The City of Portland would like to thank the individuals and organizations who participated in the development of the Portland International Jetport Sustainable Airport Master Plan.

**PLANNING ADVISORY COMMITTEE**

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In recognition of its historical and ongoing commitment to sustainability, the Jetport received a grant through the Federal Aviation Administration's Sustainable Master Plan Pilot Program to support the Sustainable Airport Master Plan (SAMP). With its first official sustainable master plan, the Jetport is taking the next step toward full sustainability integration and is recognizing the potential to improve its overall operating efficiency in a fiscally, environmentally, and socially responsible manner.

### Plan Preparation

In recognition of its historical and ongoing commitment to sustainability, the Jetport received a grant through the Federal Aviation Administration's Sustainable Master Plan Pilot Program to support the Sustainable Airport Master Plan (SAMP). With its first official sustainable master plan, the Jetport is taking the next step toward full sustainability integration and is recognizing the potential to improve its overall operating efficiency in a fiscally, environmentally, and socially responsible manner.

The sustainable airport master planning process integrates sustainability planning elements into the traditional airport master planning process. Combined, the sustainability and master planning processes provide the flexibility necessary to consider the Jetport’s operational and financial constraints with the purpose of this unified approach to:

- Ensure goals and objectives developed as part of the sustainability planning process were used to drive the recommendations of the master plan; and
- Ensure standalone sustainability strategies are not at odds with the recommendations of the master planning process.

### Sustainability Planning

The Jetport Consultant Team worked with Jetport staff and stakeholders to prioritize six sustainability focus areas. These priority categories are areas of primary importance to the Jetport and its stakeholders, as well as possessing the greatest potential for sustainability performance improvement.

The Sustainability Baseline Assessment evaluated the Jetport's performance related to these categories, which include:

- Greenhouse Gas Emissions
- Energy
- Waste Management and Recycling
- Ground Access and Transportation
- Social Responsibility; and
- Governance.

The Jetport SAMP is of interest to local citizens, community organizations, airport users, airport tenants, area-wide planning agencies, and aviation organizations. The City identified a group of community members and aviation interest groups to serve on the Planning Advisory Committee (PAC) and act in an advisory role in the preparation of the SAMP. The PAC met five times over the course of the study. In addition, the Jetport hosted four public information workshops to provide information and solicit input from any other interested citizens.

### Demand-Based Planning

Facility planning begins with a definition of demand that may reasonably be expected in the future. For the Jetport, this involved updating forecasts to identify future aviation demand. Recognizing the realities of year-to-year fluctuations in activity, the Master Plan should be keyed more to potential demand levels than future dates in time. These planning horizons were established as levels of activity that will call for consideration of the next step in the Master Plan program. This will allow the City to adapt to unforeseen increases or declines in certain types of activity.

### Forecast Summary

The Jetport considered its unique operating conditions, as the Sustainability Baseline Assessment identified, along with the environmental priorities of the City of Portland, State of Maine, and the greater airport industry, in the development of sustainability goals and objectives. These elements of the Jetport’s sustainability framework, reflect stakeholder input, and will guide the organization’s day-to-day operations and decision-making.

### Non-Stop Destinations
Recommendations from the 2008 Master Plan led to the improvements that have occurred at the Jetport over the last several years. Among the major improvements were Runway 18-36 safety area upgrades, the east extended runway safety area on Runway 11-29, and the terminal building, apron, and parking garage expansion. In addition, the south general aviation apron and access road were developed, setting the stage for a second fixed base operator. (The centerfold exhibit shows development stages for current recommendations.)

The updated plan carries forward many recommendations and proposes others to meet changing industry and safety requirements. The evaluation of the recommendations included several criteria, including the Jetport’s sustainability goals and objectives.

Airfield - Based on existing and projected uses, both runways are adequately sized to meet existing and long term demand. The pavement strength of the primary runway, however, may need to be increased in the future to accommodate some of the newer aircraft in the passenger airline and air cargo fleet. Several airfield taxiway projects have been identified to satisfy FAA airfield geometrical standards. These include: reconfigure the eastern portion of Taxiway A; realign Taxiway C to be fully parallel to Runway 18-36; construct a partial parallel taxiway on the east side of Runway 18-36 to link the cargo apron with Taxiway A; construct a new connector taxiway linking Taxiway B to Runway 36; develop an aircraft run-up apron in the southeast quadrant; and close the Runway 11 hold apron and replace with a by-pass taxiway and an enlarged long term holding/deciding apron near the terminal.

