stagnation or even failure in the long run as resources deplete, competitiveness slips, and quality of life decreases.

Although these central principles of sustainability are non-negotiable, the activities an airport undertakes as a response to sustainability are negotiable and represent the best that organization can do under its current situation. It is certainly recognized that in a modern society, sustainability must be balanced with economic and social concerns. The net value of this optimum balance based on a system’s conditions is known as the airport’s “triple bottom line”. Many airports often struggle with the daily reality of their economic and social concerns, like balancing limited budgets or satisfying customer demands, where sustainability opportunities can be overlooked. SAP takes a broad integrated approach, customized to organizational and system conditions and shaped by input from stakeholders. Once system conditions (and options) are defined and understood, an airport can then look to one or more sustainability strategies for inspiration. Four key SAP strategies are:

- Radical Resource Productivity (more utility from less resources)
- Biomimicry (nature as a model, measure, or mentor for modern life)
- Service and Flow Economy (less consumption through re-use)
- Investment in Natural Capital (prioritize the value of ecology)

Develop a Sustainability Schematic: With a better understanding of sustainability principles and strategies, the implementation of sustainability initiatives, despite the best of intentions, can still face challenges because people focus on considerations or goals without a full understanding of the objectives or processes involved. When an organization pursues a sustainability plan, the most effective method is to develop a *sustainability schematic*, which includes:

- Empirical observations, rules, and facts
- Scientific matters
- Strategy goals and minimum thresholds
- Procedures and incentives
- Key performance indicators and quantifiable metrics
- Tools and resources
- Assessment/monitoring/feedback
- Results and outcomes

When developing a sustainability schematic, an large organization like an airport might primarily focus on actions by the owner or operator. However, policies that influence or educate the user (passenger) to change behavior toward sustainability is also a vital part of the equation. Some basic examples of motivating the airport customer are prominent

recycling programs, priority parking for alternative fuel vehicles, and inexpensive and efficient public transit to the airfield.

Apply Sustainability Processes: Using a sustainability schematic, airports can then utilize or organize various internal and external processes to work toward sustainability. A process or processes may be applicable to different organizations at different times for different projects, but when used within a sustainability schematic, synergies are more easily identified and realized. One example of a successful holistic sustainability schematic for a large airport is a flow chart developed by Dallas/Ft. Worth International Airport (see DFW “PDP” exhibit). Other prominent processes that can support an airport’s sustainability schematic are:

- Life cycle assessment (LCA)
- Design for the Environment (DFE)
- Ecological Footprinting (EF)
- Sustainable procurement guidelines
- ISO 14001 standards
- Sustainability Management Systems (SMS)
- Sustainable Airport Guidance Alliance (SAGA)
- LEED
- EMS

Assure a Broad Approach: SAP processes can aggregately elevate everyday planning to proactively address environmental issues beyond minimum standards and embrace sustainability as an important achievement. SAP can achieve all of the required elements of the standard planning process, but with enhancements that will benefit the airport and the surrounding region with minimal additional costs, significant net savings, and triple bottom line optimization. Important SAP elements that should be encompassed by a sustainability schematic and related processes include:

- Sustainability objectives and target goals
- Energy use and atmospheric impact
- Fleet and vehicle operations
- Material and resource use
- Heating and cooling systems
- Lighting systems
- Construction and administrative procedures
- Indoor quality of life
- Air quality enhancement and energy use carbon emissions inventory
- Waste management and recycling
- Landscape and natural resource management
- Design and development alternatives and innovations
- Noise abatement
- Surface transportation management
- Water efficiency, quality, and conservation
- Green building and asset management
- Sustainability baseline assessment
 - Emissions inventory

- Electrical usage
- Greenhouse gas inventory
- Water usage
- Stormwater discharges
- Waste disposal volumes and destinations
- Recycling programs
- Indoor environmental quality
- Cleaning and maintenance programs

Even with a broad, well-developed approach to SAP that details strategies, schematics, and processes, SAP itself should be considered a sustainable concept: An airport should constantly ask, “Is there more we can do, or can we do things better?”.

SAP also values Regional Priority (SAM Chapter 9), which provides an incentive for the achievement of credits that address geographically-specific environmental priorities. An airport can earn credits identified by the USGBC (<http://www.usgsb.org>) as having environmental importance for a project’s region. Such a large-scale effort sets an important foundation for more localized or specialized elements, projects, and objectives of sustainability.

Summary Guide for Sustainable Airport Planning

SAP should begin at the earliest stages of airport planning and, thus, become part of the sustainable fabric and vision that influences later stages of design, construction, and/or operation for projects large and small. Early incorporation will usually result in the greatest benefits at the lowest costs. Understanding the needs and limitations of each airport’s stakeholders and system conditions is also an important part of effective SAP in order to achieve long term eco-effective sustainability. The first step is reviewing the true meaning of sustainability. Then an airport should study its optimum triple bottom line, which will vary based on its system conditions and unique situations. From here, an airport can choose one or more SAP strategies to develop a sustainability schematic, a vibrant model which should substantially affect the airport’s development and operation and which can encompass various sustainability processes. A good sustainability schematic will comprehensively cover the many elements of sustainability, as outlined in the SAM for example. In a nutshell, the constant flow of SAP becomes a critical component to elevate and achieve airport sustainability with maximum efficiency.