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# 1. Introduction

## INTRODUCTION

Phase II of the Maine State Aviation System Plan (SASP) is the culmination of a two-part comprehensive strategic update to the SASP, intended to provide a strategic pathway to guide public investment and system direction in advancing aviation access, reliability, and capabilities across the State for the next two decades and beyond.

Reflecting MaineDOT's mission:

**To support economic opportunity and quality of life by responsibly providing our customers the safest and most reliable transportation system possible, given available resources.**

The purpose of the SASP is to provide guidance for the State's Aviation System on carrying out MaineDOT's mission. Phase II meets that requirement by using the information gathered and analyzed in Phase I - including the summary of findings, action items, and priority recommendations - and transforms these into actionable directions to meet the overall mission goals. In Phase II, in-depth analyses were conducted to provide tangible and actionable recommendations to MaineDOT, airport sponsors, and other system stakeholders on ways to address fiscal challenges and achieve the key goals identified in Phase I.

These included creating a database for tracking airport projects and their source of funding, developing a model that uses airport performance metrics and project priority ranking to determine the most fiscally efficient use of public funding for infrastructure projects, and an economic review of the fiscal impact of each State airport in the National Plan of Integrated Airport Systems (NPIAS).

### 1.1 MAINE DOT LONG-RANGE TRANSPORTATION PLAN

The MaineDOT Long-Range Transportation Plan (LRTP) is a comprehensive vision for the State's transportation system, outlining a strategic framework for implementation strategies for MaineDOT and its partners. The LRTP provides guidance to achieve that vision over the next two decades. The key goals from the LRTP (listed below) serve as strategic cornerstones and are integrated into the process and initiatives throughout our State Aviation System Plan:

- **Safe Travel:** Provide a safe transportation system for all users and modes of transportation
- **A Well Managed System:** Effectively manage Maine’s existing transportation system within reliable funding levels to provide levels of service that are acceptable to our customers.
- **A Vibrant Economy and World-Class Quality of Life:** Invest in transportation initiatives that support economic opportunity for Maine people, communities, and businesses.
- **Environmentally Sustainable Transportation System:** Invest in practical transportation solutions that mitigate impacts on the natural world and prepare for the realities of change.
- **Equitable Access:** Ensure that all Maine people have access to safe and reliable transportation regardless of who they are or where they are.

Each one of these goals are incorporated throughout this aviation system plan, whether it’s through the evaluation of performance metrics to assist in right-sizing airport facilities, or encouraging public-private initiatives that maintain a well-managed, supportable airport system well into the future. Providing a safe, reliable, and well-maintained air travel system that provides equitable access for all of Maine’s population encourages the growth of a vibrant economy. Additionally, advances in emerging technologies in the aerospace industry offer opportunities for workforce development, the incorporation of environmentally sustainable energy sources, and the opening up of air travel and its benefits to a much wider section of the Maine’ population.

## 1.2 MAINE STATE AVIATION SYSTEM PLAN GOALS

The six (6) key goals outlined in Phase I of the Maine SASP outline how the State’s Aviation System will follow the tenants given in the Long-Range Transportation Plan. The goals serve as fundamental guidelines to be referenced and followed for the next two decades. The key goals established by MaineDOT and the SASP Project Advisory Committee are as follows:

1. **Identify Public Value that Justifies Investment:** Understand current and future potential aviation system contributions to meeting expressed societal needs.
2. **Nurture Key System Components:** Identify trends, gaps, opportunities, and prioritized recommendations for nurturing key system components, including aviation workforce development.
3. **Right-Size Facilities:** Use realistic, fiscally constrained life-cycle analyses to foster the development of right-sized facilities affordable for sponsors and investment partners.
4. **Leverage Private Investment:** Recommend strategies to leverage public investments to generate private investments and public policies that support a safe and efficient airport system.

5. **Develop Metrics:** Develop meaningful and practical metrics to track the condition, utilization, and performance of the airport system.
6. **System Management:** Identify and justify necessary and desirable system management functions, including who should perform them and how they should be financed.

### 1.3 REVIEW OF PHASE I – MAINE STATE AVIATION SYSTEM PLAN METHODOLOGY

Phase I of the Maine SASP was completed in 2021 and concluded with a summary of recommendations to bring forward with Phase II. Phase I efforts included the following:

- Stakeholder Outreach
- Summary of Existing State Aviation System
- Aviation Activity Forecast
- System Capabilities and Performance Gaps
- Findings, Priorities, and Action Items

The Phase I in-depth analysis considered a fully comprehensive and direct system perspective from the stakeholder groups that was inclusive of more than 300 system users. These users included pilots, airport managers, local, state, and federal officials, and members of the public to help guide the development of the broader system plan. These efforts took shape through various forms of outreach including:

- On-site Project Advisory Committee (PAC) and Maine Aeronautical Advisory Board (MAAB) meetings
- Airport Manager Survey completed by all managers within the 35 NPIAS airports in Maine.
- Additional outreach:
  - Privately-owned public-use airports
  - Regional planning, tourism, and economic development organizations
  - Native American tribes and state agencies
  - Focus groups from Washington County and outdoor recreation groups

Phase I included a thorough inventory of the State system infrastructure. A forecast was developed in alignment with direct activity levels with recognition of the regional identities and nuances of each airport. A comprehensive understanding of each airport within the context of their role and functions in serving their communities and contributing to the economic impacts shaped a foundation for identifying a compelling public value.

Phase I also identified key similarities based on regional nuances and divided the system into five (5) regions across the State (Northern, Western Mountains, Southern Central, Coastal, and Washington County). Each region was then assessed and summarized based on several factors:

- Challenging weather conditions
- Level of activity
- Most demanding users
- Facilities and services
- Functions available to support

The output of these findings served as the foundation to define priorities, identify responsibilities, and outline action items. Phase II recommends the regional boundaries identified in Phase I be revised to align with previously established MaineDOT regions. Taking advantage of the existing MaineDOT regional structure promotes improved use of capital resources and funding while reducing administrative requirements.

**PHASE I – SUMMARY OF FINDINGS**

The summary of findings of Phase I was broken out into seven (7) different categories:

- Facilities and services challenges
- Funding challenges
- Activity level and forecast outlook
- Sponsor challenges and local challenges
- Maintenance issues and needs
- Education and promotion
- Special condition use and nuances

Subsequently, the statewide significance was determined, along with the role of MaineDOT, the timing and priority of these efforts, and the results of their advancement into Phase II. Please refer to Phase I narrative for a comprehensive breakdown of the findings.

**Table 1-1** is a listing of Phase I findings incorporating the six (6) goals into the tasks that were performed during Phase II.

**Table 1-1 Phase I Findings Incorporated into Phase II**

Phase I Finding	Advanced to Phase II
<b>Facilities &amp; Services Challenges</b>	Chapter 2 – State-Wide Costs Chapter 4 – Performance Metrics Chapter 6 – Pathway to 2045
<b>Funding Challenges</b>	Chapter 2 – State-Wide Costs Chapter 4 – State Priority Guidance for Competitive Projects Chapter 6 – Pathway to 2045
<b>Activity Levels &amp; Forecast Outlook</b>	<i>N/A – Phase I Findings Sufficient</i>



Phase I Finding	Advanced to Phase II
<b>Sponsor Challenges &amp; Local Issues</b>	<i>N/A – Phase I Findings Sufficient</i>
<b>Maintenance Issues &amp; Needs</b>	Chapter 2 – State-Wide Costs Chapter 4 – Performance Metrics Chapter 6 – Pathway to 2045
<b>Education &amp; Promotion</b>	Chapter 3 - Maine SASP Economic Impact Analysis and Case Studies
<b>Special Condition/Use Nuances</b>	Chapter 2 – State-Wide Costs Chapter 3 - Maine SASP Economic Impact Analysis and Case Studies Chapter 4 – State Priority Guidance for Competitive Projects Chapter 6 – Pathway to 2045

**1.4 PHASE II – SUMMARY OF GOALS AND OBJECTIVES**

Phase II primary objectives are to take the goals and recommendations outlined in Phase I and elevate them into system-wide strategies and recommendations for MaineDOT.

Phase II focused on developing overarching objectives for implementation across the system. It also aimed at converting plan recommendations into actionable recommendations and deliverables that can be used as resources.

This report provides summaries of tasks that were performed in Phase II with final recommendations of state-wide strategies and objectives.

- Chapter 2 - State-Wide Costs** – This chapter explores the financial challenges faced across the System. It examines system-wide project costs for AIP-eligible and AIP-ineligible projects, evaluates economic factors impacting local sponsors and their communities, and assesses the limitations of current funding gaps with system plan recommendations for alternative funding opportunities.
- Chapter 3 – Maine SASP Economic Impact Analysis and Case Studies** – This section provides a summary overview of the *2022 Maine State Aviation System Plan Economic Impact Analysis and Case Studies* spotlighting the economic impact of the unique economic contributions of the Aviation System to the State of Maine.
- Chapter 4 – Performance Metrics and Standards** – This section provides a summary assessment and system plan recommendations of sponsor performance metrics and minimum facility and service requirements metrics.

- **Chapter 5 – State Priority Guidance for Competitive Projects** – This section provides a summary overview of the methodology, scoring criteria and results of the State Priority Ranking Model, highlighting its adaptive use as guidance tool to help airports in enhancing the competitiveness of their projects.
- **Chapter 6 – Pathway to 2045** – This section provides a summary overview and a strategic pathway forward of state-wide objectives addressing challenges identified in the SASP Phase I and Phase II.

## 2. State-Wide Costs

### INTRODUCTION

During the Phase I process, it was determined that addressing funding challenges was a top priority of the State Aviation System Plan (SASP).

Included in this chapter is a summary of the following tasks analyses:

- Magnitude of Costs for Identified Airport Infrastructures Across the Maine SASP
- Facilities Assessment and Funding for Crosswind Runways and Taxiway Widths
- Low-Competing/High-Cost Projects
- Financial Stability of Maine SASP and its Surrounding Communities
- Purchasing Power
- State Block Grant Program
- Alternative Funding Opportunities
- Alternative Funding Opportunities: System-Wide Cost Eligibility

See **Appendix A** for a full version of the memorandums (memos) referenced in Chapter 2.

### 2.1 MAGNITUDE OF COSTS

The *Magnitude of Costs* memo (pg. A-1 – A-7) outlines guidelines and methodologies for projecting costs associated with various airport infrastructure components. The methodology accounts for the unique regional characteristics that influence pricing. The format and approach enable the State of Maine to fiscally plan accordingly based on historical Federal Aviation Administration (FAA) Airport Improvement Program (AIP) grants. **Table 2-1** is a summary of the magnitude of costs by project type across the System:

**Table 2-1 Summary of Anticipated Costs of New or Reconstruction Projects at Airports\***

Project Type	Cost	Recommended Value	Per Unit
Runways, Taxiways, Aprons	\$15 - \$30	\$22	Square Foot
Fuel Farm	\$40 - \$75	\$57	Gallon
Snow Removal Equipment (SRE)	\$750,000 - \$950,000	-	Each
Aircraft Rescue and Firefighting (ARFF) Equipment	\$850,000 - \$1,000,000	-	Each
T-Hangars	-	\$165	Square Foot
Box Hangars, SRE Buildings, ARFF Buildings	\$284 - \$300	\$300	Square Foot
Terminal Buildings	\$700 - \$900	-	Square Foot

Source: McFarland Johnson Inc, analysis, 2022.

\* Table values in 2022 dollars

In the analysis, projects were divided into their respective groups based on grant history covering the period from 2016 to 2022. If a project was not present in this timeframe, the grant history was expanded to as early as 2013. The projects were analyzed on a per square foot basis when appropriate. For fuel farms, a cost analysis was based upon a sample sized 8,000-gallon tank and for SRE and ARFF equipment the analysis was based solely on historical purchasing costs. For per square foot analysis, approximate dimensions were obtained from the grant project description, published FAA data, or Google mapping. Project costs were then escalated to present dollar value (2022) based upon the U.S. Bureau of Labor Statistics.

It was determined that applying the magnitude of cost results was most appropriate for high-level planning efforts such as early Airport Capital Improvement Program (ACIP) programming and master planning efforts. In application, MaineDOT encourages airports to update the methodology to reflect the current-year values from the U.S. Bureau of Labor Statistics inflation calculator and consider geographical nuances relevant to their particular airport.

## 2.2 FACILITIES ASSESSMENT AND FUNDING FOR CROSSWIND RUNWAYS AND TAXIWAYS

Understanding the FAA guidelines for AIP eligible runways and taxiways is crucial in determining the right-size investment in airport infrastructure across the State of Maine. An assessment of crosswind runways and taxiway widths was conducted. A financial cost analysis was performed and with an assessment of alternative uses of infrastructure elements, a reduction in pavement size, and a change in pavement type was explored while keeping in consideration the safety of the airfield. Recommendations were made with regard to the airport's service role in the National Plan of Integrated Airport System (NPIAS); critical functions including community access and emergency preparedness and response; alongside promoting economic growth to help lead MaineDOT in the direction of the right-sized investment.

### 2.2.1 STATE-WIDE CROSSWIND RUNWAY ELIGIBILITY AND COSTS

The FAA provides funding for airports with eligible crosswind runways as defined in AC 150/5300-13B, if a crosswind runway does not meet the eligibility requirements, the cost of maintenance of the existing runway then falls to the airport sponsor and the State. In the *State-Wide Crosswind Runway Eligibility and Costs* memo (pg. A-8 – A-29) McFarland Johnson analyzed 15 airports that currently have crosswind runways. An assessment of the necessity of the crosswind runways was made in the context of wind coverage in relation to the primary runway; regular use of critical aircraft requiring crosswind coverage; and allowable crosswind components. **Table 2-2** lists nine (9) airports that would not meet the minimum FAA funding eligibility requirements for a crosswind runway. For AIP eligibility, the FAA requires wind coverage from the primary runway to be less than 95 percent and the number of annual operations to be greater than 500.

**Table 2-2: FAA AIP - Ineligible Crosswind Runways**

Airport	Wind Coverage	Operations	Comments
Augusta State (AUG)	96.82%	581 ops	Not likely justifiable
Caribou Municipal (CAR)	95.07%	295 ops	No specific GARD data
Central Maine Regional (OWK)	95.77%	414 ops	No specific wind or GARD data
Dexter Regional (1B0)	95.34%	338 ops	(Turf) no specific wind or GARD data
Greenville Municipal (3B1)	90.22%	498 ops	No specific wind or GARD data
Hancock Country-Bar Harbor (BHB)	96.96%	471 ops	Not likely justifiable
Houlton International (HUL)	93.96%	106 ops	No specific GARD data
Millinocket Municipal (MLT)	97.08%	65 ops	Not likely justifiable
Waterville-Robert Lafleur (WVL)	95.02%	481 ops	May be justifiable

Source: McFarland Johnson, Inc, analysis, 2024.

An analysis was then performed on the cost of maintaining the current pavement size for AIP- ineligible crosswind runways in juxtaposition with a reduction of the runway pavement to minimum requirements and the transition to a more cost-effective turf runway. The cost analysis for **Table 2-3** includes the initial cost of either pavement reconstruction for the current pavement size, reduction to minimum size, and transition to turf, plus the maintenance costs to ensure the pavement lasts the recommended 20-year lifecycle.

While DeWitt Field/Old Town (OLD) technically fulfills the FAA AIP-eligibility criteria, for the life cycle cost analysis, the airport was determined to be included. This is due to the incomplete data available regarding both the absence of weather reporting stations and incomplete GARD data to measure operations.

**Table 2-3: Summary Cost Analysis for Pavement Replacement, Reduction, and Transition to Turf – 20-Year Life Cycle Analysis**

Airport	Crosswind Runway	Total Runway (SF)	Minimum Runway (SF)	20-Year Life Cycle Current Pavement Replacement Cost	20-Year Life Cycle Minimum Runway Cost	20-Year Life Cycle Runway to Turf Costs
Augusta State (AUG)	RWY 08-26	195,975	180,000	\$2,806,362	\$2,577,600	\$932,841
Caribou Municipal (CAR)	RWY 11-29	226,275	192,000	\$3,240,258	\$2,749,440	\$1,077,069

Airport	Crosswind Runway	Total Runway (SF)	Minimum Runway (SF)	20-Year Life Cycle Current Pavement Replacement Cost	20-Year Life Cycle Minimum Runway Cost	20-Year Life Cycle Runway to Turf Costs
Central Maine Regional (OWK)	RWY 13-21	319,840	180,000	\$4,580,109	\$2,577,600	\$1,522,438
Dewitt Field-Old Town Municipal Airport (OLD)	RWY 04-22	210,150	180,000	\$3,009,348	\$2,577,600	\$1,000,314
Dexter Regional (1B0) *	RWY 07-25	149,880	-	-	-	-
Greenville Municipal Airport (3B1)	RWY 03-21	225,075	204,000	\$3,223,074	\$2,921,280	\$1,071,357
Hancock County-Bar Harbor (BHB)	RWY 17-35	252,225	180,000	\$3,611,862	\$2,577,600	\$1,200,591
Houlton International Airport (HUL)**	RWY 01-19	162,000	162,000	\$2,319,840	\$2,319,840	\$771,120
Millinocket Municipal Airport (MLT)	RWY 16-34	400,000	180,000	\$5,728,000	\$2,577,600	\$1,904,000
Waterville Airport (WVL)**	RWY 14-32	138,060	138,060	\$1,977,019	\$1,977,019	\$657,166
<b>Total</b>				<b>\$30,495,872</b>	<b>\$22,855,579</b>	<b>\$10,136,896</b>

Source: McFarland Johnson, Inc analysis, 2024.

\*The airport currently has a turf runway therefore it is not included in the analysis

\*\*Existing runway dimensions are smaller than the recommended minimum runway requirements recommended in the high-level runway length analysis, the current pavement size is utilized in the calculations.

Notes: (1) Minimum runway cost refers to reducing the runway size to a minimum A-I/B-I runway requirement.

(2) The turf costs are related to transitioning an asphalt runway to a turf runway that is less costly per sq ft. A turf runway helps the airport maintain the ability of A-I/B-I aircraft to access the airfield when the primary runway doesn't provide crosswind coverage. (3) Costs reflect 2022-dollar values.

A list of summary recommendations for the 15 airports analyzed that currently have crosswind runways can be found in **Table 2-4** below.

**Table 2-4: Summary of Recommendations for Crosswind Runway Airports**

Airport	MJ Recommendations
Auburn/Lewiston Municipal (LEW)	Eligible to maintain asphalt crosswinds runway
Augusta State (AUG)	Not eligible, may benefit from the redevelopment of the runway or seek alternative funding sources for ineligible pavement
Biddeford Municipal (B19)	Does not support the new development of a crosswind runway or seek alternative funding sources for ineligible pavement
Caribou Municipal (CAR)	Eligible to maintain asphalt crosswinds runway, but reevaluate its use after it reaches its maximum useful life
Central Maine /Norridgewock (OWK)	Not eligible to maintain asphalt crosswinds runway, recommend reevaluating its use after it reaches its maximum useful life
Dewitt Field/Old Town Municipal (OLD)	Eligible to maintain asphalt crosswind runway, potential to fall into ineligibility
Dexter Regional (1B0)	Currently uses turf crosswind runway
Greenville Municipal (3B1)	Not eligible, support for minimum transition to turf runways or seek alternative funding for ineligible pavement
Hancock County/Bar Harbor (BHB)	Not eligible, may benefit from redevelopment of the runway for non-aeronautical revenue generation or seek alternative funding for ineligible pavement
Houlton International (HUL)	Not eligible to maintain asphalt crosswinds runway, but reevaluate its use after it reaches its maximum useful life
Knox County Regional (RKD)	Eligible to maintain asphalt crosswinds runway
Millinocket Municipal (MLT)	Not eligible, support for minimum transition to turf runways or seek alternative funding for ineligible pavement
Portland International Jetport (PWM)	Eligible to maintain asphalt crosswinds runway
Presque Isle International (PQI)	Eligible to maintain asphalt crosswinds runway
Sanford Seacoast Regional (SFM)	Eligible to maintain asphalt crosswinds runway
Waterville Robert Lafleur (WVL)	May be eligible to maintain asphalt crosswind runway

Source: McFarland Johnson, Inc analysis, 2024.

In effort to right-size the aviation system, if FAA deems these runways to be ineligible, MaineDOT does not support the crosswind runway in their current configuration. Further justification and a cost-benefit analysis would be required in order to support this infrastructure. MaineDOT will require, on the master planning level, a cost-benefit analysis of maintaining an ineligible crosswind runway in their existing condition, reduction to minimum runway requirements, and a transition to turf runways be analyzed. Additionally, it is at the master planning level that analysis into decommissioning a runway and alternative use be analyzed.

**2.2.2 STATE-WIDE TAXIWAY WIDTH ELIGIBILITY AND COSTS**

Several Maine airports have taxiways that exceed the width requirements of their Taxiway Design Group (TDG) as specified by the FAA. An analysis was performed in the *State-Wide Taxiway Width Eligibility and Cost* memo (pg. A-30 – A-57) to determine the extent to which it is recommended to allocate State funds for the maintenance of taxiways that surpass the FAA taxiway width requirements and as such, are not eligible for AIP funding to maintain at the current width. The analysis identified airports that need to be assessed on a master planning level and developed a 20-year life cycle cost analysis with the goal of right-sizing airports.

The analysis contrasts the FAA criteria with the substantial operational needs and balances the safety of the airfield of aircraft providing critical functions and economic impacts. **Figure 2-1** outlines the FAA taxiway design standards based on the TDG.

**Figure 2-1: FAA Design Standards Based on Taxiway Design Group (TDG)**

Item	TDG							
	1A	1B	2A	2B	3	4	5	6
Taxiway/Taxilane Width <sup>1</sup>	25 ft (7.6 m)	25 ft (7.6 m)	35 ft (10.7 m)	35 ft (10.7 m)	50 ft (15.2 m)	50 ft (15.2 m)	75 ft (22.9 m)	75 ft (22.9 m)
Taxiway Edge Safety Margin <sup>1</sup>	5 ft (1.5 m)	5 ft (1.5 m)	7.5 ft (2.3 m)	7.5 ft (2.3 m)	10 ft (3 m)	10 ft (3 m)	14 ft (4.3 m)	14 ft (4.3 m)
Taxiway Shoulder Width <sup>2</sup>	10 ft (3 m)	10 ft (3 m)	15 ft (4.6 m)	15 ft (4.6 m)	20 ft (6.1 m)	20 ft (6.1 m)	30 ft (9.1 m)	30 ft (9.1 m)
Taxiway/Taxilane Centerline to Parallel Taxiway/Taxilane Centerline w/180 Degree Turn	See <a href="#">Table 4-6</a> and <a href="#">Table 4-7</a> .							

**Note 1:** See [Figure 4-4](#).  
**Note 2:** When the most demanding aircraft has four engines and is TDG 6, the standard taxiway shoulder width is 40 feet (12.2 m).

Source: FAA AC 150 /5300-13B, 2024.

Below are the following recommendations to be considered for the study and its results. These recommendations seek to strike a balance between right-sized taxiway widths with the community needs the airport serves while encouraging access throughout the State.

1. Small Local and Basic airports that fall into the TDG of 1A or 1B and do not historically have enough operations under the FAA-defined regular use to qualify for 2A or 2B, cannot justify a larger than 25-foot taxiway width. It is recommended that through the master plan process, these airports designate at least one (1) route to the apron where larger aircraft than TDG allows for can remove themselves from the runway environment safely.
2. Airports that are categorized into the TDG of 2A or 2B, and historically fall into the regular use of aircraft within that category justify a 35-foot taxiway width. This is sufficient to handle a majority of the aircraft that utilize the airport. Depending upon the specifics of the



airport, the airport may be able to justify a route to the apron under the TDG category of 3 or a 50-foot taxiway width.

3. Regional airports that cannot justify a designated TDG 3, 2A, or 2B under FAA standards might see their taxiway widths reduced to 25 feet. This downgrade could jeopardize the crucial role these airports play in the System, as these airports act as reliever airports as well as provide functions of critical community access and emergency preparedness and response. A larger aircraft would be unable to utilize the runway with a reduced taxiway width and may need to use an alternate airport in the future. It is recommended that these airports designate at least one (1) route to an apron that is classified as a TDG 3, with a 50-foot taxiway width, enabling larger aircraft to remove themselves from the runway environment safely.
4. Commercial service airports should have at least one (1) route that qualifies for aircraft that are larger than their designated TDG (i.e. if they are a TDG 2A they should have at least one (1) route of taxiway width that meets TDG 3 standards). These airports are typically larger and should have the capacity to accept larger than regular-use aircraft and be able to remove themselves from the runway environment safely.

The analysis took into account the NPIAS roles, Aircraft Design Group (ADG) classifications, and TDG to outline airports whose current taxiway width is higher than FAA standards allow for. **Table 2-5** is an overall summary of airports with their designated NPIAS role, as well as the number of sections of the current taxiway that are constructed wider than FAA TDG standards. Bangor International Airport (BGR), Portland International Jetport (PWM), and Presque Isle International Airport (PQI) were not included in the analysis due to fulfilling the recommended requirements (above) of their NPIAS airport classification and having at least one (1) or more taxiways that are higher than their estimated lowest TDG (75 feet). In addition, Charles A. Chase Memorial Airport (44B) was not included due to the taxiway being turf and not asphalt.

**Table 2-5: Summary of All Airports Taxiway Widths Analysis**

ID	Airport Name	NPIAS Role	TDG	Width Requirement (ft)	Taxiway Sections Measured	Current Taxiway Sections Widths Wider than FAA TDG Specifications
LEW	Auburn/Lewiston Muni	Regional	2A	35	8	2
AUG	Augusta State	Regional	2A	35	12	12
BST	Belfast Muni	Local	1A	25	4	3
OB1	Bethel Regional	Local	2A	35	1	None
B19	Biddeford Muni	Local	1A	25	1	1
BXM	Brunswick Executive	Local	3*	50	3	3
CAR	Caribou Muni	Basic	2A	35	2	None

ID	Airport Name	NPIAS Role	TDG	Width Requirement (ft)	Taxiway Sections Measured	Current Taxiway Sections Widths Wider than FAA TDG Specifications
OWK	Central Maine Regional	Local	2A	35	5	1
OLD	Dewitt Field- Old Town Muni	Local	1B*	25	5	3
1B0	Dexter Regional	Local	1A	25	1	None
IZG	Eastern Slope Regional	Local	2A	35	3	3
EPM	Eastport Muni	Basic	1A*	25	2	1
3B1	Greenville Muni	Basic	1A*	25	5	3
BHB	Hancock County-Bar Harbor	Local	2A	35	9	2
HUL	Houlton Intl	Local	2A	35	9	8
57B	Islesboro	Unclassified	1A*	25	2	1
RKD	Knox County Regional	Commercial Service -Primary	2A	35	1	1
LRG	Lincoln Regional	Local	1A	25	1	1
MVM	Machias Valley	Basic	1A*	25	1	1
MLT	Millinocket Muni	Local	1A*	25	2	2
59B	Newton Field	Basic	2A	35	1	None
FVE	Northern Aroostook Regional	Basic	2A	35	5	2
81B	Oxford County Regional	Local	1A*	25	3	1
2B7	Pittsfield Muni	Local	2A	35	3	1
PNN	Princeton Muni	Basic	2A*	35	5	None
SFM	Sanford Seacoast Regional	Regional	3*	50	13	None
8B0	Steven A Bean Muni	Basic	1A*	25	3	3
93B	Stonington Muni	Unclassified	1A*	25	1	1
B21	Sugarloaf Regional	Basic	1A*	25	2	2
WVL	Waterville- Robert Lafleur	Local	2B	35	7	7
IWI	Wiscasset	Local	2A	35	5	4

Source: McFarland Johnson, Inc analysis, 2024.

\* Minimum Taxiway Design Group based on the width of the Taxiway or alternative measurements.

A 20-year life cycle analysis was completed with four (4) maintenance approach scenarios. **Table 2-6** is a comparison of the different maintenance approach methods and costs by 25 ft and 35 ft taxiway widths.

**Table 2-6: Maintenance Approach Comparison – 20-Year Lifecycle Cost Analysis**

Maintenance Approach	Maintenance Approach #1	Maintenance Approach #2	Maintenance Approach #3	Maintenance Approach #4
Methodology	This method utilizes crack sealing every two (2) years interluded with a surface seal at year 10 and crack repair at year 16	This method utilizes crack sealing every five (5) years interluded with a surface seal at year 10 and crack repair at year 15	This method utilizes crack sealing every five (5) years, a mill and overlay every 10 years	This method utilizes crack sealing every five (5) years, surface sealant every 7 years, and a mill and overlay at year 20.
Maintenance Cost 1st 20-Year Lifecycle (Year 0 - Year 20)	\$430,425 (25ft) \$602,595 (35 ft)	\$385,425 (25 ft) \$539,595 (35 ft)	\$355,500 (25 ft) \$497,700 (35 ft)	\$278,850 (25 ft) \$390,930 (35 ft)
1st 20-Year Lifecycle Cost Comparison Across All Maintenance Approaches	High Cost	Medium Cost	Medium – Low Cost	Low Cost
Maintenance Cost 2nd 20-Year Lifecycle (Year 21 - Year 40)	\$430,425 (25ft) \$602,595 (35 ft)	\$385,425 (25 ft) \$539,595 (35 ft)	\$276,000 (25 ft) \$386,400 (35 ft)	\$199,350 (25 ft) \$279,090 (35 ft)
2nd 20-Year Lifecycle Cost Comparison Across All Maintenance Approaches	No Savings	No Savings	Reduced cost \$29,925 (25ft) \$41,895 (35ft)	Reduced cost \$79,500 (25ft) \$111,300 (35ft)

Source: McFarland Johnson, Inc analysis, 2024.

In summary, MaineDOT will employ a comprehensive taxiway maintenance strategy that aligns with the right-size of airports and encourages access throughout the State. It is recommended that airports have at least one (1) path for larger aircraft to exit the runway safely, which is at least one (1) class higher than the designated TDG width. MaineDOT supports these recommendations to be taken into consideration in the master planning process and ensure that the TDG is identified and justified. MaineDOT will evaluate the financial importance of larger aircraft operations to the surrounding community based on functions on a case-by-case basis.

**2.3 LOW-COMPETING/HIGH-COST PROJECTS**

The FAA prioritizes projects using its National Priority Ranking System. Some projects, despite receiving low rankings within the FAA’s system, hold substantial value for an airport’s performance and growth. These projects, although costly, yield a return on investment for the airport and the community it serves and are identified as low-competing/high-cost projects. In the *Low-Competing/High-Cost projects* memo (pg. A-58 – A-62) projects were identified through the 2020 “FACE” of Maine-Airport Manager Survey, and the ACIP plans from the year 2023 – 2029 and then assessed using the *Magnitude of Cost Memo* (pg. A-1 – A7). A 20-year cost projection was then applied to the results to estimate future costs in relation to these low-ranking, high-cost projects in **Table 2-7** below.

**Table 2-7: Projected Low-Competing/High-Cost Project Costs Over 20 Years\***

Project Category	Type of Project	# of Anticipated Projects (2023 – 2029)	2023– 2029 ACIP Project Costs	Projecting 2042 @ 5% (Building) & 3% (Equipment)
Terminal	Construction	19	\$31,597,572	\$59,581,935
Snow Removal Equipment (SRE) Buildings	Construction	5	\$5,467,000	\$10,308,844
Hangars	Construction	11	\$8,045,867	\$15,171,682
Snow Removal Equipment (SRE)	Equipment Purchases	12	\$5,608,000	\$8,235,537
Mowing Equipment	Equipment Purchases	7	\$875,700	\$1,077,001
Fuel Farms	Equipment Purchases	8	\$855,500	\$7,283,927
<b>Total</b>		<b>62</b>	<b>\$52,449,639</b>	<b>\$101,658,926</b>

Source: McFarland Johnson, Inc Analysis, 2023

\*Base costs derived from 2022-dollar value

The results of the analysis show that with 62 projects scheduled within the 6-year ACIP window, there is a documented need for approximately \$52,449,639, and a funding request to allocate approximately \$47,204,675 of AIP funding (90 percent of eligible costs) to maintain these scheduled airport developments.

MaineDOT will prioritize and evaluate the facilitation of a regional approach to bulk buying power within the System for SRE and mowing equipment. The bulk buying power could allow for the purchase of more equipment than on an individual airport basis.

FAA funding for fueling systems is only available at the initial implementation of the system. Afterward, it is up to the sponsor to adequately plan and manage the system’s maintenance costs. Fuel farms are expected to be upgraded or constructed at most airports in Maine over the next 20 years. As the primary revenue source for many of the airports within the System, it is recommended that a solution to the funding gaps should be evaluated through a business plan for each of the airports during the Master Plan process.

Terminal facilities, SRE buildings, hangars, and SRE equipment, should be approached with multi-faceted funding sources, despite being fully or partially eligible under the AIP funding program. For hangar projects, it is recommended that alternative financing sources through leasing, private development tax initiatives, or directly sponsor-funded programs.

As funding requests often exceed federal funding levels, the FAA is unlikely to fund these low-competing/high-cost projects. MaineDOT will review its financial support of sponsors who acquire alternative funding sources including federal and state grants, public-private partnerships, and sponsor issued bonds on a case-by-case basis. MaineDOT will work with local partners to determine if a state cost share would be appropriate and what that amount should be, given the potential benefits of the project to the State’s transportation system. For more information on state and federal grant and loan alternative funding sources eligibility coverage for each type of project, see *Alternative Airport Funding Opportunities: System-Wide Coverage Eligibility* memo (pg. A-101 – A-111).

**2.4 FINANCIAL STABILITY OF MAINE SASP AND SURROUNDING COMMUNITIES**

The 35 airports within the Maine SASP are all publicly owned and operated. The airport sponsors range from municipalities to authorities established by local or state governments across the State. These public airports provide essential service functions to their surrounding communities. These communities benefit from emergency preparedness and response services, air transportation service availability, and the airport acts as an economic driver for the community.

Under typical circumstances for the FAA AIP grant program, the FAA funds up to 90 percent of the total project cost. MaineDOT may provide up to five (5) percent funding and the remaining five (5) percent of the total project costs fall to the airport sponsor. This does vary depending upon funding grant source and is subject for review. The *Financial Stability of Maine SASP and Surrounding Communities* memo (pg. A-63 – A-67) analyzed the tax obligations for residents in conjunction with the socioeconomic impacts of general aviation (GA) airports and their surrounding communities.

The study compared communities in proximity to airports within the State of Maine. The analysis found that the tax burden per household to cover the local match for each municipality ranged from \$12 - \$800 annually, with nearly half of the region studied falling within \$100 annually. On a county-wide scale, the annual tax increased from \$1.51 - \$46.78 to cover the local match.

According to the 2021 US census, 11.5 percent of residents in the State of Maine live below the poverty line. Understanding the State’s economic demographics helped to shape the analysis and its subsequent recommendations, given the potential resistance to tax increases. While additional taxes may pose a financial strain for certain communities, it was concluded that the social, economic, and service role made by public airports significantly offsets the financial burden to cover the costs the local share might impose on the community.

**Table 2-8**, details by city or town the annual tax burden per household and its poverty rate. This will help MainedOT and the sponsors effectively communicate and understand the economic sensitivity of the population within each region of the State.