Passenger Terminal - The recent terminal project turned development of the terminal to the northwest. The recommended plan allows for three more gates to the terminal. The plan also can support an easterly extension of the second level concourse to replace the Gate 1 boarding bridge structure. These improvements would be driven by demand and only pursued as passenger enplanements and flights reach and exceed the projected long term levels. Other terminal building modifications proposed include: adding bag claim facilities to the west to meet existing and long term needs; reconfiguring gate alignments to allow for the increased wingspans, especially for increasing use of fuel-savings winglets on the airline fleet - no internal building changes would be required; and developing a U.S. Customs and Border Protection facility for secure scheduled non-stop international arrivals at PWM. The plan would also allow for international air service out of gate areas 4 and/or 5 and secured arrival passage to facilities on the main floor beneath the gate areas.

Air Cargo - The recommended plan for air cargo is just slightly updated from the previous Master Plan. The plan still includes additional apron with adjacent space for cargo buildings, allowing for two large structures. While this plan is intended now for air cargo, ultimately it could serve the same purposes for general aviation. If the plan is followed, the existing air cargo building utilized by FedEx could be repurposed for airport maintenance.

General Aviation - The bulk of the Jetport’s general aviation facilities are currently located on the north general aviation ramp. The previous Master Plan recommended adding facilities on the south side of the airport. The City has since approved a leasehold development for general aviation facility development to the south of Runway 11-29. Some additional general aviation needs can also be accommodated on the north ramp. These areas should be more than adequate to accommodate projected general aviation aircraft and associated facility needs.

Automobile Parking Garage - The existing public parking garage includes the lower level floor for rental car ready-return. As parking needs grow, the garage can be extended northwest. This will also better serve rental car users by improving pedestrian access from rental return to the terminal ticketing and departure areas.

The capital improvement plan (CIP) covers the same years as the forecasts in the planning effort. The Short Term is programmed annually through the first six years of the plan. The remaining projects are grouped into Intermediate (years 7-11) and Long Term (years 12-20) planning horizons. By utilizing planning horizons instead of specific years for Intermediate and Long Term development, the Jetport will have greater flexibility to adjust capital needs as demand dictates.

The exhibit on the next page presents the staging of the master plan projects color-coded by Short Term, Intermediate, and Long Term planning horizons.

The CIP was reviewed from a sustainability perspective, identifying opportunities where sustainability practices could improve the economic, environmental, and social performance of included projects. As these projects move forward, the Jetport will consider the identified sustainability enhancements for potential inclusion into project specifications. Some of these enhancements include pervious and permeable pavements to improve stormwater management; incorporating resiliency measures to protect the Jetport’s investments and minimize future operational disruptions; incorporating material reuse and recyclables in infrastructure construction; and designing for deconstruction. (The centerfold includes the CIP projects and denotes those projects where potential sustainability enhancements were identified.)

The Jetport will also consider sustainable alternatives and life cycle costing in future CIP projects and other Jetport purchasing.

A detailed financial evaluation was also completed. The table below presents the recommended CIP and its corresponding cost estimates in 2016 dollars, inflated at 2.7 percent annually and also includes contingencies, design costs, and construction management costs. As shown in the table, the CIP is estimated at approximately $193.3 million in 2016 dollars and approximately $271.8 million in inflated dollars.

The master plan’s financial analysis factored all proposed capital and operation/maintenance costs against proposed incomes. The result indicated that the Jetport is fully capable of generating sufficient revenues to offset future expenditures without the need for financial assistance from City of Portland taxing resources. The airport is currently and projected to remain financially self-sufficient.

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SUSTAINABILITY PROGRAM
The following provides an overview of the Jetport’s sustainability program, including its six priority categories (with examples of related past actions), goals, and select actions for potential implementation. Also included on the next page are past actions and selected actions for the future with regard to water quality and noise.

GREENHOUSE GAS EMISSIONS
Sustainability Goal: Become a national airport leader in climate change mitigation by supporting the reduction of greenhouse gas emissions generated from Jetport controlled and influenced sources.

At airports, greenhouse gas emissions typically derive from the combustion of fossil fuels related to the operation of aircraft, vehicles used for transporting passengers, ground support equipment, airport maintenance and operations vehicles, and through energy consumption, such as natural gas and electricity. Greenhouse gases have been linked to changes in the Earth’s climate, and their reduction would mitigate related effects.

Example Baseline Action: The Jetport incorporated 400-hertz ground power at passenger boarding bridges, which reduced the use of on-board auxiliary power units and diesel-powered portable ground units.

Select Sustainability Actions for Potential Implementation:
• Provide pre-conditioned air at all commercial service aircraft gates
• Install public charging stations in the garage to accommodate electric vehicles

ENERGY
Sustainability Goal: Become a national airport leader in energy conservation, while considering opportunities for on-site renewable energy generation.

Energy conservation initiatives at airports directly result in energy savings. The generation and/or procurement of renewable energy minimizes an airport’s dependence on fossil fuels. Both tactics could reduce the Jetport’s utility costs, provide for long-term stability in those costs, and reduce associated greenhouse gas emissions.