**Table 2-8: Tax Per Household Required for Local Funding Match and Poverty Rate by City**

City/Town	Tax Per Household	Poverty Rate
Machias	\$786.09	33.7%
Millinocket	\$364.62	17.6%
Portland	\$354.85	11.8%
Norridgewock	\$313.41	21.9%
Fryeburg	\$282.96	9.7%
Presque Isle	\$211.05	15.9%
Frenchville	\$210.04	12.5%
Bangor	\$190.34	16.1%
Bar Harbor*	\$187.75	10.1%
Rockland*	\$187.55	14.0%
Princeton	\$145.46	20.2%
Brunswick*	\$145.30	8.2%
Greenville	\$125.25	7.5%
Augusta*	\$123.97	19.3%
Pittsfield	\$110.84	19.4%
Eastport	\$105.49	15.2%
Wiscasset	\$96.47	11.7%
Belfast	\$87.67	18.8%
Carrabassett	\$78.15	2.5%
Rangely	\$74.83	2.4%
Jackman	\$72.72	13.3%
Oxford*	\$70.59	14.1%
Dexter	\$47.16	14.0%
Lincoln	\$47.15	16.2%
Bethel	\$46.56	22.9%
Sanford	\$40.51	9.5%

City/Town	Tax Per Household	Poverty Rate
Houlton	\$38.50	23.1%
Old Town	\$37.77	21.2%
Auburn**	\$27.42	11.1%
Biddeford	\$21.11	13.3%
Caribou	\$18.64	13.8%
Lewiston**	\$12.68	16.3%
Waterville	\$12.75	23.1%

Source: McFarland Johnson, Inc analysis, 2023, 2020 US Census, 2021 US Census, 2021 American Community Survey

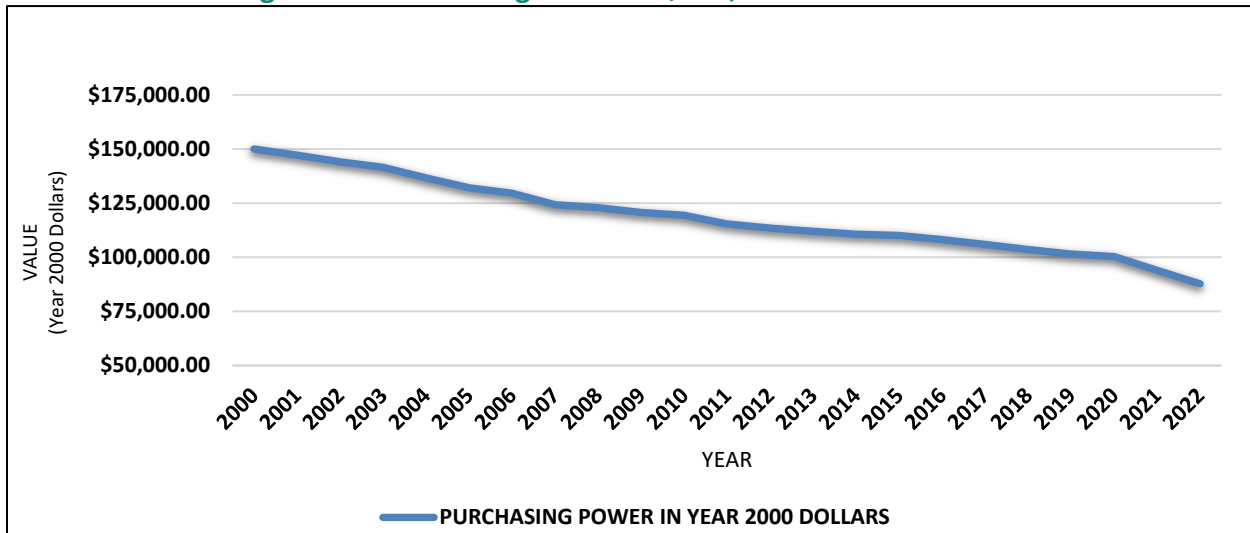
\*Funded by regional authorities such as State, County, and MRRA

\*\*The cities of Auburn and Lewiston split the local share 50 percent, however Lewiston has more households than Auburn.

## 2.5 PURCHASING POWER

Funding for eligible airport projects is often accomplished through the FAA’s Airport Improvement Program (AIP). Under typical circumstances, the AIP program provides funding of up to 90 to 95 percent of the total project cost. As of April 2024, the current AIP non-primary airport entitlement is \$150,000 annually. This amount allocated to non-primary airports was enacted by the Wendell H. Ford Aviation Investment and Reform Act of the 21<sup>st</sup> Century in 2000. The number has remained the same since then for over 20 years. The Maine System has 31 airports that are classified as non-primary airports. With the vast majority of airports within the State falling into this category, an understanding of the purchasing power of \$150,000 in the current economic climate with inflation is critical in gaining an overall insight into the financial sustainability of the System. In 2022, a study was performed by McFarland Johnson, Inc in the *Purchasing Power of \$150,000* memo (pg. A-68 – A-71) to analyze the buying power of \$150,000 against the 2022 dollar value. Due to inflation, a project that would have cost \$150,000 in the year 2000, would cost approximately \$256,500 in 2022 dollars. **Figure 2-2** displays the decrease in purchasing power of \$150,000 from 2000 to 2022.

Figure 2-2: Purchasing Power of \$150,000 From 2000 - 2022



Source: McFarland Johnson, Inc analysis, 2022

In addition to the inflationary prices, the scope of AIP-eligible projects has expanded since 2000, increasing the amount of competition in the AIP program.

Since non-primary airports have fewer opportunities for funding through Passenger Facility Charges (PFCs), bond proceeds, and non-aeronautical operating revenue, they are more reliant on federal grants to pay for the costs of airfield pavement maintenance and repairs, safety, and security projects.

As of May 2024, the 2023 FAA Reauthorization Act was passed and signed into law. The bill increases the AIP funding from \$3.35 Billion per year to \$4.0 billion per year. With the proposed increase in AIP funding, airports with commercial services, whose annual enplanements fall below 10,000, their potential non-primary entitlement would be based on a sliding scale depending on the number of enplaned passengers from \$150,000 up to \$1.3 million annually.<sup>1</sup> This would affect Bar Harbor, Augusta, and Knox County.

As the State has many non-primary designated NPIAS airports in the System, the issue lies with how far the current standard of \$150,000 entitlement can go with its purchasing power. The analysis shows that with the increase in inflation and rising costs of goods, services, and labor; entitlement does not reach as far as it did 20 years ago. Because there are limited options for funding through the AIP program, MaineDOT and the sponsor must advocate for their airports to receive funding through alternative federal, state, and local funding programs. Non-primary entitlement funding may be supplemented by loans and grants available to airports in the State

<sup>1</sup> H.R.3935. Date Accessed May 20,2024.

<https://www.commerce.senate.gov/services/files/070A7E5D-A95A-42D8-99D2-60DEA347EE32>



of Maine, including those available through the Northern Borders Regional Commission (NBRC), the United States Economic Development Administration (EDA), the United States Department of Agriculture Rural Development (USDA), and the Transportation, Housing and Urban Development and Related Agencies (THUD). MaineDOT will work with airport sponsors to identify applicable grants from the organizations above that can be used to cover the gaps in funding for projects and collaborate in the application process.

**2.6 STATE BLOCK GRANT PROGRAM**

The application of the State Block Grant Program (SBGP) for MaineDOT to administer was evaluated in the *State Block Grant Program* memo (pg. A-72 – A-75). **Table 2-9** details the advantages and disadvantages of implementing a State of Maine SBGP.

**Table 2-9 Advantages and Disadvantages of State of Maine SBGP**

Advantages		Disadvantages
1	<b>MaineDOT's Proximity and Understanding of Airports</b>	<b>Cost of Administration of SBGP</b>
	An SBGP would allow MaineDOT to provide informed recommendations tailored to airports' needs, as they have close ties to each airport and the airports' integration into the broader system of the SASP.	The cost of administration of the SBGP falls onto MaineDOT and is estimated at \$800,000 , in 2022 dollars, including the increase in required personnel to manage and administrate the program.
2	<b>Flexibility and Optimization</b>	<b>FAA Regulations and Requirements</b>
	An SBGP would allow MaineDOT to flexibly combine and optimize funding to complete projects more efficiently through strategic utilization of non-primary entitlement (NPE) funding and state apportionment. Also, MaineDOT would have the flexibility to issue subgrant offers to airport sponsors throughout the year to accept grants during critical periods thus preventing loss of federal funding.	The resources and funding required for this SBGP would necessitate adherence to the funding restrictions and eligibility criteria set forth by AIP program regulations (i.e. only AIP-eligible projects.).
3	<b>Centralized Funding Approach</b>	<b>Regulatory Compliance Mandates</b>
	The SBGP would establish a singular authority with direct system knowledge to oversee the program, streamline the AIP approval process for eligible projects, reduce duplicate funding efforts for airport sponsors, and facilitate coordination between airports and state/federal environmental agencies to ensure reasonable and appropriate levels of environmental mitigation.	MaineDOT is expected to comment on airspace studies, however they have no jurisdiction.
4	<b>Continuous Funding and Project Continuity</b>	<b>Continuity Risks</b>
	The SBGP would allow MaineDOT to receive more Period of Performance (PoP) time on expiring NPEs by converting expiring NPEs to State Apportionment (SA), which MaineDOT can use on airports for another four (4) years.	Change in MaineDOT and other state leadership can lead to potential deviations from originally established goals and objectives for the program.

Source: McFarland Johnson, Inc. analysis, 2024.

Implementing a SBGP offers benefits for the SASP, but further evaluation is required to determine its feasibility given the associated administrative costs and constraints. MaineDOT will continue to explore the SBGP's applicability and its alignment with its long-term goals. More details on recommendations for the State Block Grant Program can be found in **Chapter 6 Pathway to 2045**.

## 2.7 ALTERNATIVE AIRPORT FUNDING OPPORTUNITIES

Based on the challenges identified in the SASP, sponsors are encouraged to collaborate with MaineDOT to find alternative funding sources to help close the funding gap for projects that are critical for airport operations and the economy of the airport. Below is a listing of potential grant or loan programs. (See *Alternative Airport Funding Opportunities memo* (pg. A-76 – A-100) for eligibility information, funding ratios, maximum grant or loan amounts, examples from historical projects or future utilization cases, and application information for amplifying information):

- Northern Border Regional Commission (NBRC)
- United States Economic Development Administration (EDA)
- United States Department of Agriculture Rural Development (USDA)
  - Community Facilities Direct Loan and Grant
  - Community Facilities Guaranteed Loan Program
  - Rural Business Development Grant (RBDG)
- Transportation, Housing and Urban Development and Related Agencies (THUD)

Each grant and loan program has its own unique application process and ranking system and may change as the years progress. The listings are based upon base eligibility requirements. MaineDOT is committed to collaborating with airport sponsors and other State and Federal agencies to investigate further the application for these grants or loans. In addition, coordination and promotion of applications with Local Development Districts (LDDs) are critical to the success of grant and loan awards.

### 2.7.1 ENABLING PRIVATE SECTOR INVESTMENT

It is strongly recommended that airport sponsors explore suitable business opportunities and alternative funding sources for development to capture opportunities for private sector investment. The appropriate private sector investments in facilities can benefit the economy of the local community and the airport. These funding approaches allow the liabilities and financial resources of capital for infrastructure investment and management of facilities to fall onto the private sector while the airport can collect revenues in the form of a designated fee structure from the lease of the properties. This opens the airport's funding resources for priority projects and coverage of operating costs to enhance self-sustainability. The optimal private sector partnership should foster an environment where growth for one supports the growth of another.

Below are examples of the private sector investment funding opportunities:

- Private hangar leasing investment and management
- Private fuel farm management
- Land redevelopment and leasing for non-aeronautical parks or other revenue-generating land uses

MaineDOT is exploring the opportunities for public-private partnership at Deblois Flight Strip to include a new hangar development and research and development opportunities such as advanced air mobility and other emerging technologies. MaineDOT will continue to foster private development opportunities as they arise for all public use airports.

### 2.8 ALTERNATIVE FUNDING OPPORTUNITIES: SYSTEM-WIDE COVERAGE ELIGIBILITY

The application of eligible cost coverage of alternative state and federal funding opportunities were analyzed in the *Alternative Funding Opportunities: System-Wide Coverage Eligibility* memo (pg. A-101 – A-111) for the following project types:

- Ineligible Crosswind Runways
- Fuel Farm Rehabilitation and Replacement
- Terminal Upgrades
- Hangars
- Snow Removal Equipment (SRE) Buildings

The total project cost estimates by airport for each project type were based upon either a life-cycle cost analysis of recommended pavement management or the ACIP identified from the year 2023 – 2029. For applicable project types, eligible state and federal grants or loans were then applied to the cost estimates to project the base eligibility coverage. For project types that did not have an estimated cost, additional funding solutions are recommended including a regional approach and bulk purchasing.

# 3. Maine SASP Economic Impact Analysis and Case Studies

## INTRODUCTION

One of the major system recommendations from Phase I that was advanced forward to Phase II was to conduct an Economic Impact Analysis of the entire aviation system in order to quantify the economic effect of the aviation industry on employment, income, and tax revenue created for the State of Maine through aviation. In addition to the Economic Impact Analysis, case studies were conducted and incorporated in the SASP to highlight unique economic contributions created by aviation to the State’s overall economy. This analysis aligns with the Phase I recommendation to focus on the education and promotion of the value of the entire State’s aviation system. Furthermore, this analysis highlights the direct contributions created by the aviation industry and how it benefits surrounding communities and the State’s economic landscape as a whole.

Included in this chapter is a summary of the following:

- Analysis of State-wide Impacts created by the Aviation Industry
- Case Studies highlighting Aviation Stakeholders Unique to Maine

See **Attachment 1** for a full version of *the Maine State Aviation System Plan Economic Impact Analysis and Case Studies* and **Attachment 2** for *State-Wide Economic Impacts of Aviation by Airport* for all the 35 airports within the System.

### 3.1 SUMMARY OF STATE-WIDE IMPACTS OF AVIATION IN MAINE

**Table 3-1** summarizes the employment, income, and output economic impacts of all 35 public use airports within the NPIAS.

**Table 3-1 State-Wide Impacts of Aviation in Maine (2022)**

Commercial Service Airports				
LOC ID	Airport Name	Employment	Income	Output
AUG	Augusta State	101	\$6,002,300	\$14,005,600
BGR	Bangor International	2,808	\$141,333,700	\$341,980,000
BHB	Hancock County - Bar Harbor	123	\$6,789,100	\$18,166,700
RKD	Knox County Regional	243	\$13,325,200	\$41,118,600
PWM	Portland International Jetport	10,007	\$479,495,300	\$1,175,466,500
PQI	Presque Isle International	358	\$29,443,900	\$83,501,100
<b>Total Commercial Service</b>		<b>13,640</b>	<b>\$676,389,500</b>	<b>\$1,674,238,500</b>

General Aviation Airports				
LOC ID	Airport Name	Employment	Income	Output
LEW	Auburn/Lewiston Municipal	101	\$5,506,600	\$16,282,900
BST	Belfast Municipal	11	\$526,500	\$1,711,200
OB1	Bethel Regional	16	\$789,400	\$1,484,100
B19	Biddeford Municipal	18	\$1,079,000	\$3,013,100
BXM	Brunswick Executive	149	\$8,411,300	\$21,722,500
CAR	Caribou Municipal	13	\$607,300	\$2,201,900
OWK	Central Maine Regional	6	\$281,900	\$713,700
44B	Charles A. Chase Jr. Memorial Field	2	\$49,900	\$120,100
OLD	Dewitt Field, Old Town Municipal	49	\$3,519,200	\$6,300,500
1B0	Dexter Regional	16	\$851,200	\$2,558,600
IZG	Eastern Slope Regional	7	\$330,400	\$998,400
EPM	Eastport Municipal	14	\$580,800	\$2,199,300
3B1	Greenville Municipal	6	\$180,100	\$560,100
HUL	Houlton International	16	\$793,300	\$2,484,900
57B	Islesboro	1	\$34,500	\$93,200
LRG	Lincoln Regional	29	\$1,812,600	\$5,311,900
MVM	Machias Valley Municipal	8	\$339,000	\$1,143,200
MLT	Millinocket Municipal	16	\$842,000	\$1,820,100
59B	Newton Field	15	\$871,900	\$2,614,300
FVE	Northern Aroostook Regional	9	\$446,500	\$1,469,800
81B	Oxford County Regional	26	\$1,266,400	\$2,598,900
2B7	Pittsfield Municipal	33	\$4,454,800	\$7,440,200
PNN	Princeton Municipal	13	\$543,200	\$1,915,600
SFM	Sanford Seacoast Regional	110	\$6,242,400	\$15,032,100
8B0	Stephen A. Bean Municipal	30	\$1,331,600	\$4,692,800
93B	Stonington Municipal	0	\$12,500	\$24,800
B21	Sugarloaf Regional	10	\$477,800	\$1,196,400
WVL	Waterville Robert LaFleur	49	\$2,711,600	\$6,593,600
IWI	Wiscasset	11	\$501,800	\$1,611,700
<b>Total General Aviation</b>		<b>784</b>	<b>\$45,395,500</b>	<b>\$115,909,900</b>
<b>Grand Total</b>		<b>14,422</b>	<b>\$721,785,000</b>	<b>\$1,790,148,400</b>

Source: 2022. Maine State Aviation System Plan Economic Impact Analysis and Case Studies – Final Technical Report

### 3.2 CASE STUDIES

In addition to the Economic Impact Analysis, the following case studies were developed to highlight four of Maine’s aviation industry stakeholders and their unique contribution to the State’s economy:

- Deblois Airstrip and Blueberry Industry
- Outdoor Recreation/Seaplane Operator(s)
- Penobscot Island Air/Air Charter Operator
- LifeFlight/Emergency Medical Operator

## 4. Performance Metrics and Standards

### INTRODUCTION

A system recommendation from Phase I that was advanced to Phase II was to evaluate and develop recommendations for sponsor performance metrics regarding the upkeep of airport facilities and services.

Included in this chapter is the summary of the following:

- Sponsor Performance Metrics
- Minimum Facility and Service Requirements

### 4.1 SPONSOR PERFORMANCE METRICS

The Sponsor Performance Metrics were developed by MaineDOT, as guidance consisting of 12 recommended best practices and procedures meant to improve airport safety, operational efficiency, infrastructure readiness, and financial sustainability. These practices are designed to strengthen airport operations and enhance their benefits to the surrounding community, and the overall State Aviation System.

See **Appendix B** for a full version of the *Sponsor Performance Metrics* Memorandum (memo) (pg. B-1 – B-10) summarized as follows:

#### 1. MAINTAIN A CURRENT FAA APPROVED MASTER PLAN AND ALP

A relevant and up-to-date Federal Aviation Administration (FAA) approved Airport Master Plan (AMP) is vital to ensure airports have a clear direction of their paths forward. The comprehensive planning process inherent in master planning and the preparation of the Airport Layout Plan (ALP) greatly enhances the chances of successful operation at an airport, as it fosters an alignment of the future direction of the airport with the sponsor, MaineDOT and the FAA. Therefore, sponsors are required to update their Airport Master Plan and the associated ALP every 6 - 10 years. The principal objective of this metric is to promote the sponsor's commitment and adherence to achieved targeted goals for the airport and its community. As a contributor to the master planning process, MaineDOT is committed to participating in the planning, financing and oversight of initiatives to achieve completion of the projects outlined on the AMP. Additionally, MaineDOT will maintain a record of approved AMPs and ALPs for each state airport and monitor the status of sponsor projects outlined in the AMP.

## 2. PAVEMENT CONDITION AND MAINTENANCE

The condition and maintenance of the pavement at the airport are essential to ensuring the safety and reliability of the airfield. Pavement is the largest asset across the State Aviation System. Both the sponsor and MaineDOT have a vested interest in ensuring the pavement is maintained in good condition and does not go into disrepair. Sponsors are required to develop and implement a Pavement Management Plan (PMP) as an obligation from the acceptance of a FAA grant offer. They are also required to conduct a pavement condition index (PCI) assessment for their airport pavements.

MaineDOT will lead this initiative and conduct a state-wide Pavement Condition Index (PCI) study every 3 -5 years for all non-primary classified airports. As part of every PCI review, MaineDOT will provide the airport with a Pavement Maintenance Plan designed to maintain the serviceable life of the airport's pavement to the maximum extent. MaineDOT will create a repository of accepted PMPs and track progress and implementation through annual CIP meetings with the airport management. Primary airports are responsible for scheduling their own PCI every 3-5 years and developing and maintaining a PMP reflective of their categorical level 3.

## 3. INSTALLATION AND MAINTENANCE OF FUEL SYSTEMS

An airport's fueling system is part of its critical infrastructure. Successfully maintaining and updating the fuel system allows the airport to generate revenue and attract more based aircraft. The FAA provides funding for the initial investment to build the infrastructure, but afterwards it is up to sponsor to address any rehabilitation or reconstruction efforts required. Because of the nature of the fueling system's revenue generation and expenses, each airport needs to manage the system like a business. This metric reflects how sponsors adequately plan and manage system upkeep. It is recommended that each airport incorporates capital, operational and maintenance costs in strategizing cost recovery and formally document this analysis.

MaineDOT will monitor airport fueling rates system-wide, and work with sponsors to establish business plans to improve revenue generation. Additionally, MaineDOT will monitor emerging technology on the development of unleaded aviation gas, and other non-carbon-based fuel sources. As technology develops to support implementation of these sustainable fuel sources for general aviation use, MaineDOT will work with the FAA and airport sponsors to bring these fueling sources to state airports.



#### 4. CLEAR APPROACHES/OBSTRUCTION REMOVAL/VEGETATION MANAGEMENT

Vegetative management, clear approaches, and obstruction removal at airports was found to be a major challenge during Phase I. This metric requires sponsors to identify and create a realistic and actionable implementation plan to maintain clear approaches to the airport, mitigate obstructions, and manage vegetation for a safe and sustainable airport. The FAA provides a database of known obstructions through the Airport Data and Information Portal (ADIP). Airport sponsors are expected to ensure that their facilities are up to date in the ADIP as it is an important part of communicating existing conditions with the FAA.

MaineDOT will create a repository of the Obstruction and vegetation management plans on file and track progress through CIP meetings. MaineDOT may also be able to support the procurement of equipment statewide with an effort to reduce costs through an economy of scale by batching with MaineDOT procurement of similar equipment.

#### 5. SNOW REMOVAL AND DEICING EQUIPMENT CONDITION AND MAINTENANCE

Snow and ice control was found to be a major challenge for airports in Phase I. The aim of this metric is to strategize, develop and execute best practices for snow and ice techniques and methodologies specific to the airport.

The conditions and maintenance of the Snow Removal Equipment (SRE) and SRE storage facilities are paramount to their operational efficiency and their potential to reach their useful life expectancy. The principal aim of this metric is for sponsors to develop, implement, and maintain a method of monitoring and tracking maintenance efforts for SRE and SRE storage facilities. Sponsors should be able to produce maintenance performance records upon request by MaineDOT.

#### 6. AIRFIELD LIGHTING AND NAVIGATIONAL AIDS - CONDITIONS AND MAINTENANCE

Airfield lighting and navigational aids conditions and maintenance efforts are critical to the safety of the airfield and aviation operations. Navigation aids (NAVAIDs) are owned and maintained by the FAA. The primary goal of this metric is for sponsors to routinely inspect and monitor the conditions of the airfield lighting equipment. To alleviate impediments of maintenance efforts it is recommended that MaineDOT support the accessibility of pre-qualified airfield lighting technicians. Details on this recommendation are found in **Chapter 6 Pathway to 2045**.

#### 7. FINANCIAL SUSTAINABILITY

The method and definition of achieving financial sustainability is a goal that is unique to each airport's setting due to their particular economic, communal, and environmental factors. The primary goal of this metric is to emphasize that each airport should operate in a fashion that is

as self-sustaining as possible, minimizing the financial burden on their respective municipalities. It is recommended that each airport review their facility through a business-minded approach that is specific to their airport’s needs and objectives. Sponsors shall review hangar leasing, strategic planning for development, and/or other alternative revenue sources to aid in reaching the airport’s fiscal goals. MaineDOT will create a repository of financial plans to have on file and track leasing rates and charges across the System for the baseline establishment of fair market value.

**8. HISTORY OF SPONSOR FISCAL AND GRANT COMPLIANCE MANAGEMENT**

This metric is to measure the sponsor’s financial commitment to the CIP process through successfully managing FAA AIP grant entitlement funds and other financial awards including private investment. The sponsor’s ability to adequately manage financial investment impacts the entire State Aviation System. MaineDOT is aware that circumstances may arise that can hinder the sponsor’s ability to match grants including incompatible timing of the federal grant cycles with a municipalities’ funding and approval process. Additionally, it is well documented seasonal weather cycles and logistical and labor shortages can have an adverse impact on system management. However, it remains the responsibility of the sponsor to meet their requirements or to communicate early with MaineDOT should problems develop. With enough notice, assistance can be provided and/or funds can be transferred to avoid loss of resources. MaineDOT will track sponsor’s history of fiscal management, adherence to grant compliance requirements and communication throughout the grant life cycle process. Airport management is responsible for reviewing and maintaining the hangar facility, ensuring regular upkeep, and overseeing lease compliance with FAA to uphold fair market value.

**9. SPONSOR PROJECT PERFORMANCE PERIOD**

The goal of this metric is to foster commitment and open communication between MaineDOT and sponsors regarding adherence to project progress and closeout timelines. This will support MaineDOT with accurately managing cashflow. This metric requires sponsors to submit regular project status reports to MaineDOT. Project closure is required within four (4) years, but sponsors are encouraged to take proactive measures to close out grants once complete. MaineDOT will track grant time frames. The State’s grant management database (CAPLAN) is a platform that will streamline communication of the project status and directly address this metric. It is the sponsor’s responsibility to update the information into the system in a timely fashion.

**10. SPONSOR PROJECT COMMUNICATION**

Project communication is the key to successful project performance. This metric requires sponsors to have consistent and timely communication with MaineDOT to convey project performance milestones and address any significant unforeseen projects delays or fiscal issues. MaineDOT maintains a list of project milestone dates for System projects. Reporting requirements for all infrastructure projects are covered and delineated in the initial project scoping meeting. MaineDOT tracks sponsors’ communication performance in accordance with sound project management principles.

**11. ACTIVITY REPORTING (GARD OPERATIONS)**

MaineDOT has invested in providing General Audio Recording Device (GARD) systems across the System. The GARD units are used for safety monitoring and recording of airport operations. This metric requires sponsors to actively monitor the system for accurate operation and to observe and report GARD activity on a regularly scheduled basis. MaineDOT requests regular reporting of each airport’s GARD activity. The GARD system provides a means of measuring airports’ operational activity performance - the target standard is for an airport to maintain operations at 60 percent or more of their annual peak recorded operational capacity.

**12. CIVIC ENGAGEMENT AND COMMUNITY SPONSORSHIP**

Airports are encouraged to engage with their local communities to gain public support for the airport. Civic engagement can include many different endeavors and does not solely equate to raising revenue for the airport. Encouraging and participating in local activities to bring people to the airport will help grow interest in aviation. Activities that encourage STEM activities and having the community visit their local airport can be used to build support for aviation and workforce development. Additionally, such activities give the aviation industry a chance to showcase our value to the public and build support for general aviation.

MaineDOT will regularly review the implementation and results provided by the utilization of these best practices. Adherence to these practices will provide benchmarks that will be used to evaluate operational efficiency of the Maine Airport System, as it relates to peak operational performance. Additionally, recording and analyzing results will provide data points that can be used to provide trends and facilitate fiscal decision making on the best use of limited fiscal funds.

#### 4.2 MINIMUM FACILITY AND SERVICE REQUIREMENTS

Minimum facility and service requirements were analyzed in the *Minimum Facility and Service Requirements* memo (pg. B-11 – B-29) for all 35 Maine public-use airports. Deficiencies were identified in the areas of runway length and width, taxiway access, apron size, instrument approaches, visual landing aids, airfield lighting, weather reporting, and snow removal equipment. These areas of interest were analyzed in the context of their ability to support aeromedical flights, which are of particular interest to MaineDOT as these flights serve as a lifeline for critically injured patients, and those requiring specialized medical transportation. Given the prevalence of LifeFlight of Maine and its robust operations with the Beechcraft King Air 200 (BE20), the areas of interest were analyzed for their ability to accommodate the BE20 operations. In essence, the BE20 was selected as the critical design aircraft for all of Maine's public-use airports, setting a goal of designing these airports to meet the demands of that particular aircraft. The memorandum goes into detail regarding all of the areas mentioned above and provides recommendations to enhance the safety and efficiency of aircraft operations at all of Maine's public-use airports. Shortfalls identified in the analysis should be priority action items for applicable airports on their annual Capital Improvement Plan (CIP) cycle.

See **Appendix B** for a full version of the *Minimum Facility and Service Requirements* Memorandum (memo) (pg. B11 – B29) summarized in this chapter.

# 5. State Priority Guidance for Competitive Projects

## INTRODUCTION

One of the major system recommendations from Phase I that was advanced to Phase II was the development, assessment, and application of a State Priority Ranking (SPR) model. The SPR model was designed to evaluate and rank airport projects in a reasonable, consistent, and transparent manner. The initial goal of the SPR model was to provide a metric ranking for MaineDOT to determine which projects to prioritize in a fiscally constrained environment. MaineDOT is frequently tasked with making funding decisions for projects, all of which hold value for the System and its functions.

The model was developed and applied to a sample set of FY 2024 Airport Capital Improvement Projects (ACIP). While the SPR model produced mathematically reasonable results, discussion and feedback with MaineDOT and the Public Advisory Committee (PAC) raised substantial reservations about solely relying upon an automated, numerical approach. This method precluded MaineDOT discretion and its ability to utilize qualitative considerations. Consequently, it was determined that the true value of a SPR model lies in its criteria which serve as guidance to help airports enhance the competitiveness of their projects, rather than in its absolute metric ranking.

Based on the above-outlined findings, this chapter details those specific aviation criteria which were reviewed in SASP Phase II. The analysis and information remain relevant and is provided here to guide airports in enhancing their competitiveness of projects based upon the framework and principles established in the conception of the SPR model.

This chapter provides a summary of the following:

- SPR Model Design
- SPR Model Criteria
- SPR Model Output
- SPR Model Results and Application

See **Appendix C** for a full version of the *State Priority Ranking Model* memorandum (pg. C-1 – C-33).

### 5.1 SPR MODEL DESIGN

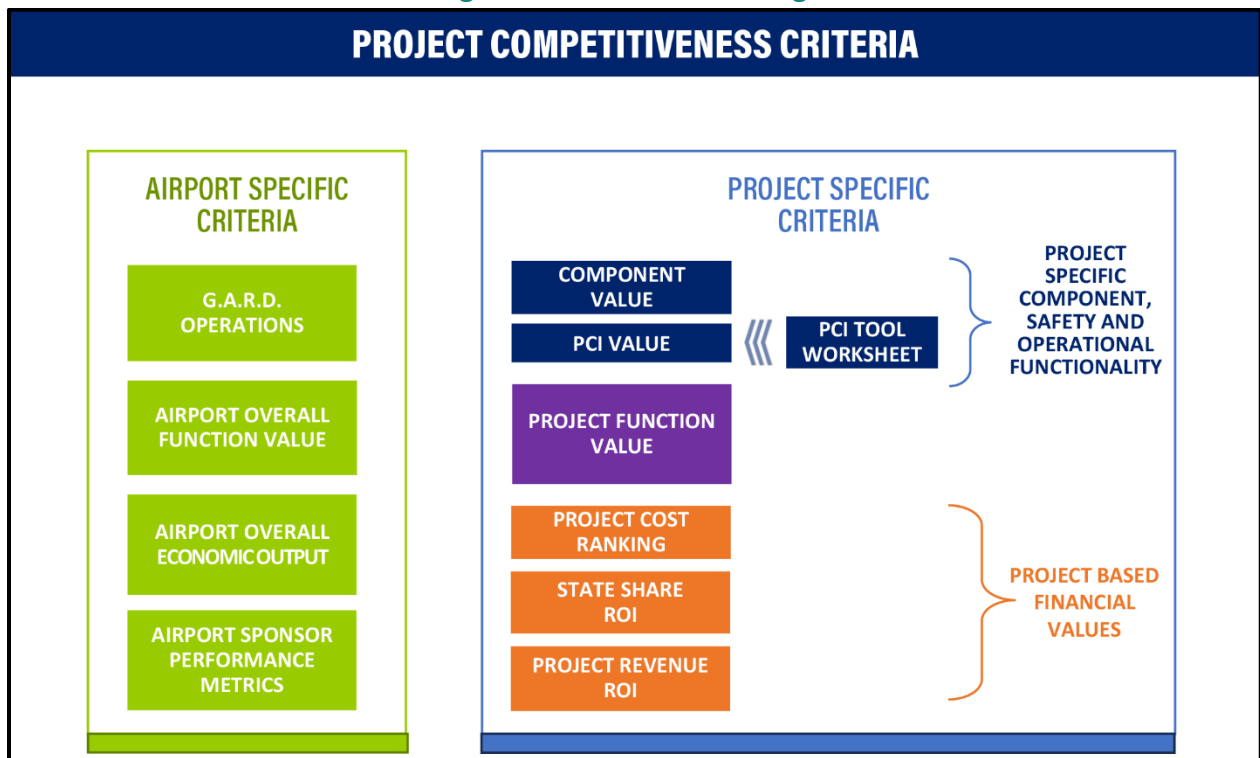
The SPR model was developed as a dynamic system model in a Microsoft Excel-based platform to allow the user to input airport project information. The model then ranks each project by the National Plan of Integrated Airports (NPIAS) service role and project type.

The SPR model was developed based on the following criteria:

- Existing Pavement Condition Index (PCI) rating, project cost, and national priority ranking scores
- Airport Activity Levels based on new General Audio Recording Device (GARD) data
- Function or services being supported
- Improvement to the financial sustainability of the airport
- Special condition/use nuances
- MaineDOT General Aviation Airport Annual Inspection Report Card
- Airport economic impacts
- Eligible funding sources and percentages.

These individual elements, where feasible, were incorporated into the model’s design and functionality. **Figure 5-1** outlays the model design.

Figure 5-1: SPR Model Design



Source: McFarland Johnson, Inc, 2024

## 5.2 SPR MODEL CRITERIA

The criteria used for the model was designed to account for specific scoring metrics for the airport and the individual airport project. Each aspect of the airport and the project possess merit and importance in its regard. Thus, consideration of their individual weights was incorporated into the model design and in the final ranking calculations.

Although the analysis done in SASP II rejected use of a numerical scoring system, the model still provides value in reviewing an airport's efficiency and asset utilization. The value of the model is in providing guidelines for management to access projects for their ability to "right-size" an airport based on its role in the State System. MaineDOT will apply the following criteria from the model when evaluating airport project competitiveness, with value placed on both the airport and the specific project:

- Airport Overall Function Value
- Airport Overall Economic Value
- Airport Sponsor Performance Metrics
- Airport GARD Operations
- Project Component Value
- Project PCI Value
- Project Function Value
- Project Cost
- Project State Share ROI
- Project Revenue ROI

### AIRPORT-SPECIFIC SCORING CRITERIA

The airport-specific scoring metrics included the following criteria:

- **Airport Overall Function Value** – This scoring criterion assessed an airport's overall emphasis on the performance of each of its functions and the services it supports for its community. The functions were derived from the five (5) Federal Aviation Administration (FAA) asset function categories:
  - Emergency Preparedness and Response
  - Critical Community Access
  - Other Aviation Specific Functions
  - Commercial, Industrial, and Economic Activities
  - Destination and Special Events

A weight was assigned to the functional categories, with a focus on prioritizing essential functions of emergency preparedness and response and critical community access given their vital role in the aviation system.

- **Airport Overall Economic Output** – This scoring criterion assessed an airport’s overall economic output based on the results of the 2022 *Maine State Aviation System Plan Economic Impact Analysis and Case Studies*. Each airport was compared against other airports within its same NPIAS service role designation. The approach was to rank airports in relation to their NPIAS service role designation rather than against all the airports to offset any biases in comparing the economic output of larger-sized commercial service airports with smaller non-primary airports. A percentile rank was applied to each airport within its designated NPIAS service role. This scoring favored airports with a greater economic output as it would provide a greater benefit to the local community and the State.
- **Airport GARD Operations** – This scoring criterion assessed the activity levels by airport through a percentile rank against all 35 airports within the SASP. Airports with higher activity levels gained a more favorable score due to their ability to enhance connectivity for the State of Maine and reach a wider population segment.
- **MaineDOT General Aviation Airport Annual Inspection Report Card** – This scoring criterion was considered in alignment with the Airport Sponsor Performance Metrics. It was determined these metrics were best suited to be excluded from the SPR ranking model as they represent more qualitative factors that cannot be easily quantified on a statewide level. More details on Airport Sponsor Performance Metrics and its system recommendations can be found in **Chapter 4 Performance Metrics and Standards**.

#### PROJECT-SPECIFIC SCORING CRITERIA

The project-specific scoring metrics addressed the following criteria:

- **Component value** – This scoring criterion incorporated the FAA National Priority Ranking score component element based on the project type and/or location. The scoring favored components and/or locations that pertained to the safety, security, and sustainability of the airport at a higher significance than other components that are not as critical to the airport’s overall function.
- **PCI value** – This scoring criteria assessed the overall PCI value of a project. The pavement conditions of an airport are critical to the safety of the airfield and the functionality of the airport and an important factor to the overall project score. For projects that involve pavement, the PCI value is scored. For projects that do not involve pavement, the lowest score is given for a project.

The PCI value scoring criteria used a weighted rank system based upon the base year PCI and the 5-year forecasted PCI of the maintenance and rehabilitation (M&R) requirements of preventive maintenance, major rehabilitation, or reconstruction. The



scoring criteria incorporated safety as well as taking into consideration the life-cycle cost of the State's Pavement Management Program (PMP) of each of the M&R approaches.

- **Project Function Value** – This scoring criterion assessed how a project supports the performance of the overall airport's functions. Similar to the airport overall function value, a weight is assigned to each function with priority given to essential community functions of emergency preparedness and response and critical community access.
- **Eligible Funding Sources and Percentages** – This scoring criterion was broken out into two (2) elements: Project Cost Ranking and State Share Return on Investment (ROI).
  - **Project Cost Ranking** – This scoring criterion assessed the total state share of the project cost and ranked it as a percentage of all the state share project costs. Favorability was given to less costly projects as they would require fewer financial contributions from the State in a fiscally conservative environment.
  - **State Share ROI** – This scoring criterion assessed the state share match for each project. Scoring was based on the required state share percentage for each project. For example, if the state was only required to provide five (5) percent, then the state share ROI score was given a 9.5 out of 10. This scoring method gives favorability to projects with a lower cost burden to the State.
- **Improvements to the financial sustainability of the Airport** - This scoring criterion assessed the economic ROI for a project by looking at the investment by the State in relationship to how the project will help the sustainability of the airport. The scoring of this criteria is based on the airports and MaineDOT's interpretation of the ROI. Since this information might not be readily attainable or available it was determined that the criterion was not feasible for use in the SPR model design.
- **Special Use and Nuances** – This scoring criterion allows for the circumstances where a project would be classified as a special use and nuance project. These types of projects can include emergency measures required for safety, new and emerging technologies projects, and other projects that are critical in achieving MaineDOT SASP Goals. These cases would be under the discretion of MaineDOT and provided with justification. The scoring for this category overrides the score of the project to place it at the top of the ranking.

### 5.3 SPR MODEL OUTPUT

The design of the SPR ranking system considered two major components of projects: the Airport Specific Scoring Criteria and the Project Specific Scoring Criteria. Both components were combined to calculate a total project score which was then applied to the overall ranking, ranking by service role, and ranking by project type.

### 5.4 SPR MODEL RESULTS

The SPR model was developed and applied. It was determined that the primary value of the model is in the established criteria. These criteria enhance and ultimately justify application requests by airports for potential MaineDOT funding outlined in **Chapter 6 Pathway to 2045**, rather than a strict quantitative ranking of the SPR model. MaineDOT's commitment to the functionality and sustainability of the well-established aviation transportation network requires considering all airport projects and their role within the System as a whole. By using these guiding criteria, airports provide MaineDOT with the necessary insights to evaluate projects comprehensively and make well-informed decisions. In scenarios where differentiation among equivalent applications is required, MaineDOT may utilize the SPR model to make a final determination.

## 6. Pathway to 2045

### INTRODUCTION

The Phase I portion of the State Aviation System Plan (SASP) identified four overarching themes facing the State system:

- Funding Challenges
- Right-Sizing Facilities and Aviation Infrastructure Across the State
- Maintenance and Staffing Challenges
- Education, Collaboration, and Work Force Development

This planning document provides guidance to meet these challenges with strategic solutions and plans that capitalize on opportunities for nurturing existing system components. Importantly however, this document encompasses not just a solution for today's challenges but also provides guidance on solidifying and strengthening the System on its pathway to 2045. By building upon the State's well-established aviation network, the SASP ensures our Aviation System remains functional and positioned as a key spoke in MaineDOT's multi-modal transportation system. The SASP embodies MaineDOT's mission of utilizing available resources to provide safe and reliable transportation access for all people of Maine.

Included in this Chapter is a summary of the following:

- Master Planning Efforts
- Strategic Solutions for Funding Challenges
- Right-Sizing Facilities and Infrastructure Needs Across the State
- Strategic Solutions: Maintenance Challenges
- Strategic Solutions: Education, Collaboration and Work Force Development
- MaineDOT's Aviation Grant Management Program - CAPLAN
- Emerging Technologies
- Development of Loring International Airport in Support of Maine's Aerospace Industry

### 6.1 MASTER PLANNING EFFORTS

MaineDOT will hold airports accountable for maintaining an up-to-date Airport Master Plan and/or Airport Layout Plan. The Master Plan is an actionable plan that serves as the foundation for future objectives and priorities that will be used to drive the Capital Improvement Plan (CIP) for the Airport. **Appendix D** outlines the age, if applicable, of the current Airport Master Plan Update (AMPU) and Airport Layout Plan Update (ALPU) for airports within the System (pg. D-1).

To address the challenges of the master planning efforts, the SASP details the following required topics to be reviewed within individual airport master plan updates. Documenting compliance is just as important as documenting areas of deficiencies. At a minimum, the following components should be addressed:

- AIP Ineligible Crosswind Runways
- Taxiway Widths Beyond the Taxiway Design Groups (TDG)
- Clear Approaches, Obstruction Removal, And Vegetation Management
- Minimum Facility Requirements
- Pavement Maintenance Plans
- Fuel Systems
- Terminal Facilities
- Hangars
- Snow removal equipment (SRE) and SRE facilities
- Alternative Funding Opportunities

**6.1.1 STATE-WIDE PAVEMENT MANAGEMENT PLAN**

In 2025 MaineDOT will conduct a comprehensive analysis of airport pavements across the System concluding with a web-based interactive Airport Pavement Management System (APMS) database tool and training for airports. This commitment by MaineDOT to preserve and strengthen the pavement assets of the System is a collaborative endeavor with airport managers. The APMS tool will establish an inspection schedule, pavement inventory for record keeping, pavement performance models, guidance defining pavement critical PCIs, prioritizing guidelines, maintenance cost and work policies, major rehabilitation and reconstruction unit costs, and annual budget information. MaineDOT expects that airport managers and sponsors will use the results of the system-wide APMS tool to inform their Capital Improvement Program (CIP) requests and maintain their airfield.

**6.1.2 BUSINESS PLANS**

Throughout this planning document, it was frequently identified that financial-driven decision making would greatly benefit the airports in their initiatives. It is recommended that airports invest in creating a business plan and identify strategies to position themselves to leverage revenue-producing opportunities and address financial and funding challenges. Developing a business plan should be conducted as a follow-on to the master plan process. This is due to several components of the analysis including data collection efforts that can overlap with master planning efforts. Below is a list of some potential areas of focus in business planning efforts:

- Fuel Systems
- Terminal Facilities and Aprons
- Hangars and Lease Rates
- State Aviation Excise Tax and Airport Usage Fees
- Non-Aeronautical Revenue Sources Available to the Airport (Solar Farms, Battery Essential Storage Systems, etc.)
- Crosswind Runways for Alternative Non-Aeronautical Land Use
- Operations and Maintenance Requirements – Combined Use of Regional Assets

Funding for business plans may qualify under the Rural Business Development Grant (RBDG). It is recommended that airports which are eligible for RBDG collaborate with MaineDOT in their application.

It may prove economically efficient to combine airport business plans into regional efforts. “Batching” business plans based on region, promotes information sharing, reduces ‘trial and error’ approaches, and can improve return on investments.

## 6.2 STRATEGIC SOLUTIONS FOR FUNDING CHALLENGES

Securing adequate funding and addressing funding gaps was identified as a high priority across the System. Various factors contribute to this system-wide challenge including under-resourced municipalities, projects that are not AIP-eligible, high-cost projects that rank low on the AIP National Priority Ranking list, and insufficient AIP funding levels. (See **Chapter 2 State-Wide Costs** for additional details on these challenges). As sponsors actively seek to secure funding sources to supplement AIP, they must communicate plans with MaineDOT. The State’s ability to provide a funding match on non-Federal Aviation Administration (FAA) CIP grants will be reviewed on a case-by-case basis based on guidance provided in **Chapter 5 State Priority Guidance for Competitive Projects**. For those non-AIP projects which MaineDOT is able to participate in, the State match will be determined as part of the project’s competitive review. State and local match rates may be adjusted based on this prioritization.

There is no predetermined percentage for such projects but has historically been between two and a half percent (2.5%) to ten percent (10%) of total project cost. MaineDOT will review potential funding of these non-AIP projects at a level determined by the guidance criteria as detailed in **Chapter 5 State Priority Guidance for Competitive Projects**.

To address non-CIP eligible project funding challenges, the following is a list of initiatives that MaineDOT will explore:

- Regional Approach
- Bulk Purchasing Power
- State Block Grant Program
- Non-FAA Discretionary Funding

### 6.2.1 REGIONAL APPROACH

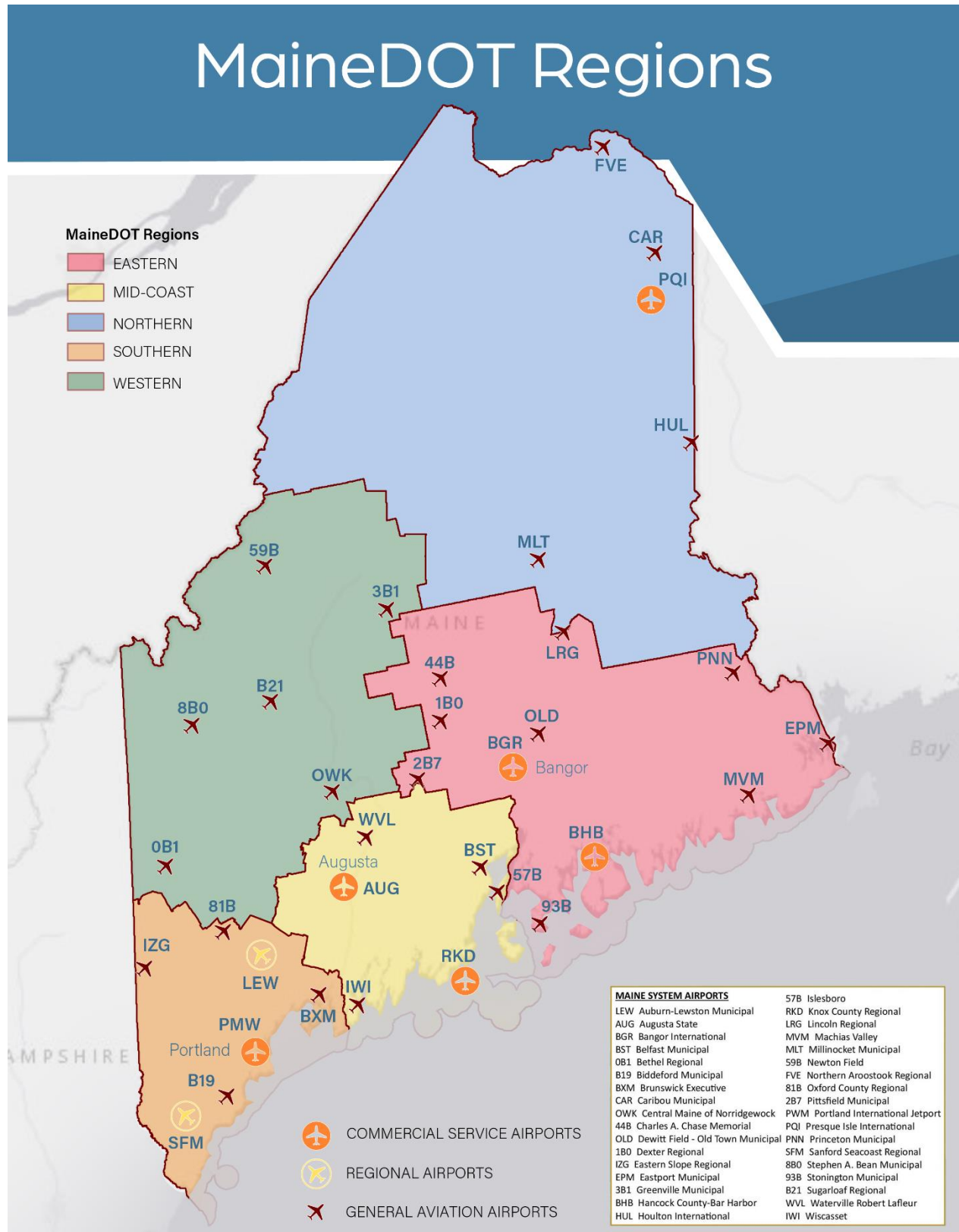
A regional approach as an economy of scale would be beneficial for the System. Many smaller-sized airports are in close proximity to one another. Each airport has its own resource challenges and strengths in the maintenance and management of their facilities. The staffing levels and maintenance resources can differ significantly across the System. A regional approach fosters a collaborative environment where airports can pool their resources to collectively support each other's management and maintenance efforts within their respective regions.

To align with MaineDOT's regional approach, the System has been divided into the five (5) regions listed below. See **Figure 6-1** of the MaineDOT Regions and the airports that fall within.

- Region 1 - Southern Region
- Region 2 - Midcoast Region
- Region 3 - Western Region
- Region 4 - Eastern Region
- Region 5 - North Region

MaineDOT will invite airports to participate in State-run highway maintenance efforts including pavement marking and crack sealing, by outwardly sharing timeframes of anticipated procurements.

Figure 6-1 MaineDOT Airport Regions



Source: <https://www.maine.gov/mdot/about/regions/> and enhanced by McFarland Johnson, Inc

MaineDOT will facilitate an initial meeting for airports by region. These meetings will encourage airports to help guide one another in dealing with both common and uncommon challenges as well as discussion on other pertinent topics of interest and collaboration.

This approach would enable cost savings across the System for individual airports with the ability to leverage bulk purchasing power or sharing inventory rather than each airport procuring materials and services independently, optimizing staffing resources and costs. In addition, this proposed program would create consistency in maintenance efforts in their adherence to FAA requirements and alignment of each respective airport's CIP with its region.

The regional approach has been exemplified with the strategic partnership of New Hampshire Department of Transportation at the Eastern Slope Regional Airport working together across state borders. MaineDOT will continue to foster this relationship. MaineDOT will explore other regions within Maine to encourage collaboration.

### 6.2.2 BULK PURCHASING POWER

MaineDOT will prioritize investigating the implementation of a state-wide batching program that leverages the bulk buying power of the following:

- SRE
- Mowing Equipment
- Crack Sealing and Marking Equipment and Supplies
- PCI Inspections
- Business Plans
- Spare Parts for Equipment

Upon determination of feasibility, a state-wide batching program will be implemented, resulting in a significant cost-saving measure for the System. The purchasing power of multiple items versus single items by each airport individually would allow the State to create a competitive environment with vendors for more favorable pricing. In addition, it would also save on administrative costs and resources for each individual airport. There are a few different approaches the State can take, whether it be through direct MaineDOT procurement, or the ACIP programing to align multiple equipment purchases for airports in similar years into a single procurement. This bulk procurement effort can coincide with economy of scale through a regional approach to procurement.



### 6.2.3 STATE BLOCK GRANT PROGRAM

An analysis was performed of the advantages and disadvantages of MaineDOT embarking on a State Block Grant Program (SBGP). MaineDOT will continue to assess the feasibility of the program. While implementing an SBGP in Maine has its benefits, the feasibility of the program should be evaluated with consideration of administrative expenses and personnel associated with the operation of such a program. More details on the advantages and disadvantages can be found in **Chapter 2 State-Wide Costs**.

As established in Phase I and Phase II, funding is a critical challenge across the System with ineligible AIP projects, low-competing/high-cost projects, diminished purchasing power of AIP entitlements, and various other financial considerations for each airport and its community needs. If funding was available, the estimated \$800,000, in 2022 dollars, for the administration of SBGP could be allocated towards a solution that addresses the funding gaps across the System and generate a more direct and appropriate impact on the System.

While the current fiscal environment presents challenges, the potential benefits of the SBGP warrant continued consideration. MaineDOT will further assess how the SBGP might align with the State's goals and priorities. As funding needs evolve, SBGP may offer a viable pathway to address funding gaps and support the long-term sustainability of the System.

### 6.3 RIGHT-SIZING FACILITIES AND INFRASTRUCTURE NEEDS ACROSS THE STATE

The endeavor to appropriately scale facilities and infrastructure needs is a critical component for the State in alleviating future funding challenges. MaineDOT will consider the rightsizing of facilities and infrastructure when determining the appropriate funding efforts for airport projects, which may involve keeping facilities and infrastructure as is, expanding, downsizing, alternative uses, or letting assets reach their useful life with no remediation. The right-sizing approach to projects influences not only the initial capital requirements but also the long-term financial obligations related to maintenance, rehabilitation and potential reconstruction costs incurred by the airport and the System.

MaineDOT will utilize policies from **Chapter 4 Performance Metrics and Standards** and **Chapter 5 State Priority Guidance for Competitive Projects** of the SASP to facilitate future infrastructure funding decisions. The data and information gathered for SASP Parts I and II is essential to providing guidance and direction for right-sizing System facilities through 2045.

## 6.4 STRATEGIC SOLUTIONS : MAINTENANCE CHALLENGES

One of the top priorities identified in Phase I were the maintenance challenges faced by airport sponsors. Specifically in regard to snow and ice control, airfield lighting and visual aids, pavement repairs, and vegetative and obstruction management. Below is a list of state-wide initiatives to address these maintenance challenges:

- Pre-Qualified Airfield Electrical Technicians
- Development of an Airport Managers' Guidance and Training Program
- MaineDOT Airport Inspection Program

### 6.4.1 PRE-QUALIFIED AIRFIELD ELECTRICAL TECHNICIANS

Airfield lighting maintenance requires specialized training for electrical technicians. For effective and proper maintenance and execution of airfield lighting projects, sponsors must have access to qualified airfield lighting technicians. Due to the locations of airports, it can be difficult for some sponsors to acquire the technical support required. MaineDOT will procure a master list of pre-qualified airfield lighting technicians and inform airport sponsors of the availability of technicians.

### 6.4.2 AIRPORT MANAGER'S GUIDANCE AND TRAINING PROGRAM

Phase I recommended the establishment of training program for airport managers. Each airport faces unique maintenance challenges, but there are industry's best practices which can be shared to assist sponsors in running efficient and fiscally effective maintenance programs. As the nucleus of the state-wide system, airports look to MaineDOT for guidance on best maintenance practices. Accordingly, MaineDOT will develop a database of best maintenance practices for effective airport management. These practices will be shared online and through arranged training forums. The following topics are an example of those to be covered in the Airport Managers' training program :

- Aviation Safety Management Systems
- AIP Program Overview and Updates
- Grant Management and Project Planning
- Consultant Selection Process
- GARD Operation
- Hangar Management Practices
- Snow And Ice Control Techniques and Methodologies
- Vegetation and Obstruction Management
- Airfield Lighting and NAVAID Maintenance and Operation
- Equipment Maintenance

- Pavement Condition Monitoring and Maintenance
- Fueling System Equipment Monitoring and Maintenance
- Airport Solar Farms

Additional topics and best practice policies for Airport Management training will be shared in a continuously evolving forum, with guidance published and stored online. The forum will include interaction and sharing of training materials from Subject Matter Experts (SME's) and other aviation organizations. The training will be continuously updated to reflect best practices based on current technology and assets available to Maine State airports.

### 6.4.3 MAINEDOT AIRPORT INSPECTIONS

Every public use airport in the State system is subject to a federally mandated inspection on a periodic cycle. For Part 135 Commercial Airports such inspections are managed by the FAA. MaineDOT schedules and oversees the inspection process for all non-commercial service public airports. The following areas are addressed and documented as part of the inspection process:

- General Facilities Condition and Maintenance
- Pavement Maintenance Plan and Airfield Marking
- Fuel Systems Maintenance and Condition
- Maintenance and Repair of Airfield Visual Aids and Airfield Lighting
- Maintenance and Repair of SRE equipment and SRE facilities
- Clear Approaches, Obstruction Removal, and Vegetative Management

MaineDOT maintains a record for all public airport inspections. Additionally, MaineDOT tracks infractions for correction and provides assistance and guidance on implementation of required corrective action. MaineDOT is committed to maintaining safety as the top priority for all State system airports.

### 6.5 STRATEGIC SOLUTIONS : EDUCATION, COLLABORATION AND WORK FORCE DEVELOPMENT

Educating and collaborating with the local community to increase activity at local airports are key goals of the SASP. The importance of enhancing a community's understanding of the benefits and value provided by a public airport significantly affects revenue generation at the airport. Indeed, local community support is vital to the "right-sizing" of an airport. The SASP conducted an economic impact analysis of all System airports. The results provide a keen insight into the economic stimulus and workforce development capabilities community airports provide. (See **Attachment 1 and Attachment 2** for a full version of the *Maine State Aviation System Plan Economic Impact Analysis and Case Studies* and *State-Wide Economic Impacts of Aviation by Airport* for all the 35 airports within the System).

Additionally, the SASP conducted case studies of four aviation entities unique to the state of Maine:

- LifeFlight of Maine
- Maine's Seaplane Industry
- Regional Air Service Provided by Penobscot Island Air
- Agricultural Support Provided by Deblois Flight Strip (43B)

### 6.5.1 COMMUNICATION AND COLLABORATION WITH LOCAL COMMUNITIES

MaineDOT encourages system airports to foster a culture of effective communication with the public, partnering with sponsors to open airports to their local communities. Airshows, Fly-Ins and Car Shows, Summer Camps, and Drone Rodeos, are just a few of the creative ideas State Airports have utilized to encourage local community involvement.

Public support is critical for the success of an airport and the future of aviation. The SASP is written to demonstrate to the public the importance of maintaining and funding projects that keep our airport system viable. The goal is to show how aviation benefits the community outside the gates of the airport. Sharing the economic impact data collected as part of the SASP with town managers and local councils is strongly encouraged. (See **Attachment 1 and Attachment 2** for a full version of the *Maine State Aviation System Plan Economic Impact Analysis and Case Studies* and *State-Wide Economic Impacts of Aviation by Airport* for all the 35 airports within the System).

### 6.5.2 WORKFORCE DEVELOPMENT

MaineDOT supports efforts to promote Science, Technology, Engineering, and Mathematics (STEM) learning opportunities at airports. These activities are vital to the development of a locally grown aviation workforce. Opportunities to promote youth involvement in aviation programs are recognized as a proactive, best practice for State aviation. Airports are encouraged to provide access to local schools, flight clubs, college and university programs, and recognized organizations that work to grow interest in aviation.

### 6.6 MAINE DOT'S AVIATION GRANT MANAGEMENT PROGRAM - CAPLAN

One of the Phase I recommendations was to develop and implement a state-wide management tool for MaineDOT and airport sponsors into a single online, user-friendly platform to manage the ACIP program across the System. This has been done. A database platform known as CAPLAN (for Capital Asset Planning) was designed and implemented to track the state-wide ACIP program. The program provides sponsors and MaineDOT the ability to interact on all phases of the ACIP program, from initial sponsor proposal of a project, to approval and verification processes, and

provides tracking of funding allocations. Additionally, CAPLAN tracks key milestones for project grant funding and project life cycle.

MaineDOT will use CAPLAN as a comprehensive overview for tracking airport projects, associated costs and funding, and approval status. This program serves as an effective and efficient communication tool fostering collaboration among MaineDOT, airport sponsors and staff, and consultants for supporting current and future CIP requests. CAPLAN ensures all parties are well-prepared and informed on current and future CIP projects

## 6.7 EMERGING TECHNOLOGIES

The Maine State Aviation System has a strategic and well-established transportation network and infrastructure, positioned to embrace emerging technologies in the aviation industry. The advancement of developments in aircraft materials, guidance systems and fuel sources, offer huge opportunities for a new age of aviation. Advanced Air Mobility (AAM), Unmanned Aircraft Systems (UAS), electrification of airports, developments in lighter-than-air aircraft, all represent some of the exciting developments and opportunities that will improve access to aviation for more members of society, and boost the role of aviation as a means of transportation. AAM presents the capability to move cargo and people on a regional scale, while accessing rural areas and remote island communities in Maine.

MaineDOT will study how to best prepare for these new developments and how to utilize our existing infrastructure to adapt for the changes in technology. Adopting to meet the opportunities provided by emerging technology is a goal set by the SASP to identify opportunities for nurturing key system components and pursuing emerging technologies, which propel the System into the future and unlock new avenues for innovation and growth. Not only do these emerging technologies bring economic opportunities, but they also have the potential to enhance critical community functions by opening new routes of connectivity.

MaineDOT is working to ensure the safe adoption of UAS vehicles in State airspace.

MaineDOT has outlined a roadmap for the UAS program which includes the following:

- Better integration and regulation between agencies and industry
- Interaction with state and federal legislatures to implement laws that support the new airspace requirements
- Prepare and embrace emerging technology with existing infrastructure
- Build a skilled workforce pipeline that supports aviation's future

MaineDOT will continue to explore and identify opportunities in emerging technologies through a SASP AAM specific study. The study will examine AAM's impact on the State of Maine to include use cases, societal benefits, passenger and cargo demand, the economic principles of UAS

drones, costs, revenues and economic impact through 2050, thus reinforcing the aviation system as an integral role of the State’s multi-modal transportation network.

**6.8 DEVELOPMENT OF LORING INTERNATIONAL AIRPORT IN SUPPORT OF MAINE’S AEROSPACE INDUSTRY**

Loring International Airport, formally Loring Air Force Base, was established in 1947. The Airfield was designated in 1997 as a private airfield and encompasses Maine’s longest runway of 12,100 ft and includes 3,800 acres of land with a 1,600-acre aviation complex known as Loring Commerce Center operated by the Loring Development Authority (LDA).

In order for the airport to support any significant level of aviation activity, the airfield will likely require significant upgrades. According to the Economic Development Strategic Plan, developed by RKG Associates, Inc. in November 2019, key areas of consideration will include runway repairs, apron and taxiway repairs, lighting upgrades, and landing systems.

With funding support from the federal government (Department of Defense), the LDA, is in the process of developing an Airport Master Plan to petition the Federal Aviation Administration (FAA) for acceptance of the Loring International Airport into the National Plan of Integrated Airport Systems (NPIAS). The project is expected to be completed in Spring 2025.

The public use designation of the Loring International Airport can bode significant future economic and job creation opportunities for the central Aroostook region and the State through emerging technologies in the aerospace sector. A NPIAS designation will allow the LDA to access significant long-term funding through the FAA Airport Improvement Program (AIP). However, this would result in a greater financial obligation from MaineDOT to participate in making critical improvements to the airport and its facilities (hangars); to facilitate strategic plans for aviation uses; and to prepare the property for future aerospace and spaceport operations.

The State of Maine is making significant efforts to invest and establish itself in the industry and in April 2022 established the Maine Space Corporation. Loring Commerce Center along with Brunswick Landing are intended to serve as bases for Unmanned Aerial Systems (UAS), Advanced Air Mobility (AAM), Research and Development (R&D), and horizontal launch operations for the Maine Space Corporation. A public-private investment model will be utilized for all future development at the airport.

Loring International Airport achieving inclusion in the NPIAS as a public-use airport would not only foster the growth of Maine’s aerospace industry but also position the state as a prominent aviation asset within the FAA Office of Spaceports. By preparing the property for the future, Loring would be able to attract private investment into the region due to the growing market

opportunities of the aerospace industry which is estimated to grow to approximately \$1.8 Trillion by 2035.<sup>1</sup>

In pursuit of MaineDOT's goals of incorporating emerging technology and capturing opportunities within the System, Loring International Airport (ME16) is an example of an airport that is prime for establishing a new industry within the State of Maine resulting in job opportunities for a remote and economically distressed region of the State. The MaineDOT Long-Range goals identified in the Family of Plans align with the support of Loring to increase global connectivity to Maine; contribute to the economic opportunities for people, communities, and businesses; and establish Maine as a leader in the aerospace industry.

MaineDOT supports the redevelopment of Loring and its integration into the NPIAS. The **Chapter 4 Performance Metrics and Standards** outlined in this document will serve as guidance for the development and restoration of the airport and its reemergence as a major asset to the State of Maine.

## 6.9 CONCLUSION

MaineDOT, the Project Advisory Committee, Maine State Airport Managers, our FAA colleagues, State aviation system stakeholders, and project consultant McFarland-Johnson - have all committed significant investment in time, financial resources, and professional knowledge in contributing their efforts and resources to preparing this document. Their dedication and commitment are greatly appreciated and respected.

The State of Maine has a tremendous asset in its aviation infrastructure. The recommendations made by the many people involved in this report will benefit the State for decades to come. The work done in this report will prepare the State's airports, workforce, and entire aviation industry to be better maintained and operated for several more decades. Indeed, the aviation industry is preparing for a major revolution in emerging technology – changes in aircraft design, materials, energy sources, and guidance systems are happening right now. Airport terminals are being designed with multi-modal functionality and resiliency that was unimaginable a short time ago. It is critical for the State to start preparing today for the coming changes in order to utilize our aviation infrastructure to benefit the people of the State of Maine. There are several challenges facing airports and the industry – but through preparation, planning and the recommendations outlined in this System Plan, our aviation system will be prepared to meet these challenges and provide the State with a safer, more economical, climate friendly, sustainably powered aviation

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<sup>1</sup> Space: The 1.8 Trillion Opportunity for Global Economic Growth. 8 April 2024. Accessed 13 June 2024. [Space: The \\$1.8 trillion opportunity for global economic growth | McKinsey.](#)

system that is capable of providing equitable access to our aviation system to a greater number of our citizens than ever before.

MaineDOT will need to continue to evaluate its standards and funding sources as they evolve over time. Achieving the optimal performance envisioned in the system plan will require sustained commitment of additional funding, time, and staffing resources. MaineDOT is dedicated to the active implementation of this plan, ensuring its relevance, and safeguarding against obsolescence.

Fly safe!

Alan D. Lambert

Director of Aviation

Maine Department of Transportation



# Appendix A: State-Wide Costs

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## MEMORANDUM

**TO:** Maine Department of Transportation  
**FROM:** McFarland Johnson, Inc.  
**DATE:** October 28, 2022  
**SUBJECT:** Magnitude of Costs  
**PROJECT NO.:** MaineDOT WIN# 018717.03; MJ#19008.00

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### Introduction

The purpose of this memorandum is to document the methodology and provide guidelines for estimating the cost of new/reconstruction projects at airports.

### Background Information

MaineDOT provided a detailed summary of the history of grants issued through the Federal Aviation Administration (FAA) Airport Improvement Program (AIP). This list was reviewed to select representative projects for the following types of infrastructure:

- Runways, Taxiways, Aprons
- Fuel Farms
- Snow Removal Equipment (SRE) and Aircraft Rescue and Fire Fighting (ARFF) Equipment
- Hangars, SRE Buildings, and ARFF Buildings
- Terminal Buildings

Automated Weather Observing System (AWOS) project costs are being developed under a separate, targeted study with MaineDOT.

Although the summary of grants listed airport projects as far back as the 1990s, only projects listed in 2016 or later were utilized in this evaluation as it was assumed that this timeframe best resembles today's economy and regulatory processes. Note that if a project was not present in this timeframe, the search was expanded to as early as 2013.

Projects were analyzed on a per-square-foot basis. Approximate dimensions were obtained from the grant project description, published FAA data, or Google mapping.

Project costs were escalated to present dollar value (2022) based upon published cumulative inflation rates per a specific year as described by the U.S. Bureau of Labor Statistics and in **Table A-1** below.

**Table A-1: Inflation Rates in the United States Adjusted to 2022 Dollars**

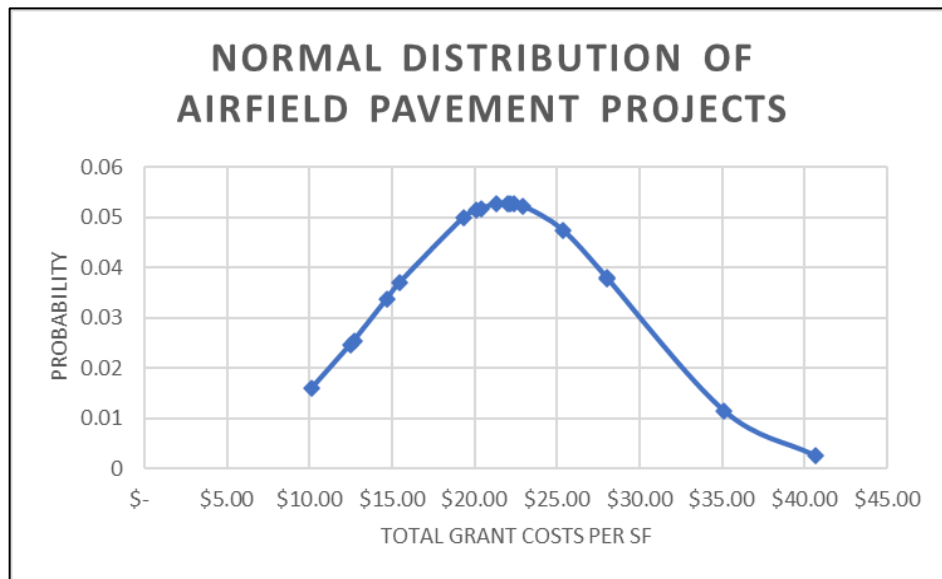
Year	Cumulative Rate of Inflation in 2022 (%)
2013	22.09
2014	20.19
2015	20.30
2016	18.67
2017	15.78
2018	13.43
2019	11.69
2020	8.98
2021	7.48

Source: [https://www.bls.gov/data/inflation\\_calculator.htm](https://www.bls.gov/data/inflation_calculator.htm)

### Runways, Taxiways, and Aprons

The initial review of airfield pavement projects divided the analysis into three categories based on pavement use: runways, taxiways, and aprons. The initial hypothesis and reason for breaking into separate analyses was that one type of project may cost substantially more than the other due to complexity or incidental work elements. However, it was found that the average costs per square foot were comparable across all categories and that the analysis would benefit from a larger sample size. Thus, the projects were combined and normalized as illustrated in **Figure A-2** below.

**Figure A-2: Normal Distribution of Airfield Pavement Projects**



Source: McFarland Johnson, Inc analysis, 2022.

An analysis of the historical project costs for the runway, taxiway, and apron was performed and escalated using 2022 dollars to garner the project cost/SF illustrated in **Table A-3** below.

**Table A-3: Historical Runway, Taxiway, and Apron Pavement Project Costs**

Runway, Taxiway and Apron Pavement Projects							
Airport	Identifier	Year	Project	Project Size (SF)	Original Project Cost (\$)	Escalated Project Cost (2022)	Project Cost/SF
Eastern Slope	IZG	2016	Reconstruct a portion of Terminal Apron (approx. 7,800 s.y.); and remark existing Runway	70,200	\$ 741,000.00	\$ 879,344.70	\$ 12.53
Rockland	RKD	2019	Rehabilitate Apron - Phase 1 (approx. 9,100 SY)	81,900	\$ 1,075,000.00	\$ 1,200,667.50	\$ 14.66
Augusta	AUG	2022	Reconstruct Commercial Apron (5080sy)	45,720	\$ 707,676.00	\$ 707,676.00	\$ 15.48
Stephen A. Bean	8B0	2017	Reconstruct and Expand Apron (approximately 3,000 square yards)	27,000	\$ 591,111.00	\$ 684,388.32	\$ 25.35
Northern Aroostook	FVE	2020	Reconstruct Main Apron (approx. 9,833 SY)	88,497	\$ 3,300,000.00	\$ 3,596,340.00	\$ 40.64
Sanford	SFM	2021	Reconstruct TW C, including drainage	93,800	\$ 1,779,003.00	\$ 1,912,072.42	\$ 20.38
Waterville	WVL	2021	Reconstruct TW A; Replace Airfield Lighting Vault	224,500	\$ 4,635,300.00	\$ 4,982,020.44	\$ 22.19
Augusta	AUG	2021	Reconstruct parts of Taxiway C and E	111,311	\$ 2,376,698.00	\$ 2,554,475.01	\$ 22.95
Greenville	3B1	2016	Construct Taxiway "B" (approx. 4,000' x 35')	140,000	\$ 3,307,000.00	\$ 3,924,416.90	\$ 28.03
Caribou	CAR	2016	Construct Taxilane (approx. 460' x 25')	11,500	\$ 340,000.00	\$ 403,478.00	\$ 35.09
Auburn	LEW	2019	Rehabilitate Runway 4-22 and Improve Runway 4-22 Safety Areas	500,100	\$ 4,543,291.11	\$ 5,074,401.84	\$ 10.15
Wiscasset	IWI	2021	Recon RW 7/25 Phase 1 & 2 RSA	254,775	\$ 3,010,704.00	\$ 3,235,904.66	\$ 12.70
Auburn	LEW	2019	Reconstruct Runway 17-35; and Realign/Construct Taxiways "B" and "J"	206,250	\$ 3,569,728.89	\$ 3,987,030.20	\$ 19.33
Eastport	EPM	2020	Reconstruct, Mark, and Light Runway 15-33	315,000	\$ 5,806,900.00	\$ 6,328,359.62	\$ 20.09
Princeton	PNN	2017	Reconstruct Runway 15-33 (approximately 4,005' x 75')	300,525	\$ 5,532,152.22	\$ 6,405,125.84	\$ 21.31
Lincoln	LRG	2020	Shift & Reconstruct Runway 17-35; Construct Runway Safety Areas; Remove Obstructions for Runway 35 Approach; and Install NAVAIDS (Segmented Circle and Lighted Wind Cone)	168,240	\$ 3,400,650.00	\$ 3,706,028.37	\$ 22.03
Machias	MVM	2018	Reconstruct Runway 18-36 and Relocation of Runway 36 Approach Utility	172,800	\$ 3,414,000.00	\$ 3,872,500.20	\$ 22.41
Biddeford	B19	2020	Reconstruct Runway 6-24 and Runway 24 Obstruction Removal	225,000	\$ 5,783,470.00	\$ 6,302,825.61	\$ 28.01
	Runway		One Standard Deviation Below	\$ 14.29		Average (\$/SF)	\$ 21.85
	Taxiway		Average (\$/SF)	\$ 21.85		Median (\$/SF)	\$ 21.67
	Apron		One Standard Deviation Above	\$ 29.42		Standard Deviation (\$/SF)	\$ 7.56

Source: McFarland Johnson, Inc, analysis, 2022.