Example Baseline Actions:
The Jetport installed a geothermal heating and cooling system, which provides a source of renewable energy, and constructed an energy-efficient terminal expansion that achieved LEED® Gold certification.

Select Sustainability Actions for Potential Implementation:
• Continue to upgrade lighting within the parking garage to LEDs
• Install a pilot-controlled airfield lighting system

WASTE MANAGEMENT AND RECYCLING
Sustainability Goal: Augment the Jetport’s existing waste management practices to reduce waste generation and land disposal, and continuously improve its exemplary deicing recovery and recycling program.

Airports generate varying types and amounts of waste that primarily include municipal solid waste (MSW), construction and demolition debris, compostable waste, and depleted waste. Minimizing waste and increasing diversion activities (recycling, composting) at the Jetport could reduce related costs and minimize associated environmental impacts.

Example Baseline Actions:
The Jetport installed a geothermal heating and cooling system, which provides a source of renewable energy, and constructed an energy-efficient terminal expansion that achieved LEED® Gold certification.

Select Sustainability Actions for Potential Implementation:
• Design and implement a recycling awareness campaign for employees and passengers
• Make permanent the existing composting pilot program, and expand it beyond the Jetport’s back-of-the-house food preparation to include the passenger/public organic waste stream

GROUND ACCESS AND TRANSPORTATION
Sustainability Goal: Enhance the efficiency of regional and local access to and from the Jetport with an emphasis on high-occupancy modes of transportation and parking infrastructure that meets the needs of the Jetport’s users.

Typically, modes of surface transportation at an airport include private passenger vehicles, rental vehicles, livery, public transit, and pedestrian or cycling access. The Jetport’s passengers and employees appreciate efficient means of access, and such efficiencies have a direct benefit in reducing associated greenhouse gas emissions and improving local air quality.

Example Baseline Actions:
The Jetport installed covered bike parking racks and shower/ changing facilities to encourage employees to bike to work.

Select Sustainability Actions for Potential Implementation:
• Increase local collaborations by participating in local and regional partnerships and working groups
• Create indoor landscaped areas that celebrate and display flora of Maine

SOCIAL RESPONSIBILITY
Sustainability Goal: Promote the well-being of the Jetport’s employees and customers, while reflecting and supporting the social, economic, and cultural assets of the local community and greater region.

An airport’s operations have a direct effect on its surrounding communities, as well as its other stakeholders, such as its employees and passengers. Topics associated with an airport’s social responsibility include employee engagement and well-being, passenger experience, and community outreach and support.

Example Baseline Actions:
The Jetport’s Above and Beyond program encourages exceptional customer service among its staff and business partners.

Select Sustainability Actions for Potential Implementation:
• Include a requirement on all capital improvement applications to identify a proposed project’s sustainability elements and any known alternatives that serve the same purpose with greater efficiency and/or environmental and social performance
• Incorporate sustainability guidelines into future tenant and vendor contracts, and provide training on these guidelines, as needed

GOVERNANCE
Sustainability Goal: Integrate sustainability throughout the Jetport’s organizational framework.

Governance is comprised of the systems in place that enable an organization to make and implement decisions. They may be formal (e.g., related to regulations) or informal (e.g., established by organizational culture), and are profoundly influenced by the organization’s leadership.

Example Baseline Action: The Jetport incorporated sustainability principles in its mission statement, which communicates its purpose.

Select Sustainability Actions for Potential Implementation:
• Include a requirement on all capital improvement applications to identify a proposed project’s sustainability elements and any known alternatives that serve the same purpose with greater efficiency and/or environmental and social performance
• Incorporate sustainability guidelines into future tenant and vendor contracts, and provide training on these guidelines, as needed
The Jetport is the primary aviation gateway for the State of Maine, welcoming commerce and visitors, while providing residents with access for outward travel to national and intercontinental destinations. The Jetport creates significant benefits that extend beyond the aviation community to impact economic growth and development, as well as the quality of life of Maine residents. Airline travelers from across the nation and around the globe come to Maine to conduct business, meet with clients and suppliers, and place orders for goods and services produced in the state. Even greater numbers come for personal reasons, to visit friends and relatives, or to hike, fish, hunt, or simply vacation in the midst of world class scenery and recreation opportunities.

ECONOMIC BENEFIT STUDY PROCESS

On-Airport
Aviation related and non-aviation related businesses and agencies on the Jetport generate sales and revenues, hire workers, and pay employees.

Off-Airport
Air visitor spending, including lodging, restaurants, car rental, retail items, and entertainment.

Jetport’s Economic Benefit

The Jetport is the primary aviation gateway for the State of Maine, welcoming commerce and visitors, while providing residents with access for outward travel to national and intercontinental destinations. The Jetport creates significant benefits that extend beyond the aviation community to impact economic growth and development, as well as the quality of life of Maine residents. Airline travelers from across the nation and around the globe come to Maine to conduct business, meet with clients and suppliers, and place orders for goods and services produced in the state. Even greater numbers come for personal reasons, to visit friends and relatives, or to hike, fish, hunt, or simply vacation in the midst of world class scenery and recreation opportunities.