It was noted that the most expensive projects were located in the northern and most remote regions of the state. These regions experience deeper frost penetration which results in a deeper pavement box and higher excavation and gravel costs. Additionally, hauling and transportation costs are generally higher in remote areas. Based on anecdotal evidence, the less expensive project at Auburn was a mill and overlay, and Eastern Slope Regional was a partial depth reclaim project and did not include additional project elements such as electrical and drainage infrastructure. These projects were included because they represent actual, real-life examples and they normalize the data. Therefore, an approximate range of \$15-\$30 per square foot is appropriate for reconstruction. It is recommended that projects are estimated using the average of approximately \$22 per square foot unless specific project parameters and geographic location would suggest otherwise.

### Fuel Farm Projects

There is no ideal way to compare fuel farms. The logical per-unit basis is to compare volumetric size based on gallons of storage. Unfortunately, recent quotes and bid results conducted at Belfast Municipal Airport identified that the tank size does not have a large impact on the overall cost. A 2021 bid with a deductive alternate in which a 12,000-gallon tank would be reduced to a 10,000-gallon tank resulted in a proposed credit of only \$2,855.00 for the tank size reduction. The proposed credit was less than one percent (<1%) of the total project cost of \$995,493.00. **Table A-4** below outlines the historical fuel farm project costs.

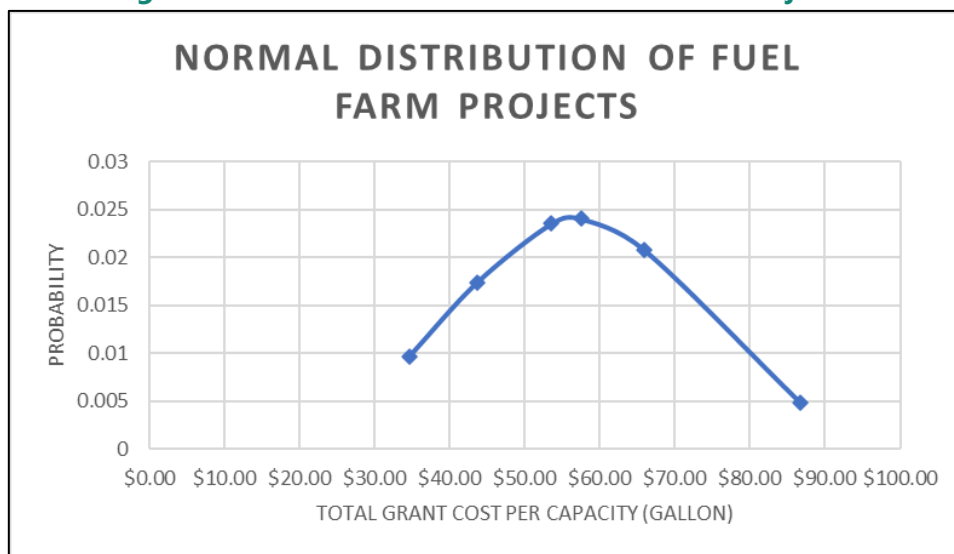
**Table A-4: Historical Fuel Farm Project Costs**

Fuel Farm Projects							
Airport	Identifier	Year	Project	Project Size (GAL)	Original Project Cost (\$)	Escalated Project Cost (2022)	Project Cost/gal
Northern Aroostook	FVE	2016	Construct 12,000 gallon Jet "A" fuel facility	12,000	\$ 350,000.00	\$415,345.00	\$34.61
Sugarloaf Int.	B21	2016	Construct 12,000 gallon fuel farm facility (100LL/MOGAS)	12,000	\$ 441,300.00	\$523,690.71	\$43.64
Belfast	BST	2021	Construct Fuel Farm (2-10,000 gallons) AvGas & Jet A	20,000	\$ 995,493.00	\$1,069,955.88	\$53.50
Greenville	3B1	2018	Construct Fuel Farm - Single Split Tank (12,000 gallon; 100LL/Jet "A")	12,000	\$ 608,000.00	\$689,654.40	\$57.47
		2021	Example 8000 gal Tank	8,000	\$ 490,916.00	\$527,636.52	\$65.95
Machias	MVM	2021	Construct Fuel Farm	6,000	\$ 484,085.00	\$520,294.56	\$86.72
			12,000 Gal System	One Standard Deviation Below	\$ 40.37	Average (\$/SF)	\$56.98
			10,000 Gal System	Average (\$/SF)	\$56.98	Median (\$/SF)	\$55.48
			8,000 Gal System	One Standard Deviation Above	\$ 73.59	Standard Deviation (\$/SF)	\$ 16.61
			6,000 Gal System				

Source: McFarland Johnson, Inc Analysis, 2022

Nonetheless, this unit price demonstrates a useful method to estimate the array of fuel tank sizes. Because of the small sample size, an example project was created to represent an 8,000-gallon tank with costs modeled based on the average of the recent bid results from Machias and Belfast. The fuel farm projects were combined and normalized as illustrated in **Figure A-5** below.

**Figure A-5: Normal Distribution of Fuel Farm Projects**



Source: McFarland Johnson, Inc Analysis, 2022.

It was noted that fuel systems in 2016 were significantly less expensive than in recent years. This may be a result of the tariffs imposed on steel during the Trump Administration which started in 2018. A combination of the tariffs and the complexity of a split tank system is likely to contribute to the higher Greenville fuel system costs. Although the cost of Machias was less expensive, the cost per tank volume was the most significant. Therefore, an approximate range of \$40-\$74 per gallon is appropriate for fueling systems. It is recommended that projects are estimated using the average of approximately \$57 per gallon unless specific project parameters and geographic location would suggest otherwise.

## Equipment Purchases

### Snow Removal Equipment Purchases

A review of the snow removal equipment identified how many variations in types of equipment and costs are available to the sponsor. An example of this variation is evident in the difference between bids received by Millinocket and Augusta in 2019. Both projects included the purchase of carrier vehicles, plows, and a second attachment (rotary plow vs. spreader), and because of this, the bids varied by nearly 200 percent. Recently, vendors have provided quotes of nearly \$950,000 for a carrier vehicle, rotary plow, and broom, exclusive of procurement and grant costs. Considering the recent energy spikes and supply chain issues, the MaineDOT should anticipate equipment purchases to become more expensive than seen historically. A cost of \$750,000-\$950,000 is anticipated, however, project specifics must be considered during the budget planning process.

### Aircraft Rescue and Fire Fighting (ARFF) Equipment

The number of ARFF vehicles, size, minimum requirements for foam discharge capacity and agent discharge capacity, are governed by the Airport's index as defined by Title 14 CFR Part 139.315, *Aircraft Rescue and Firefighting: Index Determination* and Title 14 CFR Part 139.317, *Aircraft Rescue and Firefighting: Equipment and Agents*. Recently, vendors have provided prices of between \$850,000 and \$900,000. An assumed cost of \$850,000-\$1,000,000 is recommended, however, project specifics must be considered during the budget planning process.

## Hangar and SRE Building Projects

Hangars, SRE Buildings, and ARFF Buildings tend to share characteristics in that their main objective is vehicle storage. All can be enhanced with features and finishes that increase their project costs. It was found that there is a distinct cost differential between T-hangar development and Box Hangar development. This is reasonable because T-hangars are typically basic in nature, with minimal finishes, and tend to be smaller in height and width which decreases structural member sizing and foundation requirements. Additionally, the footprint and use of T-hangars require lower fire protection standards.

### T-Hangers

There is minimal grant information available on T-hangars. Of the available information, some projects were phased over several fiscal years which would increase the project costs for grant administration. Multi-year phasing may have been partly responsible for the high costs associated with the hangar construction at Pittsfield Municipal Airport as illustrated in **Table A-6** below. Although not specifically stated, it is assumed that a taxilane was constructed as part of the T-hangar project at Dewitt Field-Old Town Municipal Airport in 2019. Aerial imagery confirmed the construction of a taxilane as part of the T-hangar project at Caribou Municipal Airport in 2017. The T-hangar sizes for the projects at Caribou Municipal Airport and Dewitt Field were assumed to be the same as the T-hangar constructed at Pittsfield Municipal Airport. The 2018 steel tariffs likely played a role in the increase in costs between 2017 and 2019.

**Table A-6: Historical Hanger and Snow Removal Equipment Building Projects**

Hangar & Snow Removal Equipment Building Projects								
Airport	Identifier	Year	Project	Project Size (SF)	Original Project Cost (\$)	Escalated Project Cost (2022)	Project Cost/SF	
Caribou	CAR	2017	Construct Building - Construct 6 Bay T-Hangar (150' x 60')	9,000	\$647,358.89	\$749,512.12	\$83.28	
Dewitt Field	OLD	2019	Construct Building - 6-Unit T-Hangar (Phase 1)	9,000	\$743,204.44	\$830,085.04	\$92.23	
Pittsfield	2B7	2019	Construct 6 Bay Hangar, stormwater control and Taxilanes	9,000	\$1,323,800.70	\$1,478,553.00	\$164.28	
Millinocket	MLT	2017	Construct Snow Removal Equipment Building (2,990 square feet)	2,990	\$735,121.11	\$851,123.22	\$284.66	
Brunswick	BXM	2018	Construct Building - Hangar (15,867 square feet)	15,867	\$4,040,889.00	\$4,583,580.39	\$288.88	
Fryeburg	IZG	2020	Construct New Transient hangar (102x103)	10,506	\$2,868,937.71	\$3,126,568.32	\$297.60	
Brunswick	BXM	2014	Construct Snow Removal Equipment Building [construction]	6,750	\$1,690,300.00	\$2,031,571.57	\$300.97	
	T-Hangars		One Standard Deviation Below	\$	77.00	Average (\$/SF)	\$	113.26
	Box Hangar & SRE		Average (\$/SF)	\$	113.26	Median (\$/SF)	\$	92.23
			One Standard Deviation Above	\$	149.53	Standard Deviation (\$/SF)	\$	36.26
			One Standard Deviation Below	\$	286.48	Average (\$/SF)	\$	293.03
			Average (\$/SF)	\$	293.03	Median (\$/SF)	\$	293.24
			One Standard Deviation Above	\$	299.57	Standard Deviation (\$/SF)	\$	6.54

Source: McFarland Johnson, Inc analysis, 2022.

With such a small sample size, it is recommended that the most recent project cost be carried forward for estimating T-Hangars. Therefore, it is recommended that a cost of approximately \$165 per square foot be used for project estimating purposes.

### Box Hangers and SRE Buildings

Box Hangars and SRE Buildings do not distribute normally but tend to cluster closely from approximately \$284-\$300 per square foot. It is recommended that an assumed cost of approximately \$300 per square foot be used to estimate box hangars, SRE buildings, and ARFF buildings.

### Terminal Building Projects

Terminal buildings are not like SRE buildings or hangars because they tend to have higher-end finishes and greater versatility. An analysis of grant histories for terminal buildings in the State of Maine found commercial service and GA terminals resulted in similar eligible costs.

Because buildings constructed after 2016 best resemble today’s economy, these unit prices should be considered with the most weight. However, in cases such as the construction of terminal buildings at Princeton Municipal Airport and Machias Valley Airport, a smaller building footprint could have contributed to a larger cost per square foot. This could be due to inevitable costs that are automatically assumed with all projects, including those associated with mobilization, project phasing, and grant administration.

After weighing the impact of each of these characteristics, it’s practical to assume a cost more closely aligned with the prices found in recent years. An assumed cost of \$700 - \$900 is recommended for terminal building projects, however, project specifics must be considered during the budget planning process. Building footprint, finishes, and site work can all contribute to variances in unit prices.

Eligibility is also more complicated with terminal projects. Based on site visits conducted during Phase I of the system plan, Rockland would appear to have higher ineligible costs due to the

amount of non-public and revenue-generating facilities. Bethel’s grant value indicates that the project was funded with the maximum available entitlement but may not have been representative of the entire project costs. **Table A-7** below outlines the historical terminal project costs.

**Table A-7: Historical Terminal Projects Costs**

Terminal Projects							
Airport	Identifier	Year	Project	Project Size (SF)	Original Project Cost (\$)	Escalated Project Cost (2022)	Project Cost/SF
Bethel	OB1	2013	Construction of Terminal Building and application of Non-Precision Pavement Markings	1,800	\$666,666.67	\$813,933.34	\$452.19
Rockland	RKD	2010	Terminal Facility Construction	10,000	\$3,839,879.00	\$5,113,182.88	\$511.32
Bar Harbor	BHB	2013	Terminal Building Expansion	5,500	\$3,276,819.89	\$4,000,669.40	\$727.39
Princeton	PNN	2019	Construct Terminal Building (approx. 900 SF); and Install Perimeter Fencing with Gate (approx. 600 LF)	900	\$596,000.00	\$665,672.40	\$739.64
Machias	MVM	2017	Construct Terminal Building (approximately 750 square feet) and Reconstruct Airport Access Road (approximately 1,285' x 15')	750	\$564,998.89	\$654,155.71	\$872.21
	GA Facility		One Standard Deviation Below	\$ 504.85		Average (\$/SF)	\$ 660.55
	Commercial Service		Average (\$/SF)	\$ 660.55		Median (\$/SF)	\$ 727.39
			One Standard Deviation Above	\$ 816.25		Standard Deviation (\$/SF)	\$ 155.70

Source: McFarland Johnson, Inc Analysis, 2022

### Summary

Based upon the analysis above, MaineDOT and sponsors have a documented process for developing high-level estimates for projects throughout the state. This will be useful for early programming and master planning efforts along with securing the proper amount of local match money early in the process. The analysis will also provide MaineDOT with justification for challenging project cost estimates both for overzealous or underfunded proposals. The analysis within this memo would not be valid to challenge the actual engineer’s final design estimates or contractor bid results. Most importantly it is important to understand the historical project data, including the analysis within this memo, should be escalated to the present year based on the U.S. Bureau of Labor Statistics. **Table A-8** below is a summary of the recommended cost ranges for new/reconstructed projects at airports.

**Table A-8: Summary of Anticipated Costs of New/Reconstructed Projects**

Project Type	Cost	Recommended value	Per Unit
Runways, Taxiways, Aprons	\$15 - \$30	\$22	Square Foot
Fuel Farm	\$40 - \$75	\$57	Gallon
Snow Removal Equipment	\$750,000 - \$950,000	-	Each
ARFF Equipment	\$850,000 - \$1,000,000	-	Each
T-Hangars	-	\$165	Square Foot
Box Hangars, SRE Buildings, ARFF Buildings	\$284 - \$300	\$300	Square Foot
Terminal Buildings	\$700 - \$900	-	Square Foot

Source: McFarland Johnson, Inc, analysis, 2022.





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## MEMORANDUM

**TO:** Maine Department of Transportation  
**FROM:** McFarland Johnson, Inc  
**DATE:** April 4, 2023  
**SUBJECT:** State-Wide Crosswind Runway Eligibility and Costs  
**PROJECT NO.:** MaineDOT WIN# 018717.03; MJ# 19008.00

### Introduction

The purpose of the analysis is to determine the necessity of crosswind runways at Maine public-use airports. Wind conditions affect aircraft operations, and when designing or evaluating a runway for an airport master plan, it is important to determine whether a crosswind, or secondary runway, is required to maintain safe conditions and acceptable wind coverage on the airfield through a wind data analysis. The FAA AC 150/5300-13B outlines the primary requirements for the recommendation of a crosswind runway:

- The primary runway provides less than 95 percent wind coverage during all weather conditions.
- The primary runway regular use for the critical aircraft needing crosswind coverage (operations)

For the efforts of this study, there are 15 airports with crosswind runways identified for analysis. The high-level crosswind analysis was conducted through traditional master-planning evaluation efforts but looked solely at the requirements for an A-I and B-I aircraft with allowable crosswind components of 10.5 knots. The results of this analysis are to determine the potential future costs of maintaining the existing runways, review eligibility for FAA AIP funding, and recommend alternative use and purpose. Further analysis of individual runways and their crosswind components is recommended during an airport-specific master planning study.

### State-Wide Wind Analysis

The analysis of the crosswind runways was conducted through the FAA's Airport Data and Information Portal (ADIP), through the use of All Weather wind speed data provided, and the wind analysis/wind rose generator. The analysis at each airport looked at the 10.5 crosswind component coverage for the primary runway to determine if the primary meets the FAA's 95% wind coverage requirement. Wind coverage is the percentage of time crosswind components that are within an

acceptable velocity. According to AC 150/5300-13B Appendix B, the FAA has determined that the desirable wind coverage for an airport is 95% as measured across the total number of weather observations recorded during the last ten consecutive years. If a primary runway orientation provides less than 95% wind coverage, then a need for a crosswind evaluation is recommended. Airports, whose primary runway did not meet the FAA’s 95% crosswind requirement for A-I and B-I aircraft are detailed in **Table A-1** below.

**Table A-1 Primary Runway Crosswind Coverage Less Than 95%**

Airport	Primary Runway	10.5 Knot Crosswind Coverage
Auburn Lewiston Municipal (LEW)	04-22	94.31%
Houlton International (HUL)	05-23	93.96%
Knox County Regional (RKD)	13-31	92.98%
Presque Isle International (PQI)	01-19	93.69%
Portland International Jetport (PWM)	11-29	90.91%
Sanford Seacoast Regional (SFM)	07-25	94.83%

Source: McFarland Johnson, Inc analysis, 2023.

The high-level wind analysis determined that six (6) of the 15 airports with crosswind runways met or fell below the FAA’s 95 percent coverage requirement through their primary runway. It should be noted that two (2) airports were identified as having only slightly met the 95 percent crosswind coverage: Caribou Municipal Airport (CAR) and Waterville-Robert Laflour (WVL), see **Table A-2**. Further analysis is recommended on a master planning level study for these identified airports. The All-Weather wind data is a compilation and summary of the latest ten years of wind observations by hours from the weather station associated with each airport. As this information is a summary, total wind coverage can fluctuate and change as more information is gathered or depending on how information is compiled and then summarized. Additionally, the All-Weather wind data can be analyzed further on a master planning level which includes the identification of wind data during airport operational hours rather than all wind data for the 24-hour day period. The following airports’ primary runways meet the 95 percent crosswind runway requirements.

**Table A-2: Primary Runway Crosswind Coverage Greater than 95%**

Airport	Primary Runway	10.5 Knot Crosswind Coverage
Augusta State (AUG)	17-35	96.82%
Caribou Municipal (CAR)	01-19	95.07%
Hancock Country-Bar Harbor (BHB)	04-22	96.96%
Millinocket Municipal (MLT)	11-29	97.08%
Waterville-Robert Laflour (WVL)	05-23	95.02%

Source: McFarland Johnson, Inc analysis, 2023

In addition to the five (5) airports that were identified in **Table A-2**, that exceed the 95% crosswind coverage requirement, the following airports do not have sufficient wind data available from a weather recording station located on the airfield. It is recommended that the State continue to

implement AWOS equipment at airports throughout the state. The airports without wind data are detailed below:

- Greenville Municipal (3B1)
- Dexter Regional (1B0)
- Dewitt Field/ Old Town Municipal (OLD)
- Central Maine Regional/Norridgewock (OWK)

As the aforementioned airports do not have weather recording stations at the airport, a composite wind data set was developed using wind information obtained from two or more nearby recording stations, as recommended by the FAA in AC 150/5300-13B Appendix B. **Table A-3** below provides a breakdown of wind coverage developed using the composite wind data at nearby airports, included in the data is an approximate distance in nautical miles from the analyzed airport to the nearby airports whose wind data was used.

**Table A-3: Primary Runway Crosswind Airports with No Weather Recording Stations**

Airport	Primary Runway	Nearby Airport Wind Data	Composite Wind Coverage
Central Maine Regional (OWK)	15-33	BGR (44 nm); WVL (13 nm); 8B0 (37 nm)	95.77%
Dexter Regional (1B0)	16-34	BGR (20 nm); WVL (33 nm)	95.34%
Dewitt Field - Old Town Municipal (OLD)	12-30	BGR (10 nm); MLT (42 nm)	92.37%
Greenville Municipal (3B1)	14-32	MLT (37 nm); BGR (49 nm)	90.22%

Source: McFarland Johnson, Inc analysis, 2023.

## Operations Analysis

In addition to wind coverage, a crosswind runway evaluation also includes operational requirements. In order to justify a crosswind runway operationally, the crosswind runway must demonstrate regular use of 500 annual operations during crosswind conditions. This is approximated by identifying the percentage of time when A-I and B-I aircraft would not be able to operate on a primary runway and applying that percentage to the annual count.

Based on the forecasting analysis in the Maine State Aviation System Plan - Phase I, which looked at the FAA’s Traffic Flow Management System Counts (TFMSC) and General Audio Recording Device (GARD) operations data, a determination of crosswind requirement was identified. TFMSC data is obtained from source data that is created when pilots file flight plans and/or when flights are detected by the National Airspace System (NAS), usually via RADAR. It should be noted that most Visual Flight Rule (VFR) and some non-enroute Instrument Flight Rule (IFR) traffic are excluded. This is particularly important when analyzing operations at general aviation airports as a substantial portion of A-I/B-I operations are generally VFR traffic and therefore not accounted for in the TFMSC operational counts. To account for the missing VFR operations, GARD data was used to find the gaps in total operations. The GARD system is a private-party technology solution

that is an audio recording system that captures radio transmissions in the vicinity of the airport. A ratio of operations was developed using the two data sources and generalized by asset role. The TFMSC/GARD ratios were applied for Basic, Local, and Regional airports. Using this methodology, the forecast established a baseline level of annual operations for every airport based upon available GARD system data and assumed that the System airports within each asset role category exhibit similar characteristics of scale and user base that drive activity levels.

Using the methodology laid out in Phase I, the analysis of the crosswind data for A-I and B-I can be identified through the gap in VFR operations between the TFMSC and the GARD data as it can be assumed that the gap is overwhelmingly represented by A-I/B-I aircraft. Using this methodology, the IFR operations identified through TFMSC were subtracted from the total GARD data operations to determine the A-I and B-I operations. **Table A-4** below provides the details of the TFMSC to GARD operations breakdown, the TFMSC/GARD ratio, overall operational counts identified in Phase I of the State Aviation System Plan (SASP), estimated A-I/B-I aircraft operations and also depicts the operations counts for the percentage of time when the primary runway does not provide 10.5 knot coverage for A-I/B-I aircraft.

**Table A-4: Airport A-I and B-I Operational Counts**

Airport	Asset Role	TFMSC-19	GARD	TFMSC/GARD	SASP %	SASP Operations	A-I & B-I	A-I & B-I Crosswind Coverage
Auburn Lewiston Municipal (LEW)	Regional	2,761			12.00%	23,008	20,247	1,152
Augusta State (AUG)	Regional	3,730	21,998	16.96%	16.96%	21,993	18,263	581
Caribou Municipal (CAR)	Basic	185			3.00%	6,167	5,982	295
Central Maine Regional/Norridgewock (OWK)	Local	116	9,932	1.17%	1.17%	9,915	9,799	414
Dewitt Field/Old Town Municipal (OLD)	Local	101			7.50%	7,290	7,189	549
Dexter Regional (1B0)	Local	24			7.50%	7,290	7,266	338
Greenville Municipal (3B1)	Local	268			3.00%	5,360	5,092	498

Airport	Asset Role	TFMSC-19	GARD	TFMSC/GARD	SASP %	SASP Operations	A-I & B-I	A-I & B-I Crosswind Coverage
Hancock Country-Bar Harbor (BHB)	Commercial	6,701	22,178	30.21%	30.21%	22,181	15,480	471
Houlton International (HUL)	Local	195			7.50%	1,950	1755	106
Knox County Regional (RKD)	Commercial	5,751	40,194	14.31%	14.31%	40,189	34,438	2,418
Millinocket Municipal (MLT)	Local	106	2,339	4.53%	4.53%	2,340	2234	65
Portland International Jetport (PWM)*	Commercial					58,182	7,369	672
Presque Isle International (PQI)	Commercial	4,393	9,515	46.17%	46.17%	14,643	10,250	647
Sanford Seacoast Regional (SFM)	Regional	1,647	36,733	4.48%	4.48%	36,739	35,092	1,814
Waterville-Robert LaFleur (WVL)	Local	1,073			7.50%	10,730	9657	481

Source: McFarland Johnson, Inc analysis, 2023

\* Only TFMSC data was used to determine A-I and B-I operations.

The results of the A-I/B-I operational counts determined that eight (8) of the 15 identified airports do not meet the regular use threshold to justify an A-I/B-I crosswind runway. It should be noted that four (4) airports were identified with operations that did not meet the 500-operations threshold: Greenville Airport (3B1), Waterville-Robert (WVL), and Hancock County-Bar Harbor (BHB); but are within 30-operational counts of meeting the threshold. It should be noted that airports with GARD data tend to nearly meet the regular use standard or exceed it, except for Millinocket Municipal Airport (MLT). It is recommended that eligibility requirements based on operations be analyzed on an individual master planning basis with updated operations data to verify whether threshold requirements are or are not met.

The results of this system plan analysis show that the following airports in **Table A-5** would not meet FAA eligibility requirements for crosswind runway funding due to not reaching the required 500 operations threshold or above the required primary runway wind coverage:

**Table A-5: Airports Not Reaching the Required FAA Eligibility Threshold**

Airport	Wind Coverage	Operations	Comments
Augusta State (AUG)	96.82%	581 ops	Not likely justifiable
Caribou Municipal (CAR)	95.07%	295 ops	No specific GARD data
Central Maine Regional (OWK)*	95.77%	414 ops	No specific wind or GARD data
Dexter Regional (1B0) *	95.34%	338 ops	(Turf) no specific wind or GARD data
Greenville Municipal (3B1) *	90.22%	498 ops	No specific wind or GARD data
Hancock County-Bar Harbor (BHB)	96.96%	471 ops	Not likely justifiable
Houlton International (HUL)*	93.96%	106 ops	No specific GARD data
Millinocket Municipal (MLT)	97.08%	65 ops	Not likely justifiable
Waterville-Robert Lafleur (WVL)	95.02%	481 ops	May be justifiable

Source: McFarland Johnson, Inc analysis, 2023

\*Both the weather reporting and operational data are approximate estimates.

The results of the analysis showed that though the airports listed in **Table A-5** don't meet FAA eligibility based on the data available, there are certain airports that might meet FAA eligibility if more data were available. Greenville Municipal (3B1) meets the wind coverage requirements for a crosswind and only falls short of operational requirements by two operations, given the GARD data has inconsistencies and TFMSC data may not include all VFR operations, it is recommended that 3B1 be reconsidered when analyzing crosswind eligibility. Like Greenville Municipal, Houlton International (HUL) meets crosswind eligibility as it does not provide 95 percent wind coverage to A-I/B-I aircraft, but it does not meet the 500-operations threshold eligibility. As the airport does not have specific GARD data and has inconsistent/incomplete TFMSC data, it is also recommended that the airport be considered when determining crosswind eligibility.

Waterville-Robert Lafleur (WVL) just falls short of meeting wind requirements and only exceeds the minimum requirement by 0.02 percent. Daily changes in wind can affect the wind coverage and it is recommended that WVL be considered when analyzing crosswind eligibility when looking at wind coverage. WVL also does not meet the 500 operation requirement, falling short by 19 operations, as mentioned previously, incomplete/inconsistent GARD data and TFMSC data may not be providing full information regarding operations at the Airport and therefore it is recommended that Waterville-Robert Lafleur be considered when analyzing crosswind eligibility. Like Waterville-Robert Lafleur, Dexter Regional (1B0), Caribou Municipal (CAR), and Central Maine Regional (OWK) all surpass the 95 percent crosswind coverage by small margins. Dexter Regional and Central Maine Regional do not have specific wind data from a weather reporting station at

the airports and therefore could potentially meet crosswind eligibility, without the airport-specific data, it is recommended that 1B0 and OWK be considered when analyzing for crosswind eligibility. Caribou Municipal does have a weather reporting system on the field, but similar to Waterville-Robert LaFleur, only exceeds the 95 percent crosswind component by a small percentage of 0.07 percent, with the ever-changing wind conditions, it should be noted that the airport has the potential to meet wind coverage requirements upon further analysis. Additionally, though the airport does not meet the 500-operations requirement threshold, no specific GARD data, and inconsistencies with TFMSC data, Caribou Municipal has the potential to meet operational requirements and is therefore recommended for consideration in crosswind eligibility.

The final three airports identified as not meeting FAA eligibility requirements, Hancock County-Bar Harbor (BHB), Augusta State (AUG), and Millinocket Municipal (MLT) do not meet the crosswind coverage requirements, exceeding the 95 percent as set by FAA, each of these airports have a weather reporting system on the field providing accurate and up-to-date data for wind analysis.

## Life Cycle Cost Analysis

The FAA provides funding for airports with eligible crosswind runways as defined in AC 150/5300-13B. If a crosswind runway does not meet the eligibility requirements, the cost of maintenance of an existing runway then falls to the airport sponsor. The cost of maintaining the non-FAA-eligible crosswinds for the identified crosswind runways was analyzed. The methodology for the runway costs was developed for this analysis to explore the costs associated with rehabilitating the existing asphalt runways. The estimate for the rehabilitation assumed the removal and replacement of approximately four (4) inches of asphalt. It was assumed the asphalt runway would conform to FAA standards, including asphalt mix design, quality assurance requirements, and longitudinal and transverse grading design. Therefore, it was assumed the existing turf would be regraded to the limits of the Runway Safety Area (RSA). Other items, including erosion control best management practices, mobilization, and design and construction administration were also included. The approximate unit price cost for this work is anticipated to be approximately \$12 per square foot. The runway pavement costs were based on actual costs of runway pavement in the State of Maine. More information on the cost analysis is available in **Attachment A**. The pavement replacement costs of the ineligible crosswind runways are detailed in **Table A-6** below and were determined by applying cost per square foot (\$11.34) identified as the life cycle cost estimate, to the total square footage of each of the crosswind runways.

While DeWitt Field/Old Town (OLD) technically fulfills FAA eligibility criteria, the available data are approximate due to the absence of weather reporting stations at OLD and incomplete GARD data. Because both sources of data for FAA eligibility requirements lack completeness, and considering the airport's classification of reported aviation activity, it has a high potential of not being FAA eligible and therefore is included in the life cycle cost analyses.

**Table A-6: Pavement Replacement Costs of Ineligible Airport**

Airport	Crosswind Runway	Length	Width	Total Current Runway (SF)	Pavement Replacement Cost*
Augusta State (AUG)	RWY 08-26	2,613	75	195,975	\$2,222,356.50
Caribou Municipal (CAR)	RWY 11-29	3,017	75	226,275	\$2,565,958.50
Central Maine Regional (OWK)	RWY 13-21	3,998	80	319,840	\$3,626,985.60
Dewitt Field/Old Town Municipal Airport (OLD)	RWY 04-22	2,802	75	210,150	\$2,383,101.00
Dexter Regional (1B0)**	-	-	-	-	-
Greenville Municipal Airport (3B1)	RWY 03-21	3,001	75	225,075	\$2,552,350.50
Hancock County-Bar Harbor (BHB)	RWY 17-35	3,363	75	252,225	\$2,860,231.50
Houlton International Airport (HUL)	RWY 01-19	2,700	60	162,000	\$1,837,080.00
Millinocket Municipal Airport (MLT)	RWY 16-34	4,000	100	400,000	\$4,536,000.00
Waterville-Robert LaFleur Airport (WVL)	RWY 14-32	2,301	60	138,060	\$1,565,600.40
<b>Total</b>					<b>\$ 24,149,664</b>

Source: McFarland Johnson, Inc analysis, 2023.

\*Costs reflect 2022-dollar value

\*\* The airport currently has a turf runway therefore it is not included in the analysis

### Right-Sizing Crosswind Runways

A majority of the airports listed above have a crosswind runway that exceeds the A-I/B-I runway length and width requirements as defined by the FAA in AC 150/5300-13B and AC 150/5325-4B. The high-level analysis of runway length for A-I/B-I aircraft was conducted and utilized a mean maximum temperature of 85 degrees Fahrenheit. The temperature data was sourced from FAA Aviation Safety Detail DOT/FAA/TC-21/43, *Future Climate Scenarios for Runway Length: Assessment of Future Temperature and Precipitation Trends*, published by Annick Dewald and John



Hansman, on November 30, 2021. The analysis also included generalized runway elevations in 500-foot increments. The results showed a recommended runway length:

- 3,000 for elevations from sea level to 500 feet MSL,
- 3,200 feet for 501 to 1,000 feet MSL,
- 3,400 feet for 1,001 to 1,500 feet MSL, and
- 3,600 feet for 1,501 to 2,000 feet MSL.

The standard runway width recommended for A-I/B-I small aircraft is 60 feet wide, according to AC 150/5300-13B. **Table A-7** below shows a breakdown of costs for the crosswind runways for the minimum size requirements of A-I/B-I. The pavement replacement costs for the reduced sized minimum runway requirements for ineligible crosswind runways were set at a cost per square foot of \$11.34 identified as the life cycle cost estimate and applied to the total square footage of each of the crosswind runways.

**Table A-7 Minimum Pavement Replacement Cost for Reduced Crosswind Runways**

Airport	Minimum Runway Length Requirement	Minimum Runway Width Requirement	Minimum Runway Requirement (SF)	Minimum Pavement Replacement Cost*
Augusta State (AUG)	3,000	60	180,000	\$ 2,041,200.00
Caribou Municipal (CAR)	3,200	60	192,000	\$ 2,177,280.00
Central Maine Regional (OWK)	3,000	60	180,000	\$ 2,041,200.00
Dewitt Field/Old Town Municipal Airport (OLD)	3,000	60	180,000	\$ 2,041,200.00
Dexter Regional (1B0) **				\$ -
Greenville Municipal Airport (3B1)	3,400	60	204,000	\$ 2,313,360.00
Hancock County-Bar Harbor (BHB)	3,000	60	180,000	\$ 2,041,200.00
Houlton International Airport (HUL)***	2,700	60	162,000	\$ 1,837,080.00
Millinocket Municipal Airport (MLT)	3,000	60	180,000	\$ 2,041,200.00

Airport	Minimum Runway Length Requirement	Minimum Runway Width Requirement	Minimum Runway Requirement (SF)	Minimum Pavement Replacement Cost*
Waterville-Robert LaFleur Airport (WVL)***	2,301	60	138,060	\$ 1,535,600.40
<b>Total</b>				<b>\$ 18,099,320.40</b>

Source: McFarland Johnson, Inc analysis, 2023.

\*Costs reflect 2022-dollar value

\*\*The airport currently has a turf runway therefore it is not included in the analysis

\*\*Existing runway dimensions are smaller than the recommended minimum runway requirements recommended in the high-level runway length analysis.

In addition to the initial investment of rehabilitating an existing runway, the analysis also took into account the 20-year life cycle analysis of the rehabilitated pavement. This analysis used a 3,000-foot-long runway by 75 feet to generate the cost analysis. The analysis reflects 2022-dollar values. Over the 20-year lifecycle of the pavement after the initial asphalt replacement, two (2) crack seal projects are identified at the five (5) and 10-year marks, as well as a crack seal and repair project at the 15-year mark. **Table A-8** below shows a breakdown of the 20-year life cycle costs for maintaining existing runway pavement.

**Table A-8: 20-Year Life Cycle Cost for Initial Asphalt Reconstruction and Maintenance**

YEAR	DESCRIPTION	COST*
1	ASPHALT RECONSTRUCTION	\$2,600,000.00
2	-	-
3	-	-
4	-	-
5	CRACK SEAL	\$127,500.00
6	-	-
7	-	-
8	-	-
9	-	-
10	CRACK SEAL	\$165,000.00
11	-	-
12	-	-
13	-	-
14	-	-
15	CRACK SEAL & REPAIR	\$330,000.00

YEAR	DESCRIPTION	COST*
16	-	-
17	-	-
18	-	-
19	-	-
20		
<b>TOTAL</b>		<b>\$3,222,500.00</b>
<b>Cost per square foot</b>		<b>\$14.32</b>

*McFarland Johnson Inc, Analysis, 2023*

\*Costs reflect 2022-dollar value

**Table A-9** below is a 20-year life cycle comparison between the current crosswind runway square footage and the crosswind runway reduced to the minimum pavement requirement square footage using the cost per square footage of \$14.32. The cost is inclusive of the initial pavement reconstruction and the proceeding maintenance recommendations.

**Table A-9: 20-Year Life Cycle Comparison Current Pavement and Minimum Pavement\***

Airport	Crosswind Runway	Total Current Runway (SF)	Minimum Runway Requirements (SF)	20-Year Life Cycle Pavement Replacement Cost	20-Year Life Cycle Minimum Runway Cost
Augusta State (AUG)	RWY 08-26	195,975	180,000	\$2,806,362	\$2,577,600
Caribou Municipal (CAR)	RWY 11-29	226,275	192,000	\$3,240,258	\$2,749,440
Central Maine Regional (OWK)	RWY 13-21	319,840	180,000	\$4,580,109	\$2,577,600
Dewitt Field/Old Town Municipal Airport (OLD)	RWY 04-22	210,150	180,000	\$3,009,348	\$2,577,600
Dexter Regional (1B0) **	-	-	-	-	-
Greenville Municipal Airport (3B1)	RWY 03-21	225,075	204,000	\$3,223,074	\$2,921,280
Hancock County-Bar Harbor (BHB)	RWY 17-35	252,225	180,000	\$3,611,862	\$2,577,600
Houlton International Airport (HUL)***	RWY 01-19	162,000	180,000	\$2,319,840	\$2,319,840
Millinocket Municipal Airport (MLT)	RWY 16-34	400,000	180,000	\$5,728,000	\$2,577,600

Airport	Crosswind Runway	Total Current Runway (SF)	Minimum Runway Requirements (SF)	20-Year Life Cycle Pavement Replacement Cost	20-Year Life Cycle Minimum Runway Cost
Waterville-Robert LaFleur Airport (WVL)***	RWY 14-32	138,060	180,000	\$1,977,019	\$1,977,019
<b>Total</b>				<b>\$30,495,872</b>	<b>\$22,855,570</b>

Source: McFarland Johnson, Inc analysis, 2023.

\*Costs reflects 2022-dollar value

\*\*Airport currently has a turf runway therefore is not included in analysis

\*\*\*Existing runway dimensions are smaller than the recommended minimum runway requirements recommended in the high-level runway length analysis.

### Turf Runways

For airport sponsors that do not wish to fund and maintain existing pavement for the minimum A-I/B-I runway, but still provide an opportunity for A-I/B-I aircraft to access the airfield when the primary runway doesn't provide crosswind coverage, an alternative would be to transition to turf runways. Dexter Regional Airport(1B0) is an example of an airport in Maine that provides a turf crosswind runway to users. The transition to a turf runway would require field surveys, pavement removal, seeding, topsoil, and mulching. A representative cost estimate was performed to understand the financial implications associated with converting the existing asphalt crosswind runways to turf runways. A sample runway with dimensions of 75-feet by 3,000 linear feet was used for estimating purposes. It was assumed the existing runways consisted of approximately four (4) inches of asphalt and removal of the asphalt would be completed using cold milling practices, followed by installation of approximately four (4) inches of topsoil, seed, and mulch. Because the FAA does not have design standards for turf runways, no longitudinal or transverse grade corrections were anticipated and therefore construction was assumed to be maintained within the existing runway footprint. Other items, including erosion control best management practices, mobilization, and design and construction administration were also included. The approximate unit price cost for this representative work is approximately \$3.97 per square foot and can vary based on diverging from the assumptions and normal economic factors such as geographics.

The overall cost to transition to a turf runway is significantly more cost effective than replacing existing pavement, with a price per square foot of \$3.97 versus the \$11.34 price per square foot. More information on the cost analysis is available in **Attachment B**. The cost to transition the existing crosswind runways to turf runways are detailed in **Table A-10** below.

**Table A-10: Estimated Cost to Transition Existing Crosswind Runway from Asphalt to Turf\***

Airport	Crosswind Runway	Length	Width	Total Current Runway (SF)	Runway to Turf Costs
Augusta State (AUG)	RWY 08-26	2,613	75	195,975	\$778,020.75
Caribou Municipal (CAR)	RWY 11-29	3,017	75	226,275	\$898,311.75
Central Maine Regional (OWK)	RWY 13-21	3,998	80	319,840	\$1,269,764.80
Dewitt Field/Old Town Municipal Airport (OLD)	RWY 04-22	2,802	75	210,150	\$834,295.50
Dexter Regional (1B0)**	RWY 07-25	1,249	120	149,880	\$0.00
Greenville Municipal (3B1)	RWY 03-21	3,001	75	225,075	\$893,547.75
Hancock County-Bar Harbor (BHB)	RWY 17-35	3,363	75	252,225	\$1,001,333.25
Houlton International (HUL)	RWY 01-19	2,700	60	162,000	\$643,140.00
Millinocket Municipal (MLT)	RWY 16-34	4,000	100	400,000	\$1,588,000.00
Waterville-Robert LaFleur (WVL)	RWY 14-32	2,301	60	138,060	\$548,098.20
<b>Total</b>					<b>\$8,454,512</b>

Source: McFarland Johnson, Inc analysis, 2023.

\*Costs reflects 2022-dollar value

\*\* This crosswind runway is a turf runway and therefore the costs developed for this analysis do not apply as they pertain to paved runways.

To provide a better understanding of the life cycle costs of the transition from pavement to turf runways over a 20-year period, an analysis was conducted that used a 3,000-foot-long runway by 75 feet to generate the costs. The analysis of the 20-year life cycle includes the initial investment of the transition to turf in the first year. The analysis also includes mowing annually to maintain the turf runways, as well as rolling the turf every other year for the 20 years. The costs included in the analysis reflect the present value of the projects and do not include inflation. **Table A-11** below provides a breakdown of the costs for the 20-year life cycle of transitioning a paved runway to turf.

**Table A-11: 20-Year Life Cycle from Asphalt Runway to Turf**

YEAR	DESCRIPTION	COST *
1	PAVEMENT TO TURF	\$900,000.00
2	MOWING	\$9,000.00
3	MOWING & ROLLING	\$9,200.00
4	MOWING	\$9,000.00
5	MOWING & ROLLING	\$9,000.00
6	MOWING	\$9,000.00
7	MOWING & ROLLING	\$9,000.00

YEAR	DESCRIPTION	COST *
8	MOWING	\$9,000.00
9	MOWING & ROLLING	\$9,000.00
10	MOWING	\$9,000.00
11	MOWING & ROLLING	\$9,000.00
12	MOWING	\$9,000.00
13	MOWING & ROLLING	\$9,000.00
14	MOWING	\$9,000.00
15	MOWING & ROLLING	\$9,000.00
16	MOWING	\$9,000.00
17	MOWING & ROLLING	\$9,000.00
18	MOWING	\$9,000.00
19	MOWING & ROLLING	\$9,000.00
20	MOWING	\$9,000.00
	<b>TOTAL</b>	<b>\$1,071,200.00</b>
	<b>Cost per square foot</b>	<b>\$4.76</b>

Source: McFarland Johnson Inc, analysis, 2023.

\*Costs reflects 2022-dollar value

### Justification for Right-Sizing Infrastructure

In the State of Maine, Princeton Municipal (PNN), Belfast Municipal (BST), and Eastport Municipal (EPM) are all examples of local airports that have decommissioned crosswind runways. Belfast Municipal was able to transition a portion of the previous crosswind runway into a taxiway, hangar development area, and apron space in order to optimize the airport property for operational efficiency and growth. Eastport Municipal transitioned a portion of the previous crosswind runway into a taxiway providing access from apron and hangar facilities to the runway. These are prime examples of opportunities to airports that may not find high enough value in maintaining their ineligible crosswind runways. Airports can utilize existing facilities to enhance airport operations, development, and growth. Several other airports currently operate as single runways: Eastern Slopes Regional Airport (IZG), Bethel Regional Airport (OB1), Oxford County Regional Airport (81B), Steven A. Bean Municipal Airport (8B0), Sugarloaf Regional Airport (B21), Newton Field Airport (59B), Pittsfield Municipal Airport (2B7), Northern Aroostook Regional Airport (FVE), Lincoln Regional Airport (LRG), Wiscasset Airport (IWI), Brunswick Executive Airport (BXM), Stonington Municipal (93B), Islesboro Airport (57B) and Biddeford Municipal Airport (B19). If operating as a single runway airport was detrimental to the operation and function of the airport, then this issue would have been identified many years ago.

**Figure A-1** below depicts the existing condition at Belfast Municipal Airport. The eastern portion of the airfield has been transitioned from the crosswind runway to a hanger development as the western portion of the previous crosswind has been removed as low-cost solution to stormwater mitigation to support airfield development.

**Figure A-1: Belfast Municipal Airport**



Source: Google Earth, 2019

It should be noted that operations during weather conditions when the primary runway does not offer crosswind coverage to A-I/B-I aircraft are up to the pilot's discretion. In this scenario, pilots can determine if safe operations are viable depending on their individual aircraft characteristics or pilots can opt to divert to nearby airports with wind conditions favorable for their aircraft.

## Conclusion

A summary table of costs that were analyzed in this study are detailed below in **Table A-12**, the total cost of replacing the existing ineligible crosswind runways would be approximately \$24,200,000.00; the total cost of reducing to the minimum A-I/B-I runway requirements would be approximately \$18,100,000.00; and the total cost of converting asphalt crosswind runways to turf

**Table A-12: Summary Cost Analysis for Current Pavement Reconstruction, Reduction to Minimum Pavement, and Transition to Turf \***

Airport	Crosswind Runway	Total Runway (SF)	Minimum Runway (SF)	Current Pavement Replacement Cost	Minimum Runway Cost	Runway to Turf Costs
Augusta State (AUG)	RWY 08-26	195,975	180,000	\$2,222,357	\$2,041,200	\$778,020
Caribou Municipal (CAR)	RWY 11-29	226,275	192,000	\$2,565,959	\$2,177,280	\$898,311
Central Maine Regional (OWK)	RWY 13-21	319,840	180,000	\$3,626,986	\$2,041,200	\$1,269,764
Dewitt Field-Old Town Municipal Airport (OLD)	RWY 04-22	210,150	180,000	\$2,383,101	\$2,041,200	\$834,295
Dexter Regional (1B0)**	RWY 07-25	149,880	-	-	-	-
Greenville Municipal Airport (3B1)	RWY 03-21	225,075	204,000	\$2,552,351	\$2,313,360	\$893,547
Hancock County-Bar Harbor (BHB)	RWY 17-35	252,225	180,000	\$2,860,232	\$2,041,200	\$1,001,333
Houlton International Airport (HUL)***	RWY 01-19	162,000	162,000	\$1,837,080	\$1,837,080	\$643,140



Airport	Crosswind Runway	Total Runway (SF)	Minimum Runway (SF)	Current Pavement Replacement Cost	Minimum Runway Cost	Runway to Turf Costs
Millinocket Municipal Airport (MLT)	RWY 16-34	400,000	180,000	\$4,536,000	\$2,041,200	\$1,588,000
Waterville Airport (WVL)***	RWY 14-32	138,060	138,060	\$1,565,600	\$1,565,600	\$548,098
<b>Total</b>				<b>\$24,149,664</b>	<b>\$18,099,320</b>	<b>\$8,454,512</b>

Source: McFarland Johnson, Inc. analysis, 2023.

\*Costs reflects 2022-dollar value

\*\*Airport currently has a turf runway therefore is not included in analysis

\*\*\*Existing runway dimensions are smaller than the recommended minimum runway requirements recommended in the high-level runway length analysis.

Note: Minimum runway cost refers to reducing the runway size to a minimum A-I/B-I runway requirement. The turf costs are related to transitioning an asphalt runway to a turf runway that is less costly per sq ft. A turf runway helps the airport maintain the ability to A-I/B-I aircraft to access the airfield when the primary runway doesn't provide crosswind coverage.

An additional summary table of the initial costs plus the 20-year lifecycle costs are provided in **Table A-13** below.

**Table A-13: Summary 20-Year Lifecycle Cost Analysis for Current Pavement Replacement, Reduction to Minimum Runway and Transition to Turf\***

Airport	Crosswind Runway	Total Runway (SF)	Minimum Runway (SF)	20- Year Life Cycle Current Pavement Replacement Cost	20-Year Life Cycle Minimum Runway Cost	20- Year Life Cycle Runway to Turf Costs
Augusta State (AUG)	RWY 08-26	195,975	180,000	\$2,806,362	\$2,577,600	\$932,841
Caribou Municipal (CAR)	RWY 11-29	226,275	192,000	\$3,240,258	\$2,749,440	\$1,077,069
Central Maine Regional (OWK)	RWY 13-21	319,840	180,000	\$4,580,109	\$2,577,600	\$1,522,438

Airport	Crosswind Runway	Total Runway (SF)	Minimum Runway (SF)	20- Year Life Cycle Current Pavement Replacement Cost	20-Year Life Cycle Minimum Runway Cost	20- Year Life Cycle Runway to Turf Costs
Dewitt Field-Old Town Municipal Airport (OLD)	RWY 04-22	210,150	180,000	\$3,009,348	\$2,577,600	\$1,000,314
Dexter Regional (1B0)**	RWY 07-25	149,880		-	-	-
Greenville Municipal Airport (3B1)	RWY 03-21	225,075	204,000	\$3,223,074	\$2,921,280	\$1,071,357
Hancock County-Bar Harbor (BHB)	RWY 17-35	252,225	180,000	\$3,611,862	\$2,577,600	\$1,200,591
Houlton International Airport (HUL)***	RWY 01-19	162,000	162,000	\$2,319,840	\$2,319,840	\$771,120
Millinocket Municipal Airport (MLT)	RWY 16-34	400,000	180,000	\$5,728,000	\$2,577,600	\$1,904,000
Waterville Airport (WVL) ***	RWY 14-32	138,060	138,060	\$1,977,019	\$1,977,019	\$657,166
<b>Total</b>				<b>\$30,495,872</b>	<b>\$22,855,579</b>	<b>\$10,136,896</b>

*McFarland Johnson, Inc analysis, Inc, 2023.*

\*Costs reflects 2022-dollar value

\*\*Airport currently has a turf runway therefore is not included in analysis

\*\*\*Existing runway dimensions are smaller than the recommended minimum runway requirements recommended in the high-level runway length analysis.

## Recommendations

The idea behind right-sizing a facility is not just to ensure that the investments strategically target the facility needs, it also ensures that limited federal, state, and local funding are able to extend further by doing less. Sacrificing low value facilities allows more investment in areas desired. The following recommendations address airports based on their asset category.

For primary commercial service airports, Portland International Jetport (PWM), Presque Isle International (PQI) and Knox County Regional (RKD) are all eligible to maintain as asphalt runways. Bangor International (BGR) does not have a crosswind runway, but further analysis should be considered for maintaining a larger width during a master plan level analysis to accommodate cross wind components.

For regional airports, Sanford Seacoast Regional (SFM) and Auburn/Lewiston (LEW) are eligible to maintain as asphalt runways. Augusta State (AUG) is ineligible. With neighboring airports Waterville-Robert LaFleur (WVL) and Auburn/Lewiston (LEW) having justifiable (or nearly justifiable in WVL's case) crosswinds for FAA funding, Augusta could be supported in close proximity. Furthermore, the airport and possibly the FBO would significantly benefit from the redevelopment of the runway areas into hangars to support more based aircraft. However, this may affect the flight school operating in Augusta, as their training aircraft fall within the A-I/B-I category. A business case would need to justify supporting the workforce development of the flight school versus the cost of replacing the existing crosswind runway.

Hancock County/Bar Harbor (BHB) does not fulfill the eligibility requirements. If the BHB crosswind is not justified during a master plan level analysis, it may benefit BHB to redevelop the runway for non-aeronautical revenue generation. Although there may be enough A-I/B-I operations in BHB to justify the regular use, with nearly 97 percent wind coverage, there is very little argument to support the cost based upon the 3 percent potential of non-use for small aircraft due to crosswinds. The primary runway has a width of 100ft which provides some support for smaller aircraft in cross wind conditions. If aircraft were not able to land at BHB, they could be supported by Bangor (BGR), Knox County Regional (RKD) or Augusta State (AUG). Princeton Municipal (PNN), Machias Valley (MVM) and Eastport Municipal (EPM) would then be substantially distanced from an airport with 100 percent crosswind capabilities.

Millinocket Municipal (MLT) and Greenville Municipal (3B1) may be substantially distanced from a nearby airport with crosswind capabilities for A-I/B-I aircraft. It is under these circumstances that it is recommended MaineDOT support at a minimum the transition to turf runways, regardless of FAA eligibility, to provide crosswind coverage to A-I/B-I aircraft while maintaining lower costs over the next 20-year period.

Although Houlton International (HUL) and Caribou Municipal (CAR) meet the threshold for wind coverage, their usage doesn't support the value in the costly investment and maintenance costs of a paved crosswind runway for less than 6.04 percent of the available time. Furthermore, these facilities can be supported by PQI with 100 percent wind coverage. It is recommended that these pavements be maintained to maximize their useful life to perverse the previous investments and decommissioned once no longer serviceable. To clarify, this does not mean milling and overlay, or re-paving to meet the FAA definition of maintenance.

Dexter Regional (1B0) already utilizes a turf crosswind runway and further study with various equipment investment should be conducted in establishing best management practices and recommendations for implementation and providing a resource to other facility managers.

Central Maine Regional (OWK) is another facility that can be supported by neighboring airports and cannot justify the investment for less than 4.23 percent of the time cross wind conditions. It is recommended to maintain the pavements until the condition is no longer serviceable.

The analysis also does not support new development of a crosswind runway at Biddeford Municipal (B19) regardless of FAA eligibility, as there are alternate airports within the service area that provide the coverage, such as Portland International Jetport (PWM) and Sanford Seacoast Regional (SFM).

In addition to the recommendations of this memorandum, it is also recommended that airport sponsors on the list of airports that do not meet the crosswind runway eligibility requirements as defined by the FAA, verify the crosswind eligibility on an individual-airport basis. On the master planning level, a cost-benefit analysis of maintaining an ineligible crosswind runway in the existing condition, minimum standard condition, and a transition to turf runways should also be analyzed. Additionally, it is at the master-planning level that analysis into decommissioning a runway should be analyzed.

## Attachment A – Pavement Replacement Costs



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ENGINEER'S OPINION OF PROBABLE COSTS					
Project: <b>MaineDOT SASP</b>					
Runway Rehab					
April 2023					
<b>3000LF X 75 FT RUNWAY REHAB</b>					
Bid Item	Description Of Item	Unit	Quantity	Unit Price	Engineer's Estimate
C-100	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	LS	1	\$150,000.00	\$150,000.00
C-102-5.1c	STABILIZED CONSTRUCTION ENTRANCE	EA	1	\$2,000.00	\$2,000.00
C-102-5.1d	INSTALLATION AND REMOVAL OF SILT FENCE	LF	6,600	\$4.00	\$26,400.00
C-105	MOBILIZATION	LS	1	\$180,600.00	\$180,600.00
M-110-1	ENGINEER'S FIELD OFFICE	MO	1	\$10,000.00	\$10,000.00
M-150-1	FIELD SURVEY AND STAKEOUT	LS	1	\$25,000.00	\$25,000.00
M-200-1	MAINTENANCE AND PROTECTION OF TRAFFIC	LS	1	\$361,100.00	\$361,100.00
P-101-5.6	COLD MILLING	SY	26,300	\$8.00	\$210,400.00
P-152-5.1	UNCLASSIFIED EXCAVATION	CY	2,800	\$25.00	\$70,000.00
P-401-8.1	ASPHALT SURFACE COURSE	TON	6,000	\$180.00	\$1,080,000.00
P-603-5.1	EMULSIFIED ASPHALT TACK COAT	GAL	5,900	\$7.00	\$41,300.00
P-620-5.2b	MARKING	SF	3,800	\$2.00	\$7,600.00
P-620-5.3c	REFLECTIVE MEDIA	LB	300	\$2.00	\$600.00
T-901-5.1	SEEDING	kSF	300	\$200.00	\$60,000.00
T-905-5.1	TOPSOIL (FURNISHED FROM ON SITE)	CY	1,400	\$25.00	\$35,000.00
T-905-5.2	TOPSOIL (FURNISHED FROM OFF THE SITE)	CY	2,100	\$40.00	\$84,000.00
T-908-5.1	MULCHING	kSF	300	\$10.00	\$3,000.00
	SUBTOTAL				\$1,805,300.00
	TOTAL (BASE BID - CONSTRUCTION ONLY)				\$2,347,000.00
	PERMITTING				\$25,000.00
	GRANT ADMINISTRATION				\$25,000.00
	DESIGN				\$234,700.00
	CA/RPR				\$180,000.00
	<b>GRAND TOTAL</b>				<b>\$2,552,000.00</b>
	<b>TOTAL / SF</b>				<b>\$11.34</b>

Source: McFarland Johnson, Inc, 2023

Note: Based in 2023 dollars

## Attachment B – Runway to Turf Costs



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ENGINEER'S OPINION OF PROBABLE COSTS					
Project: <b>MaineDOT SASP</b>					
Runway Pavement to Turf					
April 2023					
<b>3000LF X 75 FT PAVEMENT TO TURF</b>					
Bid Item	Description Of Item	Unit	Quantity	Unit Price	Engineer's Estimate
C-102-5.1c	STABILIZED CONSTRUCTION ENTRANCE	EA	1	\$2,000.00	\$2,000.00
C-102-5.1d	INSTALLATION AND REMOVAL OF SILT FENCE	LF	6,190	\$4.00	\$24,760.00
C-105	MOBILIZATION	LS	1	\$42,100.00	\$42,100.00
M-110-1	ENGINEER'S FIELD OFFICE	MO	1	\$10,000.00	\$10,000.00
M-150-1	FIELD SURVEY AND STAKEOUT	LS	1	\$25,000.00	\$25,000.00
M-200-1	MAINTENANCE AND PROTECTION OF TRAFFIC	LS	1	\$105,100.00	\$105,100.00
P-101-5.6	COLD MILLING	SY	26,300	\$8.00	\$210,400.00
T-901-5.1	SEEDING	kSF	300	\$200.00	\$60,000.00
T-905-5.2	TOPSOIL (FURNISHED FROM OFF THE SITE)	CY	3,000	\$40.00	\$120,000.00
T-908-5.1	MULCHING	kSF	300	\$10.00	\$3,000.00
	SUBTOTAL				\$420,160.00
	TOTAL (CONSTRUCTION ONLY)				\$602,400.00
	PERMITTING				\$25,000.00
	GRANT ADMINISTRATION				\$25,000.00
	DESIGN				\$60,240.00
	CA/RPR				\$180,000.00
	<b>GRAND TOTAL</b>				<b>\$892,640.00</b>
	TOTAL / SF				<b>\$3.97</b>

Source: McFarland Johnson, Inc, 2023

Note: Based in 2023 dollars



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## MEMORANDUM

**TO:** Maine Department of Transportation

**FROM:** McFarland Johnson, Inc

**DATE:** April 4, 2023

**SUBJECT:** State-Wide Taxiway Width Eligibility and Costs

**PROJECT NO.:** MaineDOT WIN# 018717.03; MJ# 19008.00

### Introduction

It has been observed that several Maine airports within their current Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS) role have taxiways that exceed the width requirements specified for their designated role and Taxiway Design Group (TDG). Consequently, an analysis has been conducted to assess the State's responsibility in funding the maintenance of these wider taxiways. The purpose of this analysis is to determine if and to what extent the State should allocate funds for the maintenance of taxiways that surpass the TDG guidelines. To facilitate this decision-making process, the memo outlines specific criteria that the State can utilize to evaluate the funding allocation for the maintenance of such taxiways. The analysis in this study will identify airports from their associated NPIAS asset roles to determine the recommended eligibility for state funding for taxiways that exceed their design criteria. These roles guide the level of service and infrastructure required for each airport category, facilitating effective planning, funding allocation, and development. In addition to the NPIAS roles, the width of taxiways at airports is determined by Aircraft Design Group (ADG) and Taxiway Design Group (TDG) considerations. This analysis aims to evaluate taxiway width conditions, specifically identifying airports that need assessment and developing a 20-year life cycle analysis per square foot to determine estimated costs associated with different widths.

### Airport NPIAS Service Level Roles

The NPIAS classifies airports into various asset roles to define their significance and purpose within the National Aviation System. These roles include Primary Commercial Service, Regional, Local, Basic, and Unclassified airports. As defined by the FAA, Primary airports are commercial service airports that have more than 10,000 passengers boarding annually. Regional airports serve as general aviation transportation hubs for a broader geographic area. They provide essential connectivity for regional travel and play a crucial role in economic development. Two (2) of the airports classified as regional airports act as designated reliever airports for the SASP. Local airports play a significant role by connecting nearby communities to regional centers. They offer a wider range of services and facilities, including cargo operations and general aviation activities. Basic airports typically serve smaller communities and fulfill essential aviation needs such as

general aviation, emergency services, and recreational flying. They provide a vital link to air transportation for these localities. Lastly, unclassified airports are those that have not been assigned a specific role in the NPIAS due to factors such as limited activity or specialized operations. These airports may cater to unique purposes such as remote locations and island communities. By categorizing airports into these roles, the NPIAS helps identify the level of service and infrastructure needed for each airport category, facilitating effective planning, funding allocation, and development to ensure a robust and efficient aviation network across the country.

**Taxiway Design Group and Aircraft Design Group**

The NPIAS role informs the State of individual airport’s roles in the System as a whole, and provides a general activity level, but may differ from what the classification of the Taxiway Design Group (TDG) and the Aircraft Design Group (ADG) dictates. The ADG classification categorizes aircraft based on their wingspan and tail height, which directly impacts the required width of taxiways to ensure safe maneuvering and clearance. Different ADG classifications may necessitate varying taxiway widths to accommodate the specific aircraft types operating at the airport. Furthermore, the TDG considers factors such as the maximum wingspan of aircraft using a particular taxiway and the desired separation distance between aircraft and various objects or structures. Taxiway design standards are detailed in **Figure A-1** below.

**Figure A-1: FAA Design Standards Based on Taxiway Design Group (TDG)**

**Table 4-2. Design Standards Based on Taxiway Design Group (TDG)**

Item	TDG							
	1A	1B	2A	2B	3	4	5	6
Taxiway/Taxilane Width <sup>1</sup>	25 ft (7.6 m)	25 ft (7.6 m)	35 ft (10.7 m)	35 ft (10.7 m)	50 ft (15.2 m)	50 ft (15.2 m)	75 ft (22.9 m)	75 ft (22.9 m)
Taxiway Edge Safety Margin <sup>1</sup>	5 ft (1.5 m)	5 ft (1.5 m)	7.5 ft (2.3 m)	7.5 ft (2.3 m)	10 ft (3 m)	10 ft (3 m)	14 ft (4.3 m)	14 ft (4.3 m)
Taxiway Shoulder Width <sup>2</sup>	10 ft (3 m)	10 ft (3 m)	15 ft (4.6 m)	15 ft (4.6 m)	20 ft (6.1 m)	20 ft (6.1 m)	30 ft (9.1 m)	30 ft (9.1 m)
Taxiway/Taxilane Centerline to Parallel Taxiway/Taxilane Centerline w/180 Degree Turn	See <a href="#">Table 4-6</a> and <a href="#">Table 4-7</a> .							

**Note 1:** See [Figure 4-4](#).  
**Note 2:** When the most demanding aircraft has four engines and is TDG 6, the standard taxiway shoulder width is 40 feet (12.2 m).

Source: FAA AC 150 /5300-13B.

By considering both the ADG and TDG, airport designers and planners can determine the appropriate width for taxiways, allowing for efficient aircraft movements and ensuring the safety of operations. The NPIAS roles give insight into the general activity of the airport that might not align with the requirements determined by the designated TDG. Therefore, alongside the NPIAS roles, the ADG and TDG classifications play a crucial role in determining the right-sized width of taxiways at airports, enabling effective design, planning, and development to meet the unique requirements of different aircraft and enhance the overall functionality of the aviation network.

**Table A-2** below provides the NPIAS role, ADG, and TDG for all 35 airports within the State of Maine included in the study. The most up-to-date Airport Layout Plan (ALP) or Masterplan was



reviewed for the designated TDG and ADG. If not enough information was provided from the documents, a TDG was determined based on the taxiway width, critical aircraft, ADG, and/or aerial measurements.

**Table A-2: Maine Airports and TDGs**

ID	Airport Name	NPIAS Category	NPIAS Role	MPU/ALPU Year	AAC/ADG Existing	AAC/ADG Future	Current Taxiway Design Group
LEW	Auburn/Lewiston Muni	Reliever	Regional	2007	B-II	B-II	2A
AUG	Augusta State	Commercial Service – Non-primary	Regional	2015	B-II	B-II	2A
BGR	Bangor Intl	Commercial Service – Primary		2017	C-IV	C-IV	5*
BST	Belfast Muni	General Aviation	Basic	2018	B-II	B-II	1A
OB1	Bethel Regional	General Aviation	Local	2012	B-II	B-II	2A
B19	Biddeford Muni	General Aviation	Local	2022	A-I (small)	A-I (small)	1A
BXM	Brunswick Executive	General Aviation	Local	2013	C-III	C-III	3*
CAR	Caribou Muni	General Aviation	Basic	1999	B-II	B-II	2A
OWK	Central Maine Regional	General Aviation	Local	2008	B-II	B-II	2A
44B	Charles A Chase Jr Memorial Field	General Aviation	Unclassified	No Master Plan or ALP Available			N/A **
OLD	Dewitt Fld-Old Town Muni	General Aviation	Local	2020	B-II	B-II	1B*

ID	Airport Name	NPIAS Category	NPIAS Role	MPU/ALPU Year	AAC/ADG Existing	AAC/ADG Future	Current Taxiway Design Group
1B0	Dexter Regional	General Aviation	Local	2019	A-I (small)	A-I (small)	1A
IZG	Eastern Slope Regional	General Aviation	Local	2008	B-II	B-II	2A
EPM	Eastport Muni	General Aviation	Basic	2007	B-I	B-I	1A*
3B1	Greenville Muni	General Aviation	Local	2016	B-II	B-II	1A*
BHB	Hancock County-Bar Harbor	Commercial Service-Non-Primary	Local	2011	C-II	C-II	2A
HUL	Houlton Intl	General Aviation	Local	2019	B-II	B-II	2A
57B	Islesboro	General Aviation	Unclassified	No Master Plan or ALP Available			1B*
RKD	Knox County Regional	Commercial Service – Primary		2002	C-II	C-II	2A
LRG	Lincoln Regional	General Aviation	Local	2010	B-I (small)	B-I (small)	1A
MVM	Machias Valley	General Aviation	Basic	2015	A-I	A-I	1A*
MLT	Millinocket Muni	General Aviation	Local	2007	B-II	B-II	1A*
59B	Newton Field	General Aviation	Basic	2019	B-I	B-II	2A
FVE	Northern Aroostook Regional	General Aviation	Basic	2019	B-I	B-II	2A
81B	Oxford County Regional	General Aviation	Basic	2007	B-I	B-I	1A*
2B7	Pittsfield Muni	General Aviation	Local	2017	B-II	B-II	2A

ID	Airport Name	NPIAS Category	NPIAS Role	MPU/ALPU Year	AAC/ADG Existing	AAC/ADG Future	Current Taxiway Design Group
PWM	Portland Intl Jetport	Commercial Service - Primary		2019	C-IV/D-I/D-II	C-IV/D-I/D-II	3*
PQI	Presque Isle Intl	Commercial Service - Primary		2022	B-II	C-III	3*
SFM	Sanford Seacoast Regional	Reliever	Regional	2017	D-II	C-III	3*
8B0	Steven A Bean Muni	General Aviation	Basic	2018	A-I (small)	B-II	1A*
93B	Stonington Muni	General Aviation	Unclassified	No Master Plan or ALP Available			1A*
B21	Sugarloaf Regional	General Aviation	Basic	2012	A-I (small)	A-I (small)	1A*
WVL	Waterville-Robert Lafleur	General Aviation	Local	2014	C-II	C-II	2B
IWI	Wiscasset	General Aviation	Local	2016	B-II	B-II	2A

McFarland Johnson, Inc. analysis, 2023.

\* Minimum Taxiway Design Group based on the width of the Taxiway or alternative measurements

\*\*N/A: No taxiway (turf)

### Statewide Issues and Challenges

The FAA determines pavement eligibility based upon historic regular use defined as 500 operations of TDG and ADG category of aircraft annually. The FAA approach can result in airports that are undersized for the fleet mix that currently utilizes the System and exclude aircraft from operating at these airports in the future. Although an aircraft may not operate 500 times within a year, the value of these operations is substantial to the communities these airports serve. The resulting reduction of infrastructure size from the FAA approach threatens the airports' ability to provide critical community access and emergency preparedness and response throughout the state.

## Recommendations

Below are the following four (4) recommendations to be considered for the study and its results. These recommendations seek to strike a balance between right-sized taxiway widths with the community needs the airport serves while encouraging access throughout the state.

1. Small Local and Basic airports that fall into the Taxiway Design Group (TDG) of 1A or 1B and do not historically have enough operations under the FAA-defined regular use to qualify for 2A or 2B, cannot justify a larger than 25-foot taxiway width. It is recommended that through the masterplan process, these airports designate at least one (1) route to the apron where larger aircraft than TDG allows for can remove themselves from the runway environment safely.
2. Airports that are categorized into the TDG of 2A or 2B, and historically fall into the regular use of aircraft within that category justify a 35-foot taxiway width. This is sufficient to handle a majority of the aircraft class that utilize the airport. Depending upon the specifics of the airport, the airport may be able to justify a route to the apron under the TDG category of 3 or a 50-foot taxiway width.
3. Regional airports that cannot justify a designated TDG 3, 2A, or 2B TDG under FAA guidelines might see their taxiway widths reduced to 25 feet. This downgrade could jeopardize the crucial role these airports play in the System, as these airports act as reliever airports as well as provide functions of critical community access and emergency preparedness. A larger aircraft would be unable to utilize the runway with a reduced taxiway width and may need to use an alternative airport in the future. It is recommended that these airports designate at least one (1) route to the apron that is classified as a TDG 3, with a 50-foot taxiway width, enabling larger aircraft to remove themselves from the runway environment safely.
4. Commercial service airports should have at least one route that qualifies for aircraft that are larger than their designated TDG (i.e. if they are a TDG 2A they should have at least one (1) route of taxiway width that meets TDG 3 standards). These airports are typically larger and should have the capacity to accept larger than regular use aircraft and be able to remove themselves from the runway environment safely.

## Taxiway Width Analysis

The taxiway widths analysis was performed to determine the conditions that merit the State's participation in maintaining taxiways in the primary commercial, regional, local, basic, and unclassified level airports. An assessment of the right-sized taxiway widths for Maine SASP determined by each airport's designated Taxiway Design Group (TDG) and their current corresponding taxiway widths was performed. The analysis was broken out by the following NPIAS service role levels:

- Commercial - Primary
- Regional
- Local and Basic

- Unclassified

Throughout the analysis, highlighted in red are taxiway widths at airports that are beyond their designated TDG requirements, indicating potential deviations from the recommended standards.

### Commercial – Primary Airports – Taxiway Analysis

There are four (4) primary commercial service airports within the Maine SASP:

- Bangor International Airport (BGR)
- Knox County Regional Airport (RKD)
- Portland International Jetport (PWM) and
- Presque Isle International Airport (PQI)

Three (3) of these airports (BGR, PWM, PQI) have at least one or more Taxiway(s) that measure 75 feet (the highest taxiway width) fulfilling the recommended requirements for larger aircraft to exit the runway safely and therefore are not included in the analysis. It is recommended that these airports continue to take into consideration the recommendations of the study in their master planning process for continued access to at least one route for larger aircraft to exit the runway environment safely.

Knox County Regional Airport which has a TDG of 2A is analyzed for this study in **Table A-3**. The table highlights in red any instances where a taxiway has been constructed wider than the TDG specifications.