Although qualitative advantages created by an airport are important, they are also challenging to measure. In studying the economic benefits of airports and aviation, regional analysts have emphasized economic benefits that can be quantified:

- Employment: the number of jobs supported by economic activity created by the presence of the Jetport. Employment is the number of jobs supported by economic activity created by the presence of the Jetport.
- Payroll: includes income to workers as employee compensation (the dollar value of payments received by workers as wages and benefits) and business owners income.
- Output: is the value of the production of private firms and public agencies.

This process is illustrated in the graphic to the right.

Summary of Economic Benefits

<table>
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<tr>
<th>Source</th>
<th>Employment</th>
<th>Payroll</th>
<th>Output</th>
</tr>
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<tbody>
<tr>
<td>Direct Economic Benefits</td>
<td>8,261</td>
<td>$269,6 million</td>
<td>$1,0 billion</td>
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</table>

The total annual economic benefits of the Portland International Jetport include 8,261 jobs with payroll of $269.6 million and output of $1.0 billion, incorporating all multiplier or secondary economic benefits. The secondary and total economic benefits flowing from the initial direct benefits of on-airport commercial service and general aviation activity are detailed in the table to the left.

In addition to the six priority goals on the previous page, the Sustainability Baseline Assessment also made recommendations related to Water Quality and Noise. The Jetport already mitigates impacts in these areas where practicable, so these recommendations emphasize maintaining and expanding ongoing efforts.

Water Quality

Like many airports, the Jetport is located near bodies of water; it borders the Fore River on the east and Long Creek on the south. With this proximity, and the expanse of impervious surfaces on an airport, the Jetport’s activities have the potential to cause water quality impacts to these watersways. Sources of potential water quality contamination from airports primarily derive from stormwater runoff associated with anti-icing/deicing and construction activities.

Example Baseline Actions: The Jetport has an award-winning aircraft deicing fluid recycling facility, operated by Inland Technologies, that captures and recycles approximately 75 percent of deicing fluid (about as high as currently possible). This protects nearby water quality by limiting the amount of propylene glycol in Jetport stormwater. In addition, the Jetport employs water quality filters and a large water quality pond to further mitigate potential impacts.

Select Sustainability Actions for Potential Implementation:

- Where appropriate, install additional on-site stormwater management options, particularly “green” infrastructure projects that naturally control and/or treat stormwater, such as bioswales, rain gardens, and permeable pavements.
- Harvest rainwater to reduce the Jetport’s stormwater volume. This would also reduce the Jetport’s water consumption, if applied to non-potable uses, such as landscaping (i.e., irrigation).
- Example Baseline Actions: The Jetport has an award-winning aircraft deicing fluid recycling facility, operated by Inland Technologies, that captures and recycles approximately 75 percent of deicing fluid (about as high as currently possible). This protects nearby water quality by limiting the amount of propylene glycol in Jetport stormwater. In addition, the Jetport employs water quality filters and a large water quality pond to further mitigate potential impacts.

Noise

Noise at airports primarily derives from aircraft operations, but may also come from other airport activities, such as construction. Noise has a big influence on an airport’s relationship with its surrounding communities, particularly if those communities are densely populated. The Jetport is located within a relatively urban area, including an historic residential district, and recognizes its responsibility to mitigate airport-related noise to the greatest extent practicable. The Jetport, however, does not control aircraft operations, and like other airports, it works with the FAA, often in concert with local jurisdictions, to limit the effects of noise from these sources.

Example Baseline Actions: Through the FAA’s CFR Part 150 Noise Compatibility Planning program, the Jetport has established and implemented a Noise Abatement Program that includes the voluntary Fly Quiet Program, which encourages aircraft operators to use specific flight patterns and procedures that reduce aircraft noise in nearby communities. The Jetport also supports a Noise Advisory Committee that provides an official forum for the discussion of airport noise and related issues between the Jetport and members of its surrounding communities.

Select Sustainability Actions for Potential Implementation:

- Identify noise-generating mechanical systems and relocate them away from residential areas, where feasible, consider residential communities in the positioning of new on-site noise generating mechanical equipment.
- Require all construction contractors working on the Jetport to mitigate unwanted noise and vibration to the greatest extent practicable.
- Along with the Noise Advisory Committee continue to monitor aircraft operations and flight mix as well as effectiveness of the currently approved noise abatement procedures. When deemed necessary, apply to the FAA to update the CFR Part 150 Noise Exposure Maps (NEM), then if needed, the Noise Compatibility Plan (NCP).

"The Jetport has an award-winning aircraft deicing fluid recycling facility..."