**Table A-3: Commercial - Primary Airport Taxiway Width Analysis**

ID	Airport Name	NPIAS Category	ADG (existing)	TDG	TW	Existing TW Width (ft)
RKD	KNOX COUNTY REGIONAL	Commercial Service - Primary	C-II	2A	ALL	50

Source: McFarland Johnson, Inc Analysis, 2023

### Regional Airports - Taxiway Analysis

The Regional NPIAS service role encompasses airports that serve as transportation hubs for broader geographic areas, accommodating a higher volume of passenger and cargo traffic and two (2) act as a reliever airport to support the SASP. Three (3) airports are designated as regional role classifications within the Maine SASP:

- Auburn-Lewiston Municipal Airport (LEW) is also a designated reliever airport
- Augusta State Airport (AUG)
- Sanford Seacoast Regional Airport (SFM) is also a designated reliever airport

To gain insights into their infrastructure and operational characteristics, **Table A-4** provides information on existing taxiway widths at airports falling under the regional role. The table highlights in red any instances where a taxiway exceeds the TDG specifications.

Table A-4 Regional Airports Taxiway Width Analysis

ID	Airport Name	NPIAS Role	ADG (existing)	TDG (existing)	TW	Existing TW Width (ft)
LEW	Auburn/Lewiston Muni	Regional	B-II	2A	CTB-001	35
LEW	Auburn/Lewiston Muni	Regional	B-II	2A	CTB-002	35
LEW	Auburn/Lewiston Muni	Regional	B-II	2A	CTC-001	35
LEW	Auburn/Lewiston Muni	Regional	B-II	2A	CTD-001	30
LEW	Auburn/Lewiston Muni	Regional	B-II	2A	CTE-001	35
LEW	Auburn/Lewiston Muni	Regional	B-II	2A	CTH-001	35
LEW	Auburn/Lewiston Muni	Regional	B-II	2A	CTJ-001	50
LEW	Auburn/Lewiston Muni	Regional	B-II	2A	PTA-001	35
AUG	Augusta State	Regional	B-II	2A	CTB-001	40
AUG	Augusta State	Regional	B-II	2A	CTB-002	40
AUG	Augusta State	Regional	B-II	2A	CTC-001	50
AUG	Augusta State	Regional	B-II	2A	CTC1-001	50
AUG	Augusta State	Regional	B-II	2A	CTF-001	45
AUG	Augusta State	Regional	B-II	2A	PTC-002	40
AUG	Augusta State	Regional	B-II	2A	PTC-003	40
AUG	Augusta State	Regional	B-II	2A	PTC-004	50

ID	Airport Name	NPIAS Role	ADG (existing)	TDG (existing)	TW	Existing TW Width (ft)
AUG	Augusta State	Regional	B-II	2A	PTE-001	40
AUG	Augusta State	Regional	B-II	2A	PTE-002	40
AUG	Augusta State	Regional	B-II	2A	PTE-003	40
AUG	Augusta State	Regional	B-II	2A	PTE-004	55
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	PTE-001	35
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	PTE-002	35
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	PTE-003	40
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	PTF-001	35
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	CTA-001	50
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	CTA-002	50
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	CTB-001	50
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	CTC-001	50
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	CTC-002	50
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	CTD-001	50
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	CTF1-001	35
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	CTG-001	35

ID	Airport Name	NPIAS Role	ADG (existing)	TDG (existing)	TW	Existing TW Width (ft)
SFM	Sanford Seacoast Regional	Regional	D-II/C-III	3*	CTI-001	15

Source: McFarland Johnson, Inc Analysis, 2023

\* Minimum Taxiway Design Group based on the width of the Taxiway or alternative measurements

Note: PT= Parallel Taxiway/CT = Connecting Taxiway

### Local and Basic Airports Taxiway Analysis

The following section provides a comprehensive overview of existing taxiway widths at airports falling under the basic and local roles and includes ADG, TDG, and NPIAS roles. Maine SASP has 10 airports that are designated as basic and 15 airports that are designated as local. **Table A-5** highlights in red any instances where a taxiway has been constructed wider than the TDG specifications, indicating potential deviations from the recommended standards.

**Table A-5: Local and Basic Airports Taxiway Width Analysis**

ID	Airport Name	NPIAS Role	ADG (existing)	TDG (existing)	TW	Existing TW Width (ft)
BST	Belfast Muni	Local	B-II	1A	PTA-002	25
BST	Belfast Muni	Local	B-II	1A	PTA-001	40
BST	Belfast Muni	Local	B-II	1A	CTB-001	45
BST	Belfast Muni	Local	B-II	1A	CTC-001	60
OB1	Bethel Regional	Local	B-II	2A	CTA-001	35
OB1	Bethel Regional	Local	B-II	2A	CTB-001	35
B19	Biddeford Muni	Local	A-I (small)	1A	CTA-001	50
BXM	Brunswick Executive	Local	C-III	3*	PTA-001	75
BXM	Brunswick Executive	Local	C-III	3*	PTA-002	75
BXM	Brunswick Executive	Local	C-III	3*	PTA-003	75
BXM	Brunswick Executive	Local	C-III	3*	CTA2-001	75
BXM	Brunswick Executive	Local	C-III	3*	CTA3-001	75



ID	Airport Name	NPIAS Role	ADG (existing)	TDG (existing)	TW	Existing TW Width (ft)
BXM	Brunswick Executive	Local	C-III	3*	CTF-001	<b>75</b>
BXM	Brunswick Executive	Local	C-III	3*	CTH-001	<b>75</b>
BXM	Brunswick Executive	Local	C-III	3*	CTG-001	<b>105</b>
BXM	Brunswick Executive	Local	C-III	3*	CTA1-001	<b>150</b>
BXM	Brunswick Executive	Local	C-III	3*	CTA4-001	<b>150</b>
CAR	Caribou Muni	Basic	B-II	2A	CTA-001	35
CAR	Caribou Muni	Basic	B-II	2A	CTA-002	35
OWK	Central Maine Regional	Local	B-II	2A	CTA-001	35
OWK	Central Maine Regional	Local	B-II	2A	CTA-002	35
OWK	Central Maine Regional	Local	B-II	2A	CTA-004	35
OWK	Central Maine Regional	Local	B-II	2A	CTB-002	35
OWK	Central Maine Regional	Local	B-II	2A	CTA-003	<b>43</b>
OLD	Dewitt Fld- Old Town Muni	Local	B-II	1B*	CTA-001	<b>50</b>
OLD	Dewitt Fld- Old Town Muni	Local	B-II	1B*	CTB-001	<b>50</b>
OLD	Dewitt Fld- Old Town Muni	Local	B-II	1B*	CTB-002	<b>50</b>
OLD	Dewitt Fld- Old Town Muni	Local	B-II	1B*	CTB-004	<i>TAPERS 50-150</i>
OLD	Dewitt Fld- Old Town Muni	Local	B-II	1B*	CTB-003	<i>TAPERS 65-140</i>

ID	Airport Name	NPIAS Role	ADG (existing)	TDG (existing)	TW	Existing TW Width (ft)
1B0	Dexter Regional	Local	A-I (small)	1A	CTA-001	25
IZG	Eastern Slope Regional	Local	B-II	2A	PTA-001	40
IZG	Eastern Slope Regional	Local	B-II	2A	CTB-001	40
IZG	Eastern Slope Regional	Local	B-II	2A	CTC-001	40
EPM	Eastport Muni	Basic	B-I	1A*	CTA-002	30
EPM	Eastport Muni	Basic	B-I	1A*	CTA-001	TAPERS 30-145
3B1	Greenville Muni	Basic	B-II	1A*	PTB-001	30
3B1	Greenville Muni	Basic	B-II	1A*	CTA-001	35
3B1	Greenville Muni	Basic	B-II	1A*	CTA-002	TAPERS 35-240
3B1	Greenville Muni	Basic	B-II	1A*	CTA-003	25
3B1	Greenville Muni	Basic	B-II	1A*	CTB-001	50
BHB	Hancock County-Bar Harbor	Local	C-II	2A	PT-01	35
BHB	Hancock County-Bar Harbor	Local	C-II	2A	PT-02	35
BHB	Hancock County-Bar Harbor	Local	C-II	2A	CT-01	35
BHB	Hancock County-Bar Harbor	Local	C-II	2A	CT-02	35
BHB	Hancock County-Bar Harbor	Local	C-II	2A	CT-03	50
BHB	Hancock County-Bar Harbor	Local	C-II	2A	CT-04	35

ID	Airport Name	NPIAS Role	ADG (existing)	TDG (existing)	TW	Existing TW Width (ft)
BHB	Hancock County-Bar Harbor	Local	C-II	2A	CT-05	35
BHB	Hancock County-Bar Harbor	Local	C-II	2A	CT-06	<b>50</b>
BHB	Hancock County-Bar Harbor	Local	C-II	2A	CT-07	35
HUL	Houlton Intl	Local	B-II	2A	CTD-001	35
HUL	Houlton Intl	Local	B-II	2A	PTA-001	<b>50</b>
HUL	Houlton Intl	Local	B-II	2A	PTA-002	<b>50</b>
HUL	Houlton Intl	Local	B-II	2A	PTA-003	<b>50</b>
HUL	Houlton Intl	Local	B-II	2A	PTB-001	<b>50</b>
HUL	Houlton Intl	Local	B-II	2A	PTB-002	<b>50</b>
HUL	Houlton Intl	Local	B-II	2A	CTA-001	<b>50</b>
HUL	Houlton Intl	Local	B-II	2A	CTC-001	<b>60</b>
HUL	Houlton Intl	Local	B-II	2A	CTC-002	<b>58</b>
LRG	Lincoln Regional	Local	B-I (small)	1A	CTA-001	<b>30</b>
MV M	Machias Valley	Basic	A-I	1A*	CTA-001	<b>30</b>
MLT	Millinocket Muni	Local	B-II	1A*	CTA-001	<b>30</b>
MLT	Millinocket Muni	Local	B-II	1A*	CTB-001	<b>35</b>
59B	Newton Field	Basic	B-II	2A	CTA-001	30
FVE	Northern Aroostook Regional	Basic	B-II	2A	CTC-001	35
FVE	Northern Aroostook Regional	Basic	B-II	2A	CTD-001	35

ID	Airport Name	NPIAS Role	ADG (existing)	TDG (existing)	TW	Existing TW Width (ft)
FVE	Northern Aroostook Regional	Basic	B-II	2A	CTD-002	35
FVE	Northern Aroostook Regional	Basic	B-II	2A	CTA-001	<b>40</b>
FVE	Northern Aroostook Regional	Basic	B-II	2A	CTB-001	<b>40</b>
81B	Oxford County Regional	Local	B-I	1A*	CTC-001	20
81B	Oxford County Regional	Local	B-I	1A*	CTB-001	25
81B	Oxford County Regional	Local	B-I	1A*	CTA-001	<b>40</b>
2B7	Pittsfield Muni	Local	B-II	2A	CTA-001	35
2B7	Pittsfield Muni	Local	B-II	2A	CTB-001	35
2B7	Pittsfield Muni	Local	B-II	2A	CTD-001	<b>50</b>
PNN	Princeton Muni	Basic	B-I/B-II	2A*	PPTB-002	35
PNN	Princeton Muni	Basic	B-I/B-II	2A*	PPTB-003	35
PNN	Princeton Muni	Basic	B-I/B-II	2A*	CTC-001	35
PNN	Princeton Muni	Basic	B-I/B-II	2A*	PPTB-001	<i>TAPERS 35-175</i>
PNN	Princeton Muni	Basic	B-I/B-II	2A*	CTA-001	<i>TAPERS 35-175</i>
8B0	Steven A Bean Muni	Basic	A-I (small)/B-II	1A*	CTC-001	<b>30</b>
8B0	Steven A Bean Muni	Basic	A-I (small)/B-II	1A*	CTC-002	<b>30</b>

ID	Airport Name	NPIAS Role	ADG (existing)	TDG (existing)	TW	Existing TW Width (ft)
8B0	Steven A Bean Muni	Basic	A-I (small)/B-II	1A*	CTB-001	35
B21	Sugarloaf Regional	Basic	A-I (small)	1A*	CTA-001	30
B21	Sugarloaf Regional	Basic	A-I (small)	1A*	CTB-001	30
WVL	Waterville-Robert Lafleur	Local	C-II	2B	PTA-001	50
WVL	Waterville-Robert Lafleur	Local	C-II	2B	CTA1-001	55
WVL	Waterville-Robert Lafleur	Local	C-II	2B	CTA2-001	55
WVL	Waterville-Robert Lafleur	Local	C-II	2B	CTA2-002	55
WVL	Waterville-Robert Lafleur	Local	C-II	2B	CTA4-001	55
WVL	Waterville-Robert Lafleur	Local	C-II	2B	CTA3-001	60
WVL	Waterville-Robert Lafleur	Local	C-II	2B	CTA3-002	60
IWI	Wiscasset	Local	B-II	2A	PTA-001	35
IWI	Wiscasset	Local	B-II	2A	CTB-001	35
IWI	Wiscasset	Local	B-II	2A	CTC-001	35
IWI	Wiscasset	Local	B-II	2A	CTC-002	35
IWI	Wiscasset	Local	B-II	2A	CTD-001	40

Source: McFarland Johnson, Inc analysis, 2023.

\* Minimum Taxiway Design Group based on width of Taxiway or Alternative Measurements

Note: PT= Parallel Taxiway/CT = Connecting Taxiway

### Unclassified Airports Taxiway Analysis

The unclassified category of airports are airports that are currently in the NPIAS but currently do not fall under any other category and have limited activity. There are currently three (3) airports that are designated as an unclassified role within the Maine SASP:

- Charles A. Chase Memorial Airport (44B)
- Islesboro Airport (57B)
- Stonington Municipal Airport (93B)

These airports currently have no Masterplan or ALP available; the analysis was performed based on aerial views of the taxiways. 44B currently has a turf taxiway rather than an asphalt, therefore it is not included in the analysis. **Table A-6** highlights in red any instances where a taxiway has been constructed wider than the TDG specifications, indicating potential deviations from the recommended standards.

**Table A-6: Unclassified Airports Taxiway Analysis**

ID	Airport Name	NPIAS Role	ADG (existing)	TDG (existing)	TW	Existing TW Width (ft)
57B	Islesboro	Unclassified	No Master Plan or ALP Available	1B*	CT-01	60
57B	Islesboro	Unclassified	No Master Plan or ALP Available	1B*	CT-02	15
93B	Stonington Muni	Unclassified	No Master Plan or ALP Available	1A*	LOOP	20

Source: McFarland Johnson, Inc analysis, 2023.

\*Minimum Taxiway Design Group based on aerial measurements of the Taxiway

### Taxiway Analysis Summary

The taxiway analysis highlights instances where taxiways have deviated from the recommended TDG specifications, emphasizing areas that may require adjustments or further analysis to enhance safety and efficiency. **Table A-7** is a consolidated list of all the airports that were analyzed. It is recommended that MaineDOT continually evaluate airports whose taxiway widths are wider than the FAA guidelines and work with recommendations in the memo for maintenance plans while taking into consideration the cost factors of the 20-year life cycle. There might not be a perfect fit for all classes of TDG, but acknowledging the critical community access, emergency response and preparedness, reliever classification, and substantial aircraft operational needs for each of the airports, an evaluation of an optimal maintenance investment can be determined.

**Table A-7: Summary of All Airport Taxiway Widths Analyzed**

ID	Airport Name	NPIAS Role	TDG	Width Requirement (ft)	Taxiway Sections Measured	Current Taxiway Sections Widths Wider than FAA TDG Specifications
RKD	Knox County Regional	Commercial Service - Primary	2A	35	1	1
LEW	Auburn/Lewiston Muni	Regional	2A	35	8	2
AUG	Augusta State	Regional	2A	35	12	12
SFM	Sanford Seacoast Regional	Regional	3*	50	13	<b>None</b>
BST	Belfast Muni	Local	1A	25	4	3
OB1	Bethel Regional	Local	2A	35	1	<b>None</b>
BXM	Brunswick Executive	Local	3*	50	3	3
B19	Biddeford Muni	Local	1A	25	1	1
OWK	Central Maine Regional	Local	2A	35	5	1
OLD	Dewitt Fld-Old Town Muni	Local	1B*	25	5	3
1B0	Dexter Regional	Local	1A	25	1	<b>None</b>
IZG	Eastern Slope Regional	Local	2A	35	3	3
BHB	Hancock County-Bar Harbor	Local	2A	35	9	2
HUL	Houlton Intl	Local	2A	35	9	8
LRG	Lincoln Regional	Local	1A	25	1	1
MLT	Millinocket Muni	Local	1A*	25	2	2

ID	Airport Name	NPIAS Role	TDG	Width Requirement (ft)	Taxiway Sections Measured	Current Taxiway Sections Widths Wider than FAA TDG Specifications
81B	Oxford County Regional	Local	1A*	25	3	1
2B7	Pittsfield Muni	Local	2A	35	3	1
WVL	Waterville-Robert Lafleur	Local	2B	35	7	7
IWI	Wiscasset	Local	2A	35	5	4
CAR	Caribou Muni	Basic	2A	35	2	<b>None</b>
EPM	Eastport Muni	Basic	1A*	25	2	1
3B1	Greenville Muni	Basic	1A*	25	5	3
MVM	Machias Valley	Basic	1A*	25	1	1
59B	Newton Field	Basic	2A	35	1	<b>None</b>
FVE	Northern Aroostook Regional	Basic	2A	35	5	2
PNN	Princeton Muni	Basic	2A*	35	5	<b>None</b>
8B0	Steven A Bean Muni	Basic	1A*	25	3	3
B21	Sugarloaf Regional	Basic	1A*	25	2	2
57B	Islesboro	Unclassified	1A*	25	2	1
93B	Stonington Muni	Unclassified	1A*	25	1	1

Source: McFarland Johnson, Inc analysis, 2023.

Minimum Taxiway Design Group based on the width of the Taxiway or alternative measurements

### Taxiway Costs – 20-Year Life Cycle Analysis

The design and construction of taxiways at airports involve numerous considerations, including the width of the taxiway itself. One key factor in taxiway design is the width, as it directly impacts the cost and feasibility of the project. While narrower taxiways may seem appealing due to potential cost savings, it is crucial to assess the trade-offs between cost and functionality. This technical memo aims to examine the 20-year life cycle analysis per square foot of taxiway pavement. By understanding the cost implications associated with the pavement lifecycle, airport



planners and stakeholders can make informed decisions regarding taxiway design, ensuring the optimal balance between affordability and functionality in airport infrastructure development to determine criteria for the state to maintain taxiway dimensions that exceed their TDG.

Using the Magnitude of Cost established from the *MaineDOT Magnitude of Costs* Technical Memo, a subject 300ft taxiway was assumed to have approximately \$22/sf for initial installation costs. Several maintenance approaches were analyzed for a taxiway with a nominal width of 25ft and 35ft. A full breakdown of the estimated cost for each of the methodologies can be found in **Attachment A**.

**Maintenance Approach #1** – This method utilizes crack sealing every two (2) years interluded with a surface seal at year 10 and crack repair at year 16 for repairs of cracks too large for sealant for the 20-year life cycle. Manufacturers recommend crack sealing every two (2) years and surface sealing every seven (7) years. The estimated costs for the 25 ft and 35 ft width are \$430,425 and \$602,595, respectively. Maintenance cost for the additional width of a 35 ft taxiway is estimated at \$172,170.

**Maintenance Approach #2** – This method utilizes crack sealing every five (5) years and then applies a surface sealant at year 10 and crack repair at year 15. Although the manufacturer recommends a crack seal every two (2) years, the amount of sealing becomes more costly than beneficial. This method demonstrates a less expensive alternative to sealing every two years. The estimated costs for the 25ft and 35 ft width are \$385,425 and \$539,595, respectively. Maintenance cost for the additional width of a 35ft taxiway is estimated at \$154,170.

**Maintenance Approach #3** – This method utilized crack sealing every five (5) years and then a mill and overlay of the pavement every 10 years. This provides a newly finished surface at a lower cost than reconstruction but degrades quicker as the underlying conditions begin to reflect through the overlay material. The greatest benefit of this approach is its applicability to expand over two (2) 20-year lifecycles. The largest impact on cost-saving measures can be realized in the 2<sup>nd</sup> 20-year lifecycle (Year 21 – Year 40). It is not likely that this approach would last beyond a 40-year life cycle before the underlying layers require rehabilitation. For the 1<sup>st</sup> 20-year life cycle (year 1 – year 20) the estimated cost for the 25ft and 35 ft width are \$355,500 and \$497,700, respectively. Maintenance cost for the additional width of 35 ft is estimated at \$142,200 and no reclamation of the taxiway is recommended. In the 2<sup>nd</sup> 20-year life cycle (Year 21 – Year 40) the estimated cost for the 25ft and 35ft width are \$276,000 and \$386,400, respectively. Maintenance cost for the additional width of the 35ft taxiway is estimated at \$110,400.

**Maintenance Approach #4** – This method applies a crack seal every five (5) years and a surface sealant every seven (7) years per manufacturer’s recommendations and a mill and overlay at year 20. In theory, the age inhibitor eliminates the need for crack repair and would result in a pavement condition that would enable a mill and overlay after 20 years. Although there are cost savings in the 1<sup>st</sup> 20-year life cycle (Year 0 – Year 20), the true cost savings are realized in the 2<sup>nd</sup> 20-year cycle (Year 21 – Year 40). Similar to the mill and overlay option, this cycle will not likely extend beyond 40 years. For the 1<sup>st</sup> 20-year life cycle the estimated cost for the 25ft and 35 ft width are \$278,850 and \$390,390, respectively. Maintenance cost for the additional width of 35 ft is estimated at \$111,540 and no reclamation of taxiway is recommended. In the 2<sup>nd</sup> 20-year life cycle,

the estimated cost for the 25ft and 35ft width are \$199,350 and \$279,090, respectively. The maintenance cost for the additional width of 35ft is estimated at around \$79,740.

### Summary of Maintenance Approach Cost Analysis

In contrast, crack sealing every two (2) years versus every five (5) years between maintenance approach 1 and maintenance approach 2, demonstrates a notable cost benefit to crack sealing less frequently. Specifically, 25ft taxiways save an estimated \$45,000, 35ft taxiways save an estimated \$63,000, and maintenance cost for the additional width of a 35ft taxiway saves an estimated \$18,000.

For the 1<sup>st</sup> 20-year lifecycle (Year 0 – Year 20) for each of the pavement approaches, the most cost-effective maintenance approach is maintenance approach #4. This is due to its lower cost of surface sealant every seven (7) years and mill and overlay at year 20 versus the higher cost of mill and overlay every 10 years (maintenance approach #3) in combination with crack seal every five (5) years. By maintaining the surface in better condition and reducing the amount of surface cracking, the underlying layers are preserved.

The real cost benefits can be seen in the 2<sup>nd</sup> 20-year lifecycle in comparison to the 1<sup>st</sup> 20-year lifecycle. For maintenance approach #3, the estimated cost savings for a 25 ft width was \$29,925, and for a 35ft width \$41,895. For maintenance approach #4, the estimated cost saving for 25ft was \$79,500, and for 35ft was \$111,300. That 2<sup>nd</sup> 20-year life cycle was close to 30% less in costs in comparison to the 1st 20-year lifecycle. **Table A-8** details the comparison between the four (4) different maintenance approaches and their lifecycle cost analysis.

**Table A-8: Maintenance Approach Comparison – 20-Year Lifecycle Cost Analysis**

Maintenance Approach	Maintenance Approach #1	Maintenance Approach #2	Maintenance Approach #3	Maintenance Approach #4
<b>Methodology</b>	This method utilizes crack sealing every two (2) years interluded with a surface seal at year 10 and crack repair at year 16	This method utilizes crack sealing every five (5) years interluded with a surface seal at year 10 and crack repair at year 15	This method utilizes crack sealing every five (5) years, a mill and overlay every 10 years	This method utilizes crack sealing every five (5) years, surface sealant every 7 years, and a mill and overlay at year 20.
<b>Maintenance Cost 1st 20-Year Lifecycle (Year 0 - Year 20)</b>	\$430,425 (25ft) \$602,595 (35 ft)	\$385,425 (25 ft) \$539,595 (35 ft)	\$355,500 (25 ft) \$497,700 (35 ft)	\$278,850 (25 ft) \$390,930 (35 ft)
<b>1st 20-Year Lifecycle Cost Comparison Across All Maintenance Approaches</b>	High Cost	Medium Cost	Medium – Low Cost	Low Cost
<b>Maintenance Cost 2nd 20-Year Lifecycle (Year 21 - Year 40)</b>	\$430,425 (25ft) \$602,595 (35 ft)	\$385,425 (25 ft) \$539,595 (35 ft)	\$276,000 (25 ft) \$386,400 (35 ft)	\$199,350 (25 ft) \$279,090 (35 ft)
<b>2nd 20-Year Lifecycle Cost Comparison Across All Maintenance Approaches</b>	No Savings	No Savings	Reduced cost \$29,925 (25ft) \$41,895 (35ft)	Reduced cost \$79,500 (25ft) \$111,300 (35ft)

Source: McFarland Johnson, Inc analysis, 2023.

The challenge with recommending any method as the preferred method is the challenge of consistent leadership over 40 years. This is a substantial timeframe and a lot can happen on a global scale that can disrupt the diligence required to maintain the asphalt. However, the application of a surface sealant per the manufacturer’s recommendations would likely extend the life of the pavement and the System would benefit even if it resulted in a partial life cycle.

## Summary

The taxiway analysis offers insights into the right-sizing of airports. Analysis has been provided to help guide MaineDOT in the best path forward identifying airports that need taxiway assessments through the master planning process and with a 20-year life cycle analysis to estimate maintenance and replacement costs.

It is recommended that MaineDOT employ a comprehensive taxiway maintenance strategy that aligns with the right-size of airports and encourages access throughout the State. Taxiway management implementation strategies should not solely be based on the designated Taxiway Design Group (TDG) based on regular use, but also give credence to factors such as NPIAS service roles, essential functions, and larger-size aircraft access. It is recommended that Airports have at least one (1) path for larger aircraft to exit the runway safely, that is at least one (1) class higher than the designated TDG width. MaineDOT can make informed decisions towards optimal efforts associated with different taxiway widths at airports throughout the State to ensure continued access to the safe and efficient operation of the State's aviation network while allocating resources accordingly.

During the master planning process, MaineDOT needs to ensure that the TDG is identified and justified. MaineDOT also needs to define essential functions and evaluate the importance of larger aircraft operations to the surrounding community on a case-by-case basis in order to determine the degree of financial support to participate in the ineligible work.

### Attachment A – Maintenance Approach 20–Year Life Cycle

Maintenance Approach #1 – Crack Seal Every 2 Years		
Assume 300 Foot Taxiway	Taxiway Width	
Analysis in 2022 Dollars	25ft	35ft
Initial Construction	\$ 165,000.00	\$ 231,000.00
Year 1		
Crack Seal Year 2	\$ 1,500.00	\$ 2,100.00
3		
Crack Seal Year 4	\$ 3,000.00	\$ 4,200.00
5		
Crack Seal Year 6	\$ 4,500.00	\$ 6,300.00
7		
Crack Seal Year 8	\$ 6,000.00	\$ 8,400.00
9		
Crack & Surface Seal Year 10	\$ 10,425.00	\$ 14,595.00
11		
Crack Seal Year 12	\$ 9,000.00	\$ 12,600.00
13		
Crack Seal Year 14	\$ 10,500.00	\$ 14,700.00
15		
Crack Repair & Seal Year 16	\$ 42,000.00	\$ 58,800.00
17		
Crack Seal Year 18	\$ 13,500.00	\$ 18,900.00
19		
Reclaim Taxiway 20	\$ 165,000.00	\$ 231,000.00
<b>TOTAL COSTS</b>	<b>\$ 430,425.00</b>	<b>\$ 602,595.00</b>
Per SF Costs	\$ 57.39	\$ 57.39
25' vs. 35' TW SF Difference	3,000	SF
	<b>ADDITIONAL COSTS</b>	<b>\$ 172,170.00</b>

Source: McFarland Johnson, Inc analysis, 2023.

Maintenance Approach #2 - Crack Seal & Repair		
Assume 300 Foot Taxiway	Taxiway Width	
Analysis in 2022 Dollars	25ft	35ft
Initial Construction	\$ 165,000.00	\$ 231,000.00
Year 1		
2		
3		
4		
Crack Seal Year 5	\$ 3,000.00	\$ 4,200.00
6		
7		
8		
9		
Crack & Surface Seal Year 10	\$ 10,425.00	\$ 14,595.00
11		
12		
13		
14		
Crack Repair & Seal Year 15	\$ 42,000.00	\$ 58,800.00
16		
17		
18		
19		
Reclaim Taxiway 20	\$ 165,000.00	\$ 231,000.00
<b>TOTAL COSTS</b>	<b>\$ 385,425.00</b>	<b>\$ 539,595.00</b>
Per SF Costs	\$ 51.39	\$ 51.39
25' vs. 35' TW SF Difference	3,000	SF
	<b>ADDITIONAL COSTS</b>	<b>\$ 154,170.00</b>

Source: McFarland Johnson, Inc analysis, 2023.

Maintenance Approach #3 - Mill & Overlay Every 10 Years (Year 1 – Year 20)		
Assume 300 Foot Taxiway	Taxiway Width	
Analysis in 2022 Dollars	25ft	35ft
Initial Construction	\$ 165,000.00	\$ 231,000.00
Year 1		
2		
3		
4		
Crack Seal Year 5	\$ 3,000.00	\$ 4,200.00
6		
7		
8		
9		
Mill & Overlay Year 10	\$ 90,000.00	\$ 126,000.00
11		
12		
13		
14		
Crack Seal Year 15	\$ 7,500.00	\$ 10,500.00
16		
17		
18		
19		
Mill & Overlay Year 20	\$ 90,000.00	\$ 126,000.00
<b>TOTAL COSTS</b>	<b>\$ 355,500.00</b>	<b>\$ 497,700.00</b>
Per SF Costs	\$ 47.40	\$ 47.40
25' vs. 35' TW SF Difference	3,000	SF
	<b>ADDITIONAL COSTS</b>	<b>\$ 142,200.00</b>

Source: McFarland Johnson, Inc analysis, 2023.

Maintenance Approach #3 - Mill & Overlay Every 10 Years (Year 21 – Year 40)		
Assume 300 Foot Taxiway Analysis in 2022 Dollars	Taxiway Width	
	25ft	35ft
Initial Construction	Continuation of Mill & Overlay	
Year 21		
22		
23		
24		
Crack Seal Year 25	\$ 9,000.00	\$ 12,600.00
26		
27		
28		
29		
Mill & Overlay Year 30	\$ 90,000.00	\$ 126,000.00
31		
32		
33		
34		
Crack Seal Year 35	\$ 12,000.00	\$ 16,800.00
36		
37		
38		
39		
Reclaim Taxiway 40	\$ 165,000.00	\$ 231,000.00
<b>TOTAL COSTS</b>	<b>\$ 276,000.00</b>	<b>\$ 386,400.00</b>
Per SF Costs	\$ 36.80	\$ 36.80
25' vs. 35' TW SF Difference	3,000	SF
	<b>ADDITIONAL COSTS</b>	<b>\$ 110,400.00</b>

Source: McFarland Johnson, Inc Analysis, 2023



<b>Maintenance Approach #4 - Surface and Crack Seal (Year 1 – Year 20)</b>		
<b>Assume 300 Foot Taxiway</b>	<b>Taxiway Width</b>	
<b>Analysis in 2022 Dollars</b>	25ft	35ft
Initial Construction	\$ 165,000.00	\$ 231,000.00
Year 1		
2		
3		
4		
Crack Seal Year 5	\$ 3,000.00	\$ 4,200.00
6		
Surface Seal Year 7	\$ 2,925.00	\$ 4,095.00
8		
9		
Crack Seal Year 10	\$ 6,000.00	\$ 8,400.00
11		
12		
13		
Surface Seal Year 14	\$ 2,925.00	\$ 4,095.00
Crack Seal Year 5	\$ 9,000.00	\$ 12,600.00
16		
17		
18		
19		
Mill & Overlay Year 20	\$ 90,000.00	\$ 126,000.00
<b>TOTAL COSTS</b>	<b>\$ 278,850.00</b>	<b>\$ 390,390.00</b>
Per SF Costs	\$ 37.18	\$ 37.18
25' vs. 35' TW SF Difference	3,000	SF
	<b>ADDITIONAL COSTS</b>	<b>\$ 111,540.00</b>

Source: McFarland Johnson, Inc analysis, 2023.

<b>Maintenance Approach #4 - Surface and Crack Seal (Year 21 – 40)</b>		
<b>Assume 300 Foot Taxiway</b>	<b>Taxiway Width</b>	
<b>Analysis in 2022 Dollars</b>	25ft	35ft
Initial Construction	Continuation of Mill & Overlay	
Year 21		
22		
23		
24		
Crack Seal Year 25	\$ 7,500.00	\$ 10,500.00
26		
Surface Seal Year 27	\$ 2,925.00	\$ 4,095.00
28		
29		
Crack Seal Year 30	\$ 9,000.00	\$ 12,600.00
31		
32		
33		
Surface Seal Year 34	\$ 2,925.00	\$ 4,095.00
Crack Seal Year 35	\$ 12,000.00	\$ 16,800.00
36		
37		
38		
39		
Reclaim Taxiway 40	\$ 165,000.00	\$ 231,000.00
<b>TOTAL COSTS</b>	<b>\$ 199,350.00</b>	<b>\$ 279,090.00</b>
Per SF Costs	\$ 26.58	\$ 26.58
25' vs. 35' TW SF Difference	3,000	SF
	<b>ADDITIONAL COSTS</b>	<b>\$ 79,740.00</b>

Source: McFarland Johnson, Inc analysis, 2023.



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## MEMORANDUM

**TO:** Maine Department of Transportation  
**FROM:** McFarland Johnson, Inc.  
**DATE:** April 25, 2023  
**SUBJECT:** Low-Competing/High-Cost Projects  
**PROJECT NO.:** MaineDOT WIN: 018717.03; MJ#19008.00

### Introduction

When funding requests exceed available funding, the Federal Aviation Administration (FAA) prioritizes projects based on its National Priority Ranking system. Projects that do not compete well may not receive funding even if eligible and justified within the program. To anticipate the magnitude of these low-competing, yet high-cost projects, projected project costs were consolidated from FY2022-2029 Airport Capital Improvement Programs (ACIPs), as well as the 2020 "FACE" of Maine Aviation – Airport Manager Surveys. However, due to the date of this analysis, 2022 projects were excluded because they were already completed. Data from historical airport grant awards were reviewed to project future facility investments beyond the FY2029 to 2042 which is the extent of this aviation system planning period. This memo documents the analyses of these cost estimates and creates a basis for potential funding needs.

While these data sources provide valuable insights into the costs of airport facility development, there are some limitations to consider:

- The ACIPs only cover airport plans up to 2029, which means that the long-term costs of some projects may not be fully captured in this analysis.
- The information provided by the Airport Manager Surveys is somewhat outdated, and further changes in market conditions and other factors will continue to impact the accuracy of these cost estimates over time.

Despite these limitations, given the significant level of variability in cost estimates since the beginning of the COVID-19 pandemic, this approach is reasonable and provides a valuable starting point for estimating the costs of low-competing airport facility development moving forward. By identifying the proposed facility development and associated costs early, the

allocation of resources can be utilized more effectively to better address potential funding shortfalls at airports in the future.

The 20-year cost projection was developed based on the review of proposed projects for each public-use airport within Maine presented in their individual ACIPs. Several assumptions and planning-level costing approaches are noted as follows:

- ACIP cost estimates are reasonably accurate and represent future year costs.
- Beyond the 2023 – 2029 ACIP window, with 2042 being the System Plan time horizon, costs were projected at an annual compound rate to illustrate project costs if MaineDOT and sponsors were to not complete the projects within the original timeframe.
- The escalation also attempts to account for inevitable projects that will be programmed by sponsors in the next 13 years.
- Terminal facilities programmed represent the eligible costs within the project.
- Primary commercial service airports (Bangor International Airport (BGR), Knox County Regional Airport (RKD), Portland International Jetport (PWM), and Presque Isle International (PQI)) were not included in the analysis due to their ability to develop revenue through Passenger Facilities Charges and other non-aeronautical revenue streams.
- Mowing equipment and replacement of fuel systems is not eligible in the AIP program but is a documented need identified in Phase 1 of the State Aviation System Plan.

A consolidation of the data and projected costs are displayed in **Table A-1** Projected Low-Competing Project Costs Over 20 Years below:

**Table A-1: Projected Low-Competing Project Costs Over 20 Years\***

Project Category	# Anticipated Projects (2023 – 2029)	2023 – 2029 ACIP Project Costs	Projecting 2042 @ 5% (Building) & 3% (Equipment)
Terminal**	19	\$31,597,572	\$59,581,935
Snow Removal Equipment (SRE) Buildings**	5	\$5,467,000	\$10,308,844
Hangars**	11	\$8,045,867	\$15,171,682
Snow Removal Equipment (SRE)***	12	\$5,608,000	\$8,235,537
Mowing Equipment***	7	\$875,700	\$1,077,000
Fuel Farms***	3	\$855,500	\$7,283,927
<b>Total</b>	<b>62</b>	<b>\$52,449,639</b>	<b>\$101,658,925</b>

Source: McFarland Johnson, Inc, analysis, 2023.

\* Base costs derived from 2022 values

\*\*Building Construction – compounding yearly 5% projected cost

\*\*\*Equipment Purchases – compounding yearly 3% projected cost

The 2023 - 2029 ACIP identifies the total number of projects for terminals, SRE buildings, and hangar facilities. The value for each project category was conducted by summing the expenses of all the scheduled projects within the given timeframe. To determine the projected costs, the project categories were classified as either equipment purchases or construction. The purchase costs were estimated to increase at an annual rate of 3%, while the construction costs were

estimated to rise at a higher rate of 5%. The higher inflation rate for construction costs was due to the surge in labor and building material costs.

The results of the analysis show that with 62 projects scheduled within the 6-year ACIP window, there is a documented need for approximately \$52,449,639, and a funding request to allocate approximately \$47,204,675 of AIP funding (90% of eligible costs) in order to maintain these scheduled airport developments. A significant amount of the 20-year cost estimate (91.8%) is dedicated to the construction or renovations of terminal facilities, hangars, SRE, and SRE buildings which are all eligible for AIP funding. Mowing equipment and fueling system replacements represent 8.2% of the cost estimates and are currently ineligible for AIP funding.

The largest share of projected 20-year funding for projects falls in the terminal construction category at 60.2%. The aging of the terminal facilities is posed to present a future infrastructure challenge within the System. Of the 27 airports whose terminal facilities are on average 41 years old, only seven (7) of these facilities were rehabilitated or reconstructed within the past 15 years. These projects, large in scale and phased over multiple years, can become costly to the System as they fall low in the ranking for AIP funding. Terminal facilities are essential for the functionality of the airport in providing services for users, operators and the general public. MaineDOT recognizes the sponsors are in the best position to understand unique terminal configurations and service requirements for each airport. Based on the Phase I summary recommendations, it is advised that sponsors take the responsibility of creating a business plan identifying the terminal needs of the Airport and seek alternative funding sources to close the funding gaps and include these efforts as a part of their master planning process.

Hanger construction is attributable to 14.9% of the projected 20-year funding costs. Hangers are critical infrastructure and economic drivers for multiple airports across the System. All 35 airports within the System have at least one (1) hanger at their facility with the largest number of hangers being 86 at Sanford Seacoast Regional Airport (SFM). In the Phase I summary recommendations, the responsibility of bridging the funding gap should be sponsor-driven. It is recommended that sponsors develop a business minded practices and work with local and private organizations to help fulfill the need of the funding shortfalls whether it's through leasing, private development initiatives, or directly sponsor funding to generate additional revenue streams for the airport.

Snow Removal Equipment (SRE) buildings are key to the maintenance of the SRE at airports. If a storage facility or shelter begins to fail, the equipment can be negatively impacted, and the lifespan of the equipment can decrease exponentially. During Phase I, one of the top priorities and widely supported issues across the State Aviation System Plan (SASP) was snow removal, which is inclusive of both the available equipment and snow removal plans facing the various challenges airports encounter in managing different weather conditions on the airfield. As the SRE buildings contribute to SRE equipment longevity, it is recommended that MaineDOT work with sponsors to maintain current SRE storage facilities and collaborate on addressing funding gaps before these facilities reach their useful life expectancy. There are currently 18 airports that have SRE facilities, whose age on average is approximately 18 years old, with the oldest being 31 years old. 10.1% of the projected 20-year funding costs are attributable to SRE building rehabilitation or reconstruction.

The Airport Manager Surveys revealed that vegetation management and snow removal are major challenges for airports. To address this, significant portions of airport budgets will be allocated to updating mowing and snow removal equipment in the next decade, including the purchase of tractors, snowplows, sand spreaders, and carrier vehicles.

SRE equipment purchases are anticipated to be 10.7% of the projected 20-year funding costs. The age of SRE equipment across the System equipment ranges from 4 years to 36 years old with an average age of 19 years. Because snow removal equipment varies in features, quality, and condition, it is difficult to predict when new equipment is needed versus when it is simply eligible. Therefore, this analysis assumes that the sponsors know their equipment best and have programmed the necessary upgrades in their CIP. Funding needs were developed by summing up all scheduled purchases within this timeframe for the project category. However, to ensure long-term financial planning, the estimated costs were projected to increase annually by 3% through 2042 to account for additional needs and delays in procurement.

Mowing equipment purchases are projected to be 1.6% of the estimated funding costs. Although it is the lowest portion of the funding costs, mowing equipment is ineligible for AIP funding and therefore the full costs fall onto the State and the sponsor.

Very little data exists on mowing equipment purchases, therefore a custom approach to calculating costs was developed. The basis is as follows:

- It is reasonable to assume that each airport would have a tractor with a tow-behind wing mower for expansive areas; along with a zero-turn mower to address tight areas and around lights and signs.
- An August 2019 quote indicated that the new tractor and a tow-behind wing mower could cost \$101,000. This value was escalated by 15.44% to approximately \$116,600 in 2022 dollars per the US Bureau of Labor and Statistics. Current pricing of commercial-grade zero-turn mowing equipment ranges from \$5,000 to \$10,000 and assumed \$8,500 for budgeting purposes and was included in the total cost estimate. It was estimated that the total cost for a new tractor, tow-behind mower, and grade zero turn equipment to equal \$125,100 in 2022 dollars.
- Based on the 2020 "FACE" of Maine Aviation – Airport Manager Surveys, seven (7) of the 35 airports reported issues with maintaining grass and vegetation. It is assumed that these airports will invest in mowing equipment within the 2023 – 2029 ACIP timeline.
- Allocating the estimated equipment costs over seven (7) airports resulted in approximately \$875,700 for various equipment between 2023 - 2029.
- \$875,700 was escalated by 3% per year to project a \$1,285,995 cost by 2042.

The historical grant data available for airports provided valuable insight into the types and timing of fuel farm conditions. Fuel farms are expected to be upgraded or placed at most airports in Maine over the next 20 years attributing to 6.6% of the projected 20-year funding costs. The data indicates that 12 of Maine's public-use airports have either constructed or upgraded their fuel farm storage within the past ten (10) years. However, continued upkeep and maintenance of these facilities will be required in order to maintain compliance as well as ensure revenue generation.

- Of the 35 airports within Maine, 12 airports utilized AIP funding to develop fuel farms.
- Of those 12 airports, three (3) have upcoming projects listed on their CIPs.
- It is assumed that the maximum facility life span is 20 years therefore, eight (8) airports will require a full replacement during the 2042 planning period. It is assumed that a full replacement of a fuel farm facility costs approximately \$570,000.
- Any facilities that are 10 years or older should assume some level of maintenance to the magnitude of \$50,000. Maintenance projects include but are not limited to fuel line/pump replacement, card reader repair/replacement, and hose replacement. Eight (8) airports are expected to require some form of maintenance to their fuel farms within the next 10 years.
- Future costs were identified by reviewing grant history to determine which airports will need maintenance or complete system replacements within the 2042 System Plan timeframe. The future costs were determined in 2022 dollars and escalated by 3% to represent cost in 2042.

The cost estimate for the low-competing/high-cost airport projects has been forecasted for a 20-year period, but it's essential to note that the CIPs and the data provided by airport managers only cover the proposed projects from 2023 to 2029. Unfortunately, as funding requests exceed funding levels, the FAA is unlikely to fund these high-cost, low-competing projects. As a result, MaineDOT must prepare to support potential sponsors with the impending costs, which will require alternative funding sources within the given timeframe. This memo has identified the need and will require MaineDOT to take action to develop a strategic approach to address the potential funding gap.



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## MEMORANDUM

**TO:** Maine Department of Transportation  
**FROM:** McFarland Johnson, Inc.  
**DATE:** May 1, 2023  
**SUBJECT:** Financial Stability of Maine Airports and Surrounding Communities  
**PROJECT NO.:** MaineDOT WIN# 018717.03; MJ#19008.00

### Introduction

The State of Maine, through its Department of Transportation (MaineDOT), has tasked McFarland Johnson, Inc. (MJ) with aviation system planning services for the development of a State Aviation System Plan (SASP). This technical memorandum outlines the financial stability of cities and towns in Maine with airports. The intent is to provide the MaineDOT with information about the financial responsibility that cities and towns assume to support their local airport.

The State of Maine is home to 35 airports: Five (5) categorized by the Federal Aviation Administration (FAA) as commercial service and 30 categorized as general aviation (GA). The FAA further divides GA airports into four (4) categories: Basic, Local, Regional, and National. In general, commercial service airports have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service. The markets served by GA airports vary by size and category, however, all GA airports provide services such as emergency response, air ambulance service, flight training, and personal flying. Therefore, it can be inferred that all public airports serve their surrounding communities.

### Analysis

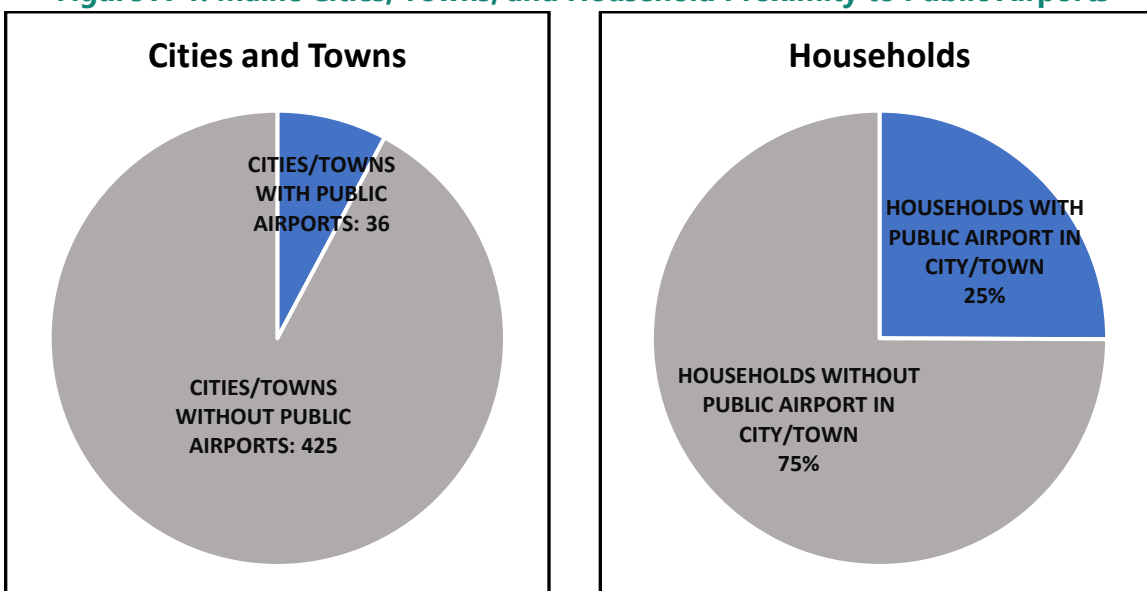
Public airports in the state of Maine were analyzed to determine the financial implications on cities and communities responsible for funding the 5 percent local match at airports. There are 36 cities and towns in Maine with a public airport completely or partially located within its borders. These cities and towns capture approximately 25 percent of households in the state, most paying local taxes that support their respective airport. **Figure A-1** breaks out the ratio of the proximity of public airports to cities, towns, and households across the State of Maine.

Although residential and commercial tax strategies differ per municipality, an analysis was performed to determine the per-household tax increase that would be required to fully fund the local match for each airport's Capital Improvement Plan (CIP) with tax dollars from the city or town in which it resides. It was found that the required annual per-household tax varied from \$12 to



just under \$800, with nearly half over \$100. There was no trend found between the type of airport and the required annual per-household tax revenue.

**Figure A-1: Maine Cities, Towns, and Household Proximity to Public Airports**



Source: McFarland Johnson, Inc analysis, 2023.  
Year: 2021

The average property tax rate in Maine currently hovers around one percent (1 percent). While a tax increase of \$100 dollars annually doesn't seem significant at first glance, it can translate to an increase of nearly 10 percent over the current property taxes. With 11.5 percent (US Census Bureau 2021) of the population in the State of Maine living below the poverty line, 27 of the 35 communities exceed the state average poverty level. The required household tax increase as well as the percent increase to the existing household tax percentage are illustrated in **Table A-1** below.

**Table A-1: Tax Per Household Required for Local Funding Match and Poverty Rate by City**

City/Town	Tax Increase Per Household	Annual Property Tax Percentage Per Household	Poverty Rate
Machias	\$786.09	60%	33.7%
Millinocket	\$364.62	32%	17.6%
Portland	\$354.85	8%	11.8%
Norridgewock	\$313.41	16%	21.9%
Fryeburg	\$282.96	11%	9.7%
Presque Isle	\$211.05	13%	15.9%
Frenchville	\$210.04	17%	12.5%
Bangor	\$190.34	9%	16.1%

City/Town	Tax Increase Per Household	Annual Property Tax Percentage Per Household	Poverty Rate
Bar Harbor*	\$187.75	4%	10.1%
Rockland*	\$187.55	8%	14.0%
Princeton	\$145.46	10%	20.2%
Brunswick*	\$145.30	4%	8.2%
Greenville	\$125.25	5%	7.5%
Augusta*	\$123.97	7%	19.3%
Pittsfield	\$110.84	6%	19.4%
Eastport	\$105.49	5%	15.2%
Wiscasset	\$96.47	3%	11.7%
Belfast	\$87.67	3%	18.8%
Carrabassett	\$78.15	3%	2.5%
Rangeley	\$74.83	2%	2.4%
Jackman	\$72.72	4%	13.3%
Oxford*	\$70.59	3%	14.1%
Dexter	\$47.16	2%	14.0%
Lincoln	\$47.15	3%	16.2%
Bethel	\$46.56	2%	22.9%
Sanford	\$40.51	2%	9.5%
Houlton	\$38.50	5%	23.1%
Old Town	\$37.77	2%	21.2%
Auburn**	\$27.42	1%	11.1%
Biddeford	\$21.11	1%	13.3%
Caribou	\$18.64	1%	13.8%
Lewiston**	\$12.68	1%	16.3%
Waterville	\$12.75	1%	23.1%

Source: McFarland Johnson, Inc analysis, 2023, 2020 US Census, 2021 US Census, 2021 American Community Survey.

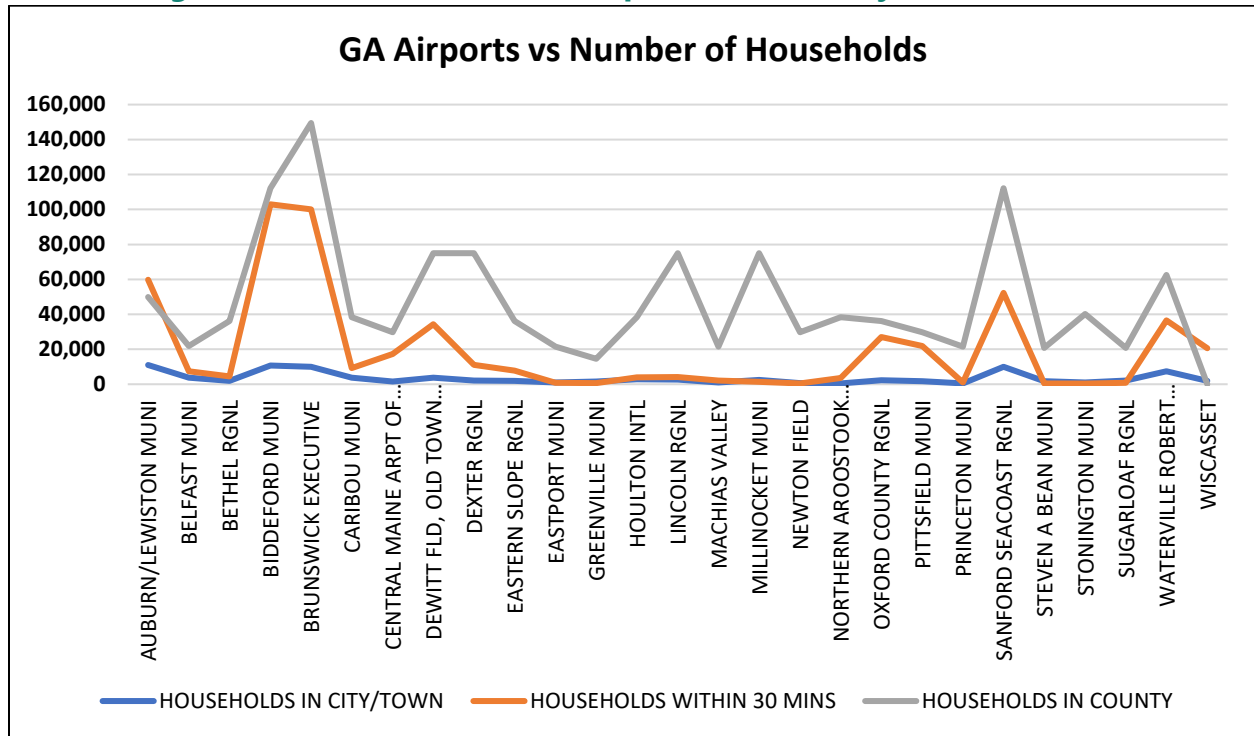
\*Funded by regional authorities such as state, county, and Midcoast Regional Redevelopment Authority (MRRRA)

\*\*The cities of Auburn and Lewiston split the local share 50 percent, however Lewiston has more households than Auburn.

The reach of airport service extends to surrounding cities, towns, and communities and an industry standard is to assume a 30-minute drive time as the service area for General Aviation (GA) airports.

An analysis was performed to determine the approximate number of households located within a 30-minute drive of GA airports. Commercial service airports were excluded from this analysis due to their substantial access to funding sources in comparison to GA airports. The results of this analysis are identified by the orange line indicating the number of households within a 30-minute drive of GA airports in **Figure A-2** below.

**Figure A-2: General Aviation Airports in Proximity to Households**



Source: McFarland Johnson, Inc analysis, 2023.

It is apparent from this graph that surrounding cities and towns have access to the public GA airports in Maine. Because neighboring cities and towns benefit from these airports, it would be reasonable to collect tax revenue from neighboring towns. However, the effort associated with this coordination would likely exceed the benefit of the potential tax dollars.

Regional authorities have proven extremely effective in the State of Maine. Midcoast Regional Redevelopment Authority has revitalized the Brunswick Executive Airport and the Eastern Slope Airport Authority (although not a true authority, but a non-profit organization) has managed Fryeburg sustainably. These organizations take time to establish and manage. Therefore, the analysis pivoted to the county government jurisdiction since there is an existing system established for taxation on a regional level and several airports are currently operated by county government setting a precedence that county taxation to fund airports is acceptable.

An additional analysis was performed to determine the approximate number of households located within the county in which the GA airports reside. The results of the analysis are identified by the gray line in **Figure A-2**.

Counties, as described by the Maine County Commissioners Association (MCCA), provide the vital role of operating at the regional level between municipalities and states. Additionally, counties

play an important role in organizing, overseeing, and delivering public health services to the state. Because airports provide access to communities, emergency response, and air-ambulance services, counties should have an investment in their continuing prosperity. As illustrated in **Figure A-2**, the initiation of tax revenue from counties would provide an increased household tax base to pull from, and therefore decrease the per-household tax requirement. **Table A-3** shows the approximate annual per-household tax that would be required from residents in the counties with airports located within their limits.

**Table A-3: Annual Increase of Per Household Tax Within Close Proximity to Airports by County**

County	Annual Tax Increase Per Household
Kennebec	\$1.51
York	\$5.59
Franklin	\$6.30
Lincoln	\$7.47
Aroostook	\$7.54
Cumberland	\$9.69
Piscataquis	\$13.03
Waldo	\$15.00
Penobscot	\$17.24
Oxford	\$21.57
Androscoggin	\$23.87
Somerset	\$24.38
Washington	\$46.78

Source: McFarland Johnson, Inc analysis, 2023.

With the exception of Washington County, which includes the added burden of funding a new runway at Machias, the required annual revenue from each household in each of the above counties would be less than twenty-five dollars to fund the 5 percent local match of CIPs for all GA airports.

The request for tax revenue for airports will likely need to overcome resistance from the counties. A discussion with Washington County representatives during Phase I of the Maine State Aviation System Plan (SASP) identified that there was little interest in taking on the added burden of the three airports. Some counties, including Penobscot, Somerset, and Washington, will add the burden of three or more GA airports within their borders. Additionally, counties may be hesitant to provide funding as GA airports do not provide a strong source of revenue to the community. In addition to the economic impact statements being developed in Phase II of the MSASP, emphasis should be placed on the functions and benefits that may be more difficult to measure: GA airports provide access to life-saving services, provide transportation connectedness for visitors, and critical community access to residents.



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## MEMORANDUM

**TO:** Maine Department of Transportation  
**FROM:** McFarland Johnson, Inc  
**DATE:** February 7, 2023  
**SUBJECT:** Purchasing Power of \$150,000  
**PROJECT NO.:** MaineDOT WIN# 018717.03; MJ# 19008.00

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### Introduction

The State of Maine, through its Department of Transportation (MaineDOT), has tasked McFarland Johnson, Inc. (MJ) with aviation system planning services for the development of a State Aviation System Plan (SASP). This memorandum aims to provide insight into the FAA Airport Improvement Program (AIP) nonprimary entitlement grant program and the purchasing power of one hundred fifty thousand dollars (\$150,000).

### Background Information

The formation of the AIP was originally established under the Airport and Airway Improvement Act of 1982 to support airport infrastructure, safety, and capacity needs through annual grants. Sponsors can receive AIP funds for most airfield capital improvements or rehabilitation projects and in some specific situations, for terminals, hangars, and nonaviation development. Certain professional services that are necessary for eligible projects (such as planning, surveying, and design) can also be eligible.

The Wendell H. Ford Aviation Investment and Reform Act of the 21<sup>st</sup> Century (AIR-21), enacted in 2000, increased the State Apportionment to the lesser of 20 percent of the airport's 5-year capital needs or \$150,000 when at least \$3.2 Billion in AIP funding is available<sup>1</sup>. This number has remained the same since its establishment over 20 years ago. This memorandum summarizes the impact of the reduced purchasing power of \$150,000 and provides recommendations for how MaineDOT can keep up with the rising costs of planning and development.

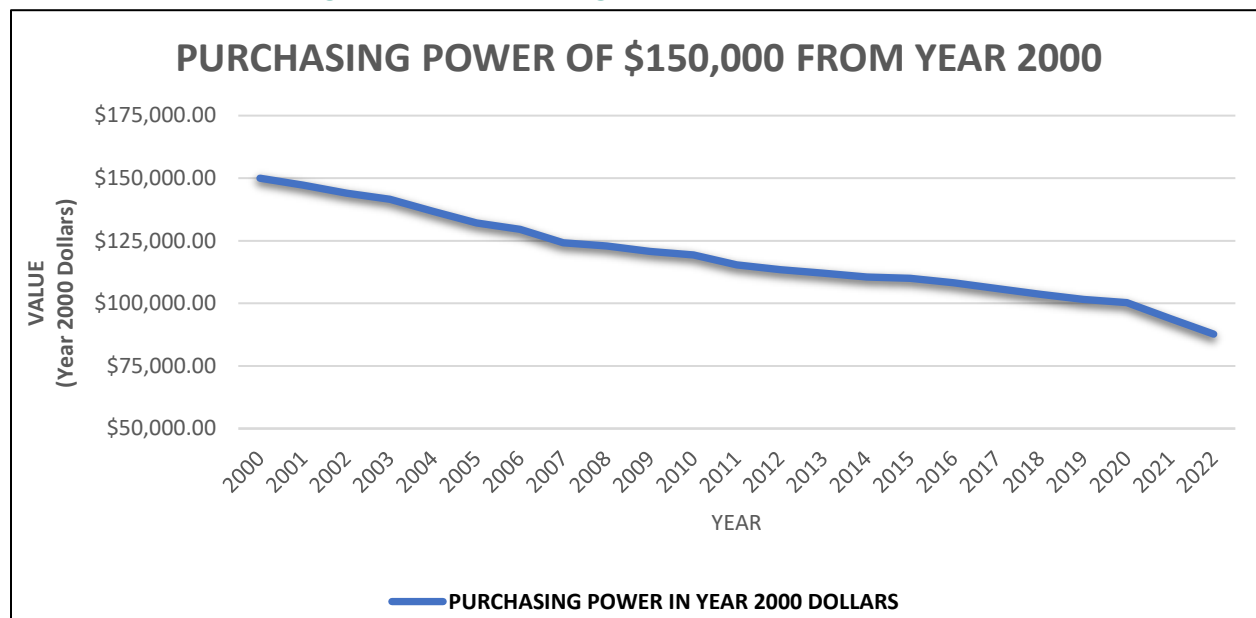
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<sup>1</sup> <https://www.faa.gov/sites/faa.gov/files/airports/aip/overview/AIP-Program-History.pdf>

## Purchasing Power of \$150,000

The U.S. Bureau of Labor Statistics states that the cost of goods and services, otherwise known as the Consumer Price Index (CPI) has inflated by approximately 71 percent from the years 2000 to 2022. This rate of inflation means that a project that would have cost \$150,000 in the year 2000 would cost approximately \$256,500 in 2022 dollars. In other words, the purchasing power of the dollar has decreased dramatically while non-primary entitlement funding has remained the same. The graph in **Figure A-1** below illustrates the decrease in purchasing power of \$150,000 from 2000 to 2022. By the year 2022, the purchasing power of the non-primary entitlement grant has decreased to less than \$90,000 in 2000 dollars.

**Figure A-1: Purchasing Power from 2000 to 2022**



Source: McFarland Johnson, Inc analysis, 2022.

Not only are prices inflating, but the scope of work associated with AIP-eligible projects is continuously expanding. Increased funding is necessary to keep pace.

### Considerations from The RAND Report

The RAND Corporation released a report in 2018 titled *U.S. Airport Infrastructure Funding and Financing* (The RAND Report). The purpose of the report was to make recommendations on the actions needed to upgrade the national aviation infrastructure system to meet the growing demands of the 21<sup>st</sup> century. A finding of The RAND Report stated that due to its size and passenger activity, smaller airports, which are inclusive of rural airports, have fewer opportunities for funding through Passenger Facility Charges (PFCs), bond proceeds, and non-aeronautical operating revenue. Therefore, smaller airports are more reliant on federal grants to pay for the unavoidable high fixed cost projects of airfield pavement maintenance and repairs, safety and security projects. Because the AIP-eligible projects exceed the annual aviation funding, aviation agencies must advocate for their airports to receive funding through alternative federal, state, and local funding programs.

While The Rand Report focused largely on commercial service airports, the report made specific recommendations on non-primary entitlement funding. The RAND Report recommended Congress remove the non-primary entitlements and provide funding through the State Apportionment mechanism instead. The RAND Report argued that this would allow for the timing and magnitude of grants to be better aligned with the needs of the airports.

If non-primary entitlement funding were to be redirected to state apportionments, Maine would be competing for funding on a national stage. Although state allocations are not published by the FAA, it is known that allocations are determined based on the population and land area of the state. According to the U.S. Census Bureau, Maine was ranked forty-second in the country in terms of population in 2022. Maine is the thirty-ninth largest state in the United States. When considering these statistics, it can be presumed that if non-primary entitlement funding were to be redirected to state apportionment grants, Maine would face a decrease in total funding.

### Considerations from the National Association of State Aviation Officials

As the FAA Reauthorization Act approaches its expiration date, the National Association of State Aviation Officials (NASAO) works with its members to create a list of priorities to be considered. NASAO's priorities for the 2023 FAA Reauthorization included a proposal to increase non-primary entitlement funding to airports with more activity. The proposal included increasing non-primary entitlement funding to \$1,000,000 for national airports, \$500,000 for commercial service non-primary airports, \$500,000 for regional airports, \$250,000 for local airports, \$150,000 for basic airports, and zero dollars for unclassified airports. This would drastically increase the funding of the state's airport system.

NASAO's priorities also proposed to allow for the option of airport sponsors to transfer unused NPE funds to State aviation agencies and make them available to National Plan of Integrated Airport Systems (NPIAS) airports within their state. This mechanism would be beneficial to MaineDOT as it would keep unused funds within the state while also allowing for the redirection of funding between airports based on need.

### Considerations for Discretionary Funding Priority Program

States such as Louisiana and Arizona have enacted programs to allocate discretionary funding based on priority, as determined by the state. This allows the state to determine which discretionary projects will be funded by the state based on a predetermined list of priorities. In some cases, projects are selected using a scored ranking system in which factors such as the capacity for safety enhancement, funding available, impact on the state economy, and risk. An example of a priority hierarchy is as follows:

1. Any previously approved enhancement or project that receives 90% funding from any federal source.
2. Any project that receives 90% federal funding but has not been previously approved or prioritized.
3. Projects related to safety and infrastructure preservation.
4. Projects that will benefit the economic growth of the state.

The creation and subsequent implementation of a funding priority program could provide MaineDOT with a tool to promote mindfulness when funding airport projects within the state. It is recommended that MaineDOT assess program effectiveness through evaluation of the success of other states.

### **Considerations for Alternative Funding Options**

Non-primary entitlement funding may be supplemented by loans and grants available to airports in the State of Maine, including those available through the Northern Borders Regional Commission (NBRC), United States Economic Development Administration (EDA), and the United States Department of Agriculture Rural Development (USDA) and the Transportation, Housing and Urban Development and Related Agencies (THUD). It is recommended that MaineDOT work with airport sponsors to identify applicable grants from the organizations above that can be used to cover the gaps in funding for projects and collaborate in the application process.





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## MEMORANDUM

**TO:** Maine Department of Transportation  
**FROM:** McFarland Johnson, Inc.  
**DATE:** February 23, 2023  
**SUBJECT:** State Block Grant Program  
**PROJECT NO.:** MaineDOT WIN# 018717.03; MJ#19008.00

---

### Introduction

This memorandum outlines the details and characteristics of the Federal Aviation Administration (FAA) State Block Grant Program (SBGP). The intent is to provide the Maine Department of Transportation (MaineDOT) with information about the program to facilitate decision-making as to whether entry into the SBGP would be helpful in MaineDOT's efforts of funding the state's 35 airports included in the National Plan of Integrated Airports (NPIAS) based on FAA Advisory Circular (AC) 150/5100-21, *State Block Grant Program*, and FAA order 5100.38D, *Airport Improvement Program Handbook*.

The SBGP was initiated in 1987 when Congress authorized the FAA to initiate a pilot program. The SBGP now includes 10 states (Georgia, Illinois, Michigan, Missouri, New Hampshire, North Carolina, Pennsylvania, Tennessee, Texas, and Wisconsin). In 2018, the FAA Reauthorization Act of 2018 authorized up to 20 states to participate in the Program.

The program is only intended for general aviation, reliever, and nonprimary commercial service airports. The program is designed to allow participating states to perform FAA oversight and manage Airport Improvement Program (AIP) funding. The state DOTs have discretion as to where and how to allocate AIP funds.

### FAA SBGP Rules and Regulations

The AIP Handbook lists the responsibilities of a participating state in the SBGP. SBGP participants enter into a Memorandum of Agreement (MOA) with the FAA to clearly define roles and responsibilities. Unless specifically waived in the MOA, the State must ensure all applicable statutory and regulatory requirements discussed in the AIP Handbook are carried out.

The following requirements of a state participating in the SBGP are outlined in FAA AC 150/5100-21:

1. The state's program must be based on state legislation that authorizes acceptance of federal funds on behalf of airport sponsors;
2. The state's program must include only eligible airports, eligible projects, and allowable costs for the projects. See the AIP Handbook, paragraph 3-43 for guidance on ineligible work;
3. The MOA must identify the responsibilities of the state and FAA, reflect the requirements of governing legislation and regulations, identify accountability of each party, and address major program elements (see Article IV of the MOA, paragraphs 19-34);
4. The state staff must be sufficient in number, and professional competency, to administer the program and manage all aspects of block grants and subgrants;
5. FAA block grant agreements and subgrants must meet the requirements of the governing documents and identify subgrantees, funding amounts, projects, and funding type(s). All subgrants must identify these same data elements;
6. State priorities for the selection of projects to fund must be consistent with Federal priorities;
7. State program processes must be clear, transparent, and ethically sound. The state must issue clear and thorough program guidance to airport sponsors;
8. Projects must be AIP eligible, justified, and completed in a timely, efficient, and cost-effective manner;
9. A state that is also the airport sponsor (or acts as an agent for the airport sponsor on contractual matters) must do so in a manner that avoids any actual or perceived conflicts of interest;
10. The state's airport development program and projects must meet Federal regulatory requirements, including FAA airport design and construction standards and regulatory requirements, utilizing the most current ACs and orders. Any project deviating from standards must be reviewed, acknowledged, and approved by the FAA, as appropriate, before construction bid documents are issued; and
11. The state must manage AIP funds with effective financial controls and must work with subgrantees to ensure subgrant funds are obligated in a subgrant, invoices and payments are supported with appropriate documentation, and closeouts meet the terms specified in the block grant agreement and MOA.

The participating state and FAA jointly select the airports that will be included in the SBGP, and generally, all eligible airports, or all airports that are not primary commercial service, are public use, located within the territorial boundaries of the participating state, and a member of the NPIAS are included.

The State should closely coordinate with the FAA Airports District Office (ADO), which in the case of Maine is under the FAA New England Region located in Burlington, MA. An application consists of a letter of request with the following information:

1. The state has an organization capable of effectively administering block grants;
2. The state uses a satisfactory airport system planning process;
3. The state uses a programming process acceptable to the Secretary of Transportation;
4. The state has agreed to comply with the United States Government's standard requirements for administering the block grant, including the National Environmental Policy Act of 1969

(title 42 U.S.C., § 4321 et seq.), Executive orders, agency regulations, agency guidance, and other Federal environmental requirements<sup>1</sup>; and

5. The state has agreed to provide the Secretary of Transportation with the required program information.

FAA AC 150/5100-21 outlines the following six-step process for the awarding of grants:

1. The state works with participating airport sponsors to outline a Capital Improvement Plan (CIP). The state then prepares and submits a statewide CIP to the FAA.
2. The state prepares and submits a grant application to the FAA with the intent of funding all the eligible projects each year based on a prioritized list of recommended Discretionary funding requests.
3. The FAA issues a block grant offer which becomes a formal grant agreement upon acceptance.
4. The state then issues subgrants to the airport sponsors for specific projects.
5. Subgrant projects are then implemented, including bidding, construction, payments, oversight, and closeout (as applicable).
6. Once all FAA grant funds have been expended on airport projects, the FAA block grant is closed out.

## State Block Grant Program Advantages and Disadvantages

An analysis was made by McFarland Johnson Inc. to evaluate the advantages and disadvantages of MaineDOT embarking on an SBGP. **Table A-1** below outlays the general benefits and drawbacks of a State of Maine SBGP.

**Table A-1: SBGP Advantages and Disadvantages**

	Advantages	Disadvantages
1	<b>MaineDOT's Proximity and Understanding of Airports</b>	<b>Cost of Administration of SBGP</b>
	A SBGP would allow MaineDOT to provide informed recommendations tailored to airports' needs, as they have close ties to each airport and the airports' integration into the broader system of the SASP.	The cost of administration of the SBGP falls onto MaineDOT and is estimated at \$800,000, in 2022 dollars, including the increase in required personnel to manage and administrate the program.
2	<b>Flexibility and Optimization</b>	<b>FAA Regulations and Requirements</b>
	A SBGP would allow MaineDOT to flexibly combine and optimize funding to complete projects more efficiently through strategic utilization of non-primary entitlement (NPE) funding and state apportionment. Also, MaineDOT would have the flexibility to issue subgrant offers to airport sponsors throughout the year to accept grants during critical periods thus preventing loss of federal funding.	The resources and funding required for this SBGP would necessitate adherence to the funding restrictions and eligibility criteria set forth by AIP program regulations (i.e. only AIP-eligible projects.).

	Advantages	Disadvantages
3	<b>Centralized Funding Approach</b>	<b>Regulatory Compliance Mandates</b>
	The SBGP would establish a singular authority with direct system knowledge to oversee the program, streamline the AIP approval process for eligible projects; reduce duplicate funding efforts for airport sponsors; and facilitate coordination between airports and state/federal environmental agencies to ensure reasonable and appropriate levels of environmental mitigation.	MaineDOT is expected to comment on airspace studies, however they have no jurisdiction.
4	<b>Continuous Funding and Project Continuity</b>	<b>Continuity Risks</b>
	The SBGP would allow MaineDOT to receive more Period of Performance (PoP) time on expiring NPEs by converting expiring NPEs to State Apportionment (SA), which MaineDOT can use on Airports for another four (4) years.	Change in MaineDOT and other state leadership can lead to potential deviations from originally established goals and objectives for the program.

Source: McFarland Johnson, Inc., analysis 2023

## Conclusion

While implementing a State Block Grant Program in Maine presents potential advantages, further exploration is warranted to evaluate its feasibility, particularly in addressing the State’s administrative expenses associated, and personnel needed with operating such a program in a fiscally constrained environment. As established in Phase I, funding remains a significant issue across the SASP with factors such as ineligible AIP projects, low-competing/high-cost projects, the diminished purchasing power of AIP entitlements, and various other financial considerations impacting each airport and its community needs.

The estimated \$800,000, in 2022 dollars, required for the administration of the SBGP could alternatively be allocated towards solutions that address funding gaps across the SASP and generate a more direct and appropriate impact. MaineDOT already has a comprehensive awareness of the optimal allocation of funding throughout the System through its coordination with airports through the Airport Capital Improvement Program (ACIP).

While the current fiscal environment presents challenges, the potential benefits of the SBGP warrant continued consideration. Further assessment of how the SBGP might align with the State’s goals and priorities is recommended. As funding needs evolve, the SBGP may offer a viable pathway to address funding gaps and support long-term sustainability of the SASP.



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## MEMORANDUM

**TO:** Maine Department of Transportation  
**FROM:** McFarland Johnson, Inc.  
**DATE:** November 28, 2022  
**SUBJECT:** State-Wide Alternative Funding Opportunities  
**PROJECT NO.:** MaineDOT WIN# 018717.03; MJ# 19008.00

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### Introduction

The State of Maine, through its Department of Transportation (MaineDOT), has tasked McFarland Johnson, Inc. (MJ) with aviation system planning services for the development of a State Aviation System Plan (SASP). This memorandum aims to serve as a resource to understand how general aviation airport sponsors can apply alternative federal funding to projects and utilize funding alternatives to fill a gap in funding in the State of Maine.

Funding for eligible airport projects is often accomplished through the Federal Aviation Administration's (FAA) Airport Improvement Program (AIP). Under typical circumstances, the AIP program provides funding of up to 90 percent of the total project cost at a general aviation airport, supplemented by state and local funding. MaineDOT may provide funding for five percent or greater of the project cost through bond and fuel tax revenues and the remaining 5 percent of total project cost falls to the airport sponsor.

For airport sponsors with limited funds, producing the dollar amount required to pay for 5 percent of the total project cost is often a heavy burden on the community. Additionally, many project types are deemed ineligible or low priority through FAA-AIP, including terminal improvements, snow removal equipment (SRE), SRE buildings, hangars, mowing equipment, and fuel farms. Therefore, these types of projects require alternative funding sources to help progress them. Obtaining funding is a key role for airport sponsors to maintain the critical transportation infrastructure necessary to promote safety, accessibility, economic growth, and community development.

To supplement FAA-AIP and MaineDOT funding, loans and grants are available as alternative funding sources to airports in the State of Maine. Sources of alternative funding programs include:

- Northern Borders Regional Commission (NBRC)
- United States Economic Development Administration (EDA)
- United States Department of Agriculture Rural Development (USDA)
- Department of Transportation (DOT)

This memorandum details program eligibilities, funding options, amounts, and the application processes.

## Northern Borders Regional Commission

Through a partnership between the Federal Government and the States of Maine, New Hampshire, New York, and Vermont, the NBRC funds economic development and infrastructure projects throughout designated counties. The goal of NBRC’s State Economic & Infrastructure Development Investment Program (SEID) is to invest in projects that will result in job creation and reduce poverty, unemployment, and outmigration.

### Eligibility

The NBRC conducts an annual assessment of the level of economic and demographic distress to evaluate funding eligibility and the percent match required. The distress categories, funding match requirements, and counties in the State of Maine associated with each are described below. There are four counties (Cumberland, Lincoln, Sagadahoc, and York) located within the State of Maine that do not fall into the NBRC Service Area and therefore are not included in the categories below:

- Distressed: Eligible for 80 percent funding with 20 percent match required
  - Maine Counties: Androscoggin, Aroostook, Franklin, Kennebec, Oxford, Penobscot, Piscataquis, Somerset, Waldo, and Washington
- Transitional: Eligible for 50 percent funding with 50 percent match required
  - Maine Counties: Hancock and Knox
- Attainment: Ineligible for funding
  - Maine Counties: None

Distressed counties are defined by the NBRC as counties that “have high rates of poverty, unemployment, or outmigration” and “are the most severely and persistently economically distressed and underdeveloped.”

Transitional counties are defined by the NBRC as counties that “Counties that have recently suffered high rates of poverty, unemployment, or outmigration” or “are economically distressed and underdeveloped.”

Attainment counties are defined by the NBRC as “Counties are those that are neither “distressed” or “transitional”.

### Grant Amounts & Project Examples

The maximum grant amount for 2022 is one million dollars (\$1,000,000) for construction in support of infrastructure. Infrastructure projects include transportation infrastructure, basic public infrastructure, telecommunications infrastructure, and renewable and alternative energy infrastructure. All other non-infrastructure applications are eligible for a maximum grant amount of three hundred and fifty thousand dollars (\$350,000). Non-infrastructure projects may include those associated with business and workforce development, basic health care, resource conservation, tourism, and recreation.

### Examples of infrastructure grants awarded in the past include:

- Removal and relocation of two underground fuel storage tanks at the airport
- Architectural and engineering design for a new terminal building

- Reconstruction of public roads necessary for airport access
- Pump station upgrades and improvements
- Utility modifications and replacement
- Climate resiliency planning

**Application Review**

- Maine Priority
- Project Qualification and Collaboration
- Alignment with Maine’s 10-Year Economic Development Strategy
- Workforce

The scoring system for NBRC in the state of Maine is provided in **Attachment A**. For more information on the NBRC grant visit: <https://www.nbrc.gov/content/program-areas>

**Economic Development Administration**

The EDA Public Works Program empowers distressed communities to transition to competitive economic centers through public infrastructure. State, county, and city or township governments, which make up the majority of the airport sponsors in Maine, are all eligible applicants.

**Eligibility**

Projects funded under EDA’s Public Works Program must be consistent with the region’s current Comprehensive Economic Development Strategy (CEDS) or equivalent EDA-accepted regional economic development strategy. The CEDS planning document should be obtained through the region’s appropriate EDA representative as listed in the current year’s *Notice of Funding Opportunity Public Works and Economic Adjustment Assistance Programs*. This may be accessed through the EDA’s website (www.eda.gov) under the heading “Funding Opportunities”.

**Grant Amounts & Project Examples**

The Public Works Program generally funds up to fifty percent (50 percent) of the eligible project costs. However, this number can be as high as eighty percent (80 percent) based on the average per capita income or unemployment rate of the region in which the project is located. **Table A-1** below outlines the maximum allowable investment rates per region type.

Grant awards range from five hundred thousand dollars (\$500,000) to one million dollars (\$1,000,000) for implementation projects and from one hundred thousand dollars (\$100,000) to three hundred and fifty thousand dollars (\$350,000) for planning activities.

**Table A-1 EDA Public Works Program Maximum Allowable Investment Rates Per Region Type**

Projects located in regions in which:	Maximum allowable investment rates (percentage of total project cost)
(A) The 24-month unemployment rate is at least 225% of the national average; or	80
(B) The per capita income is not more than 50% of the national average.	80
(C) The 24-month unemployment rate is at least 200% of the national average; or	70
(D) The per capita income is not more than 60% of the national average.	70
(E) The 24-month unemployment rate is at least 175% of the national average; or	60
(F) The per capita income is not more than 65% of the national average.	60
(G) The 24-month unemployment rate is at least 1 percentage point greater than the national average; or	50
(H) The per capita income is not more than 80% of the national average.	50

Source: EDA.gov

Examples of grants awarded under the Public Works Program in the past include:

- Expansion of access to existing terminal building through the reconstruction of public roads and rail
- Hangar construction, retrofitting, rehabilitation, and expansion
- Construction of airfield infrastructure to support hangar and terminal expansion
- Airport facilities expansion and improvements

**Application Review**

Applications are reviewed by a regional Investment Review Committee (IRC) consisting of EDA staff members. The projects are awarded based on a series of seven (7) criteria, each receiving equal weight. The review criteria are described below:

- The project’s sustainability/durability, including the extent to which the project demonstrates support from regional stakeholders (private, public, and non-profit entities, etc.);
- The applicant’s organizational capacity, including its financial and management capacity;
- The project’s alignment with the regional CEDS or equivalent EDA-accepted economic development strategy, including the extent to which the project is aligned with and integrated into other public or private investments currently ongoing or planned for the community and region;
- The project’s demonstrated alignment with EDA’s current Investment Priorities;



- The project’s demonstrated ability to foster the creation and/or retention of high-quality jobs and promote private investment in the regional economy;
- The extent to which the project will enable the community/region to become more economically diversified and prosperous; and
- The project’s feasibility, which may include the availability and committed nature of proposed matching funds.

Following a recommendation by the IRC, the applications are forwarded to the Regional Director who provides a final selection decision.

For more information on the EDA Public Works Program visit: <https://www.eda.gov/funding/programs/public-works>

### United States Department of Agriculture – Rural Development

Airports are invited to apply to three (3) of the over 50 loan and grant programs offered by United States Department of Agriculture (USDA) Rural Development. The following programs that could apply to airport projects are described in more detail below:

- Community Facilities and Direct Loan and Grant
- Community Facilities Guaranteed Loan Program
- Rural Business Development Grant (RBDG)

#### Community Facilities Direct Loan and Grant

This program provides affordable funding to develop essential community facilities in rural areas. Community facilities do not include private, commercial, or business-oriented developments. The funding available under this program is either via a low-interest direct loan, grants, or a combination of both.

#### Eligibility

Eligible borrowers include public bodies within communities in rural areas with populations of 20,000 residents or less, including Federally recognized Tribal lands, based on the latest U.S. Census Data.

Applicants must be unable to finance the project from their own resources and/or through commercial credit at reasonable rates and terms. Projects must serve a rural area and demonstrate substantial community support. An environmental review must be completed and acceptable.

#### Loan/Grant Amounts & Project Examples

Funds are available in the form of low-interest direct loans, grants, or a combination of both. Loans and grants may be combined with commercial financing to finance a single project if all eligibility and feasibility requirements are met.

Repayment terms may be a maximum of 50 years or not longer than the useful life of the facility, state statutes, or the applicant’s authority, whichever is less. Loan interest rates are set by USDA Rural Development. Interest rates are fixed for the entire term of the loan after the loan is approved. There are no pre-payment penalties.

Grant assistance is limited to the following percentages of eligible project costs:

- Maximum of 75 percent when the proposed project area meets the following parameters:
  - A rural community with a population of 5,000 or fewer; and
  - Median household income is below the poverty line or 60 percent of the State's nonmetropolitan median household income.
- Maximum of 55 percent when the proposed project area meets the following parameters:
  - A rural community with a population of 12,000 or fewer; and
  - Median household income is below the poverty line or 70 percent of the State's nonmetropolitan median household income.
- Maximum of 35 percent when the proposed project area meets the following parameters:
  - A rural community with a population of 20,000 or fewer; and
  - Median household income is below the poverty line or 80 percent of the State's nonmetropolitan median household income.
- Maximum of 15 percent when the proposed project area meets the following parameters:
  - A rural community with a population of 20,000 or fewer; and
  - Median household income is below the poverty line or 90 percent of the State's nonmetropolitan median household income.

**Application Review**

Funding is prioritized on a point system based on populations and median household income. Small communities with a population of 5,500 or less and low-income communities having a median household income below 80 percent of the state's non-metropolitan median household income receive funding priority.

Applications are accepted year-round. Applicants are advised to contact their local USDA Rural Development office to discuss a specific project.

For more information on the USDA Community Facilities Direct Loan & Grant Program visit: <https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-direct-loan-grant-program>

**Community Facilities Guaranteed Loan Program**

This program provides loans to eligible lenders (local banks) to develop essential community facilities in rural areas. The term "facility" refers to both the physical structure financed, and the resulting service provided to rural residents or rural businesses. Community facilities do not include private, commercial, or business-oriented developments.

**Eligibility**

Eligible borrowers include public bodies within communities in rural areas with populations of 50,000 residents or less, excluding incarcerated populations, based on the latest decennial census of the United States and not in the urbanized contiguous and adjacent to that city or town.

**Loan Amounts & Project Examples**

Funds are reserved each year for projects located in rural areas on a schedule. The funding schedule reserves 100 percent of the first two hundred million dollars (\$200,000,000), 50 percent of the next two hundred million dollars (\$200,000,000), and 25 percent of all amounts exceeding

four hundred million dollars (\$400,000,000). The maximum guaranteed loan amount is one hundred million dollars (\$100,000,000).

Examples of loans provided under the Community Facilities Direct Loan and Grant Program in the past include airport hangars, public safety services such as fire departments, police stations, police vehicles, fire trucks, public works vehicles, or equipment, and utility services.

**Application Review**

Applications are accepted and reviewed through USDA Rural Development local offices year-round.

**Economic Impact Initiative Grants**

This program provides funding assistance to develop community facilities in areas of extreme unemployment and severe economic depression.

**Eligibility**

Public bodies, nonprofits, and federally recognized Tribes looking to construct, enlarge, or improve community facilities may apply for this program. Eligible areas include communities with 20,000 residents or less, an unemployment rate of greater than 19.5 percent, and a median household income below 90 percent of the State's non-metropolitan median household income.

**Grant Amounts & Project Examples**

Grant amounts up to 75 percent of the project cost are available. Examples of grants awarded under the Community Facilities Direct Loan and Grant Program in the past include airport hangars, public safety services such as fire departments, police stations, police vehicles, fire trucks, public works vehicles, or equipment, and utility services.

**Application Review**

Applications are accepted and reviewed through USDA Rural Development local offices year-round.

For more information on the USDA Community Facilities Guaranteed Loan Program visit: <https://www.rd.usda.gov/programs-services/community-facilities/community-facilities-guaranteed-loan-program>

**Rural Business Development Grant (RBDG)**

This program offers funding for technical assistance, training, and other activities leading to the development or expansion of small and emerging private businesses in rural areas.

**Eligibility**

Applicant businesses must have 50 employees or fewer, total less than one million dollars in gross revenues, and be located in rural areas with a population of 50,000 residents or fewer.

**Grant Amounts & Project Examples**

There is no maximum grant amount, however, smaller requests are given higher priority. Most grants range from ten thousand dollars (\$10,000) to five hundred thousand dollars (\$500,000). Grant funding is limited statutorily up to ten percent of the total RBDG annual funding.

**Eligible project types may include:**

- Training and technical assistance, such as project planning, business counseling/training, market research, feasibility studies, professional/technical reports, or product/service improvements;
- Acquisition or development of land, easements, or rights of way; construction, conversion, or renovation of buildings, plants, machinery, equipment, access streets, roads, parking areas, and utilities
- Pollution control and abatement
- Capitalization of revolving loan funds including funds that will make loans for start-ups and working capital
- Distance adult learning for job training and advancement
- Rural transportation improvement
- Community economic development
- Technology-based economic development
- Feasibility studies and business plans
- Leadership and entrepreneur training
- Rural business incubators
- Long-term business strategic planning

**Application Review**

RBDG applications compete at the state office level, which is dependent on appropriations. Applications are evaluated based on the following criteria:

- Evidence of job creation to occur with local businesses;
- Percent of nonfederal funding committed to the project;
- Economic need in the area to be served;
- Consistency with local economic development priorities;
- Experience of the grantee with similar efforts; and
- Other factors described in the current Notice of Solicitation of Applications (NOSA), if one is published.

Applications are accepted and reviewed through USDA Rural Development local offices once per year.

For more information on the Rural Business Development Grant visit: <https://www.rd.usda.gov/programs-services/business-programs/rural-business-development-grants>

**UBS Financial Services**

UBS Financial Services (UBS) was contacted during this study. UBS provides funding options to commercial service airports in the form of bonds. While there is no formal application process, airports must meet size and revenue requirements to apply. These requirements exceed what can be accomplished by GA Airports. Therefore, this financing option does not apply.

## Transportation, Housing and Urban Development and Related Agencies (THUD)

An annual appropriations bill that provides funding for various federal programs related to transportation infrastructure and housing and urban development, which are managed by the United States Department of Transportation (USDOT) and the Department of Housing and Urban Development (HUD). This includes Congressionally Directed Spending (CDS) for specific programs within these areas.

### Eligibility

Airports must be a part of the National Plan of Integrated Airports Systems (NPIAS), and the project must meet the eligibility criteria outlined in 49 USC Ch.471: Airport Development, as well as be AIP eligible. The project must be supported broadly by local stakeholders, including residents, business, and elected officials. The project must be administered by an airport and/or an airport sponsor and must comply with the various federal requirements such as competitive contracting, Buy America provisions and the National Environmental Policy Act (NEPA).

### Grant Amounts & Project Examples

The federal cost sharing requirements of AIP applies to the THUD grant. This grant can cover up to 75% of eligible costs for large, medium primary hub airports and 90% - 95% of eligible costs for small primary, reliever and general aviation airports. The average grant award for FY22 was four Million (\$4,000,000).<sup>1</sup>

### Eligible project types may include:

- Terminal expansion, improvements, or construction
- ATCT construction
- Runway, Taxiway, and Apron Rehabilitation or Reconstruction
- Land Acquisition
- Runway Lighting
- ARFF facilities
- Airport Roadways

### Application Review

The application is similar to the application process required for AIP grants with emphasis on the following<sup>2</sup>:

- Airport Recipient and Project Name
- General description of the project and why it is needed

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<sup>1</sup> Subcommittee on Transportation, Housing and Urban Development and Related Agencies. Airport Improvement Program (AIP) Department of Transportation Guidelines and Requirements for Appropriations Submission Database. FY23. <https://democrats-appropriations.house.gov/sites/evo-subsites/democrats-appropriations.house.gov/files/FY23%20THUD%20Guidance%20for%20Airport%20Improvement%20Program.pdf>

<sup>2</sup> Subcommittee on Transportation, Housing and Urban Development and Related Agencies. Airport Improvement Program (AIP) Department of Transportation Guidelines and Requirements for Appropriations Submission Database. FY23 Available: <https://appropriations.house.gov/sites/evo-subsites/republicans-appropriations.house.gov/files/evo-media-document/fy25-thud-airport-improvement-program-aip-projects-guidance.pdf>.

- Has the sponsor provided assurances that the project is eligible under AIP statutes?
- What are the benefits of this project and why is it a priority?
- Amount requested for the community project for the FY and the total project cost
- Estimated start and completion dates
- Does the project have other public (federal, state, local) and or/private funds for the required cost-share and committed for the forecasted operations and maintenance costs? What is the source and amount of those funds?
- Has the airport submitted a grant application for the same project to the FAA?

This is a highly competitive program contending with projects across the DOT and HUD with limiting funding available. Airport sponsors are encouraged to engage with their Airport District Office (ADO) to ensure eligibility and work with their federal, state and local officials for support with the application. Based upon previous application timelines, applications to the subcommittee on THUD are due around springtime for the next fiscal year, in line with the broader congressional appropriation timeline.

### State and Federal Grant and Loan Recommendations by Project Type

Below is a listing of grant eligibility by project type. Each grant program has its own unique application process and ranking system and may change as the years progress. The eligibility status is based solely upon the base eligibility requirements. It is recommended that the sponsor collaborates with MaineDOT to investigate further for the right-sized effort in applying for these loans or grants on an individual airport and project basis. The project types analyzed are listed below:

- AIP Ineligible Crosswind Runways
- Taxiway Widths Beyond TDG
- Hanger Upgrades and Construction
- Snow Removal Equipment (SRE) Buildings
- AIP Ineligible Fuel Farm Rehabilitation and Replacements

For the purpose of this study Snow Removal Equipment (SRE) and Mowing equipment were not included in this analysis due to their uncertain eligibility for the grants and loans discussed in this document. THUD was not included in the analysis due to the discretionary nature and unique considerations for each specific project.

### Crosswind Runways Grant and Loan Opportunities

**Table A-2** below outlines grant and loan opportunities and base eligibility for airports with crosswind runways that are ineligible for AIP funding. Three (3) grant and loan sources are targeted towards infrastructure projects, in which crosswind runways fall into this category.

**Table A-2: Crosswind Runways Grant and Loan Eligibility**

Airport	Airport Code	NBRC Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guaranteed Loan Program Eligibility
Augusta State	AUG	Eligible - Distressed (80% funding/20% Match)	Eligible at 15% - 35% Total Project Cost	Eligible
Biddeford Municipal	B19	Ineligible	Ineligible	Eligible
Caribou Municipal	CAR	Eligible - Distressed (80% funding/20% Match)	Eligible at 55% Total Project Cost	Eligible
Central Maine /Norridgewock	OWK	Eligible - Distressed (80% funding/20% Match)	Eligible at 55% Total Project Cost	Eligible
Dewitt Field/Old Town Municipal *	OLD	Eligible - Distressed (80% funding/20% Match)	Eligible at 55% Total Project Cost	Eligible
Dexter Regional**	1B0	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Greenville Municipal	3B1	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Hancock County/Bar Harbor	BHB	Eligible - Transitional (50% Funding/50% Match)	Eligible at 55% Total Project Cost	Eligible
Houlton International	HUL	Eligible - Distressed (80% funding/20% Match)	Eligible at 55% Total Project Cost	Eligible
Millinocket Municipal	MLT	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Waterville Robert Lafleur	WVL	Eligible - Distressed (80% funding/20% Match)	Eligible at 15% - 35% Total Project Cost	Eligible

*McFarland Johnson, Inc. analysis, 2022.*

\*\* DeWitt Field/Old Town (OLD) technically fulfills the FAA eligibility criteria, but is included due to the incomplete data available regarding both the absence of weather reporting stations and incomplete GARD data to measure operations.

\*Currently a Turf runway

In addition to the grants and loans listed above Augusta State and Hancock County/Bar Harbor may benefit from redevelopment and could qualify for grants through the Economic Development Administration and the Rural Business Development Grant program.

**Taxiway Width Grant and Loan Opportunities**

Taxiway widths exceeding their Taxiway Design Group (TDG) specifications and failing to meet their regular use requirements are ineligible for AIP funding. **Table A-3** below details base grant and loan eligibility for airports with AIP-ineligible taxiways. The three (3) grant and loan sources are directly applicable to infrastructure projects in which Taxiways fall within this classification.

**Table A-3: Taxiway Widths Grant and Loan Eligibility**

Airport Name	ID	NBRC Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guaranteed Loan Program Eligibility
Auburn/Lewiston Muni	LEW	Eligible - Distressed (80% funding/20% Match)	Ineligible	Eligible
Augusta State	AUG	Eligible - Distressed (80% funding/20% Match)	Eligible at 15% - 35% Total Project Cost	Eligible
Belfast Muni	BST	Eligible - Distressed (80% funding/20% Match)	Eligible at 15% - 35% Total Project Cost	Eligible
Biddeford Muni	B19	Ineligible	Ineligible	Eligible
Brunswick Executive	BXM	Ineligible	Ineligible	Eligible
Central Maine Regional	OWK	Eligible - Distressed (80% funding/20% Match)	Eligible at 55% Total Project Cost	Eligible
Dewitt Field/Old Town Municipal	OLD	Eligible - Distressed (80% funding/20% Match)	Eligible at 55% Total Project Cost	Eligible
Eastern Slope Regional	IZG	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Eastport Muni	EPM	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Greenville Muni	3B1	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible



Airport Name	ID	NBRC Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guaranteed Loan Program Eligibility
Hancock County-Bar Harbor	BHB	Eligible - Transitional (50% Funding/50% Match)	Eligible at 55% Total Project Cost	Eligible
Houlton Intl	HUL	Eligible - Distressed (80% funding/20% Match)	Eligible at 55% Total Project Cost	Eligible
Islesboro	57B	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Knox County Regional	RKD	Eligible - Transitional (50% Funding/50% Match)	Eligible at 55% Total Project Cost	Eligible
Lincoln Regional	LRG	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Machias Valley	MVM	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Millinocket Muni	MLT	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Northern Aroostook Regional	FVE	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Oxford County Regional	81B	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Pittsfield Muni	2B7	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Steven A Bean Muni	8B0	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Stonington Muni	93B	Eligible - Transitional (50% Funding/50% Match)	Eligible at 75% Total Project Cost	Eligible
Sugarloaf Regional	B21	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible

Airport Name	ID	NBRC Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guaranteed Loan Program Eligibility
Waterville-Robert LaFleur	WVL	Eligible - Distressed (80% funding/20% Match)	Eligible at 15% - 35% Total Project Cost	Eligible
Wiscasset	IWI	Ineligible	Eligible at 75% Total Project Cost	Eligible

Source: McFarland Johnson, Inc analysis, 2022

**Terminal Facilities Upgrades and or Construction Grant and Loan Opportunities**

**Table A-4** below outlines grant and loan opportunities and base eligibility for airports with Terminal facilities upgrades and construction programmed into the Airport Capital Improvement Plan (ACIP). Three (3) grant and loan sources (Northern Border Regional Commission, USDA Community Facilities Direct Loan and Grant, and USDA Community Facilities Guarantee Loan Program) are targeted toward infrastructure projects, in which Terminal facilities fall within this category. Terminal facilities might also be eligible under the EDA grants program due to their ability to create jobs and investment into the regional economy and be included in the analysis.

**Table A-4: Terminal Facilities Grant and Loan Eligibility**

Airport Name	ID	NBRC Eligibility	EDA Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guarantee Loan Program Eligibility
Auburn/Lewiston Muni	LEW	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Ineligible	Eligible
Augusta State	AUG	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 15% - 35% Total Project Cost	Eligible
Biddeford Muni	B19	Ineligible	Ineligible	Ineligible	Eligible
Caribou Muni	CAR	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 55% Total Project Cost	Eligible
Central Maine Airport of Norridgewock	OWK	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 55% Total Project Cost	Eligible

Airport Name	ID	NBRC Eligibility	EDA Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guarantee Loan Program Eligibility
Dewitt Field/Old Town Municipal	OLD	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 55% Total Project Cost	Eligible
Dexter Regional	1B0	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible
Eastern Slope Regional	IZG	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible
Eastport Muni	EPM	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible
Greenville Muni	3B1	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible
Hancock County-Bar Harbor	BHB	Eligible - Transitional (50% Funding/50% Match)	Ineligible	Eligible at 55% Total Project Cost	Eligible
Houlton Intl	HUL	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 55% Total Project Cost	Eligible
Lincoln Regional	LRG	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible
Northern Aroostook Regional	FVE	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible

Airport Name	ID	NBRC Eligibility	EDA Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guarantee Loan Program Eligibility
Oxford County Regional	81B	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible
Princeton Muni	PNN	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible
Sanford Seacoast Regional	SFM	Ineligible	Ineligible	Ineligible	Eligible
Sugarloaf Regional	B21	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible

Source: McFarland Johnson, Inc analysis, 2022.

### Hanger Upgrades and Hanger Construction Grant and Loan Opportunities

**Table A-5** below outlines grant and loan opportunities and base eligibility for airports with Hanger construction or upgrades programmed into the ACIP. Three (3) grant and loan sources (Northern Border Regional Commission, USDA Community Facilities Direct Loan and Grant, and USDA Community Facilities Guarantee Loan Program) are targeted towards infrastructure projects, in which hangers fall into this category. Hangers might also be eligible for two (2) grant sources (EDA and RBDG) due to their ability to create jobs and investment into the regional economy of rural areas and included in the analysis.

**Table A-5: Hanger Upgrades and Construction Grant and Loan Eligibility**

Airport Name	ID	NBRC Eligibility	EDA Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guarantee Loan Program Eligibility	RBDG Eligibility
Auburn/Lewiston Muni	LEW	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Ineligible	Eligible	Eligible

Airport Name	ID	NBRC Eligibility	EDA Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guarantee Loan Program Eligibility	RBDG Eligibility
Augusta State	AUG	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 15% - 35% Total Project Cost	Eligible	Eligible
Bethel Regional	OB1	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible
Brunswick Executive	BXM	Ineligible	Ineligible	Ineligible	Eligible	Eligible
Dewitt Field/Old Town Municipal	OLD	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 55% Total Project Cost	Eligible	Eligible
Dexter Regional	1B0	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible
Houlton Intl	HUL	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 55% Total Project Cost	Eligible	Eligible
Lincoln Regional	LRG	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible
Wiscasset	IWI	Ineligible	Ineligible	Eligible at 75% Total Project Cost	Eligible	Eligible

Source: McFarland Johnson, Inc analysis, 2022.

### SRE Buildings

**Table A-6** below outlines grant opportunities and base grant eligibility for airports with SRE building construction or upgrades programmed into the ACIP. Three (3) grant and loan sources (Northern Border Regional Commission, USDA Community Facilities Direct Loan and Grant, and USDA Community Facilities Guarantee Loan Program) are targeted toward infrastructure projects, in which SRE Buildings fall into this category.

**Table A-6: SRE Buildings Grant and Loan Eligibility**

Airport Name	ID	NBRC Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guaranteed Loan Program Eligibility
Auburn/Lewiston Muni	LEW	Eligible - Distressed (80% funding/20% Match)	Ineligible	Eligible
Bethel Regional	OB1	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Eastport Muni	EPM	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Hancock County-Bar Harbor	BHB	Eligible - Transitional (50% Funding/50% Match)	Eligible at 55% Total Project Cost	Eligible
Machias Valley	MVM	Eligible - Distressed (80% funding/20% Match)	Eligible at 75% Total Project Cost	Eligible
Presque Isle Intl	PQI	Eligible - Distressed (80% funding/20% Match)	Eligible at 55% Total Project Cost	Eligible

Source: McFarland Johnson, Inc analysis, 2022.

**Fuel Farm Rehabilitation and Replacement Grant and Loan Opportunities**

**Table A-7** below outlines grant and loan opportunities and base eligibility for airports that are projected to require Fuel Farm rehabilitation or replacement over the next 20 years. Three (3) grant and loan sources (Northern Border Regional Commission, USDA Community Facilities Direct Loan and Grant, and USDA Community Facilities Guarantee Loan Program) are targeted toward infrastructure projects, in which fuel farms could fall into this category. Fuel farms might also be eligible for two (2) grant sources (EDA and RBDG) due to their ability to create jobs and investment into the regional economy of rural areas and included in the analysis.

**Table A-7: Fuel Farm Rehabilitation and Replacement Grant and Loan Eligibility**

Airport Name	ID	NBRC Eligibility	EDA Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guarantee Loan Program Eligibility	RBDG Eligibility
Augusta State*/**	AUG	Eligible - Distressed (80% funding/20% Match)	Eligible at 50% Total Project Cost	Eligible at 15% - 35% Total Project Cost	Eligible	Eligible

Airport Name	ID	NBRC Eligibility	EDA Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guarantee Loan Program Eligibility	RBDG Eligibility
Belfast Muni*	BST	Eligible - Distressed (80% funding/20 % Match)	Ineligible	Eligible at 55% Total Project Cost	Eligible	Eligible
Biddeford Muni*	B19	Ineligible	Ineligible	Ineligible	Eligible	Eligible
Central Maine Airport of Norridgewock*	OWK	Eligible - Distressed (80% funding/20 % Match)	Eligible at 50% Total Project Cost	Eligible at 55% Total Project Cost	Eligible	Eligible
Dexter Regional**	1B0	Eligible - Distressed (80% funding/20 % Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible
Eastern Slope Regional**	IZG	Eligible - Distressed (80% funding/20 % Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible
Eastport Municipal**	EPM	Eligible - Distressed (80% funding/20 % Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible
Greenville Municipal*/**	3B1	Eligible - Distressed (80% funding/20 % Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible
Machias Valley*/**	MVM	Eligible - Distressed (80% funding/20 % Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible
Northern Aroostook Regional*	FVE	Eligible - Distressed (80% funding/20 % Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible

Airport Name	ID	NBRC Eligibility	EDA Eligibility	Community Facilities and Direct Loan and Grant Program Eligibility	Community Facilities Guarantee Loan Program Eligibility	RBDG Eligibility
Princeton Municipal**	PNN	Eligible - Distressed (80% funding/20 % Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible
Sugarloaf Regional*/**	B21	Eligible - Distressed (80% funding/20 % Match)	Eligible at 50% Total Project Cost	Eligible at 75% Total Project Cost	Eligible	Eligible

Source: McFarland Johnson, Inc analysis, 2022

\* Estimated requiring fuel farm rehabilitation in 10 years

\*\* Estimated requiring fuel farm replacement in 20 years

\*/\*\* Estimated requiring fuel farm rehabilitation in 10 years and replacement in 20 years

In addition to the fuel farm itself, it is recommended that Airports during their masterplan process establish a business plan for the Airport to include the Sponsor’s obligations to cover the cost of the fuel farm rehabilitation and or replacement. These business development strategies can possibly be covered under the Rural Business Development Grant (RBDG) as its main goal is to provide technical assistance, training, and other activities leading to the development or expansion of small and emerging private businesses in rural areas. It is recommended that Airports that are eligible for RBDG work with MaineDOT to determine if it is the right-sized effort in applying for the grant to cover the cost of the development of a business plan for the Airport.



**Attachment A**

<b>NORTHERN BORDER REGIONAL COMMISSION 50 POINTS</b>		
<b>CRITERIA</b>	<b>DESCRIPTION</b>	<b>MAXIMUM POINTS</b>
<b>Project Readiness</b>	<p>This category reflects an applicant's ability to perform the proposed work within the 3-year award period and begin to draw down NBRC funds within 12 months of award. The applicant clearly demonstrates how far along the project is in the necessary planning, design, engineering, and state and local permitting processes including the completion of NEPA. Applicant accounts for feasible timelines for completion and includes a short summary of processes in progress or completed. The applicant shows attention to detail and provides a complete application. Applications with a detailed milestone schedule for completion of award outcomes will have a higher score than those that do not. Applicants describe the project need and the opportunity gained by funding this project now and/or lost by not funding it now. Projects of greater immediacy are given a higher score.</p>	<b>10</b>
<p><b>Points Allocation</b></p> <ul style="list-style-type: none"> <li>Planning and Design (0-2 points)</li> <li>Partnerships (0-2 points)</li> <li>Timeline and Milestone Schedule (0-2 points)</li> <li>Project need and opportunity (0-2 points)</li> <li>Immediacy and relevance (0-2 points)</li> </ul>		

CRITERIA	DESCRIPTION	MAXIMUM POINTS
<b>Project Costs &amp; Match</b>	<p>Budgets and costs, including contingency for construction projects, are clear and reasonable. Project costs and match are clearly outlined. Project costs should include a detailed project budget that aligns with the project description. Project budget shows detailed costs and relevant cost estimates. Project timeline is feasible and supports timely project completion. Applicants must identify sources of match in the budget and detailed budget narrative. Applicants may provide or be asked to provide letters of commitment/support to confirm stated match contributions. Leveraged funds in addition to required match should also be described if applicable. Budget narrative should be aligned with the project description, provide brief justification for expenses over \$5,000, and if requesting the higher maximum for an infrastructure project, describe how the requested funds will be allocated across infrastructure categories.</p>	<b>10</b>
<p><b>Points Allocation</b>            Budget narrative (0-4 points)            Detailed project budget (0-2 points)            Relevant cost estimates (0-2 points)            Match/cost share to complete project clearly identified (0-2 points)</p>		
CRITERIA	DESCRIPTION	MAXIMUM POINTS
<b>Alignment with Agency Investment Priorities</b>	<p>This category reviews how a project fits within the NBRC strategic investment goals and program priorities. The applicant describes how the project meets NBRC investment priorities in the project summary. Projects will receive a higher score based on completeness of addressing relevant investment priorities outlined in the program materials.</p> <ol style="list-style-type: none"> <li>1. Projects that provide benefits to or demonstrate meaningful engagement with communities who have been under-represented in past NBRC investments. Under-invested communities include rural communities (population less than 5,000), communities of color, and tribal communities.</li> <li>2. Projects that address multiple needs and cross multiple investment categories.</li> <li>3. Projects that adapt to changing climate conditions and extreme weather events.</li> </ol>	<b>15</b>

**Points Allocation**

Project describes how it meets NBRC investment priorities in the project summary. Points are awarded based on details provided in the project summary and provided documentation. Additionally, projects that support related regional, state, or local planning efforts will be awarded 1 point. Example plans include hazard mitigation plan, climate plan, equity action plan, or comprehensive plan. Applicants who have not received a past NBRC award will be awarded 1 point.

**1. Agency Diversity, Equity, and Inclusion Investment Priorities (up to 5 points):**

- Project describes benefits to or engagement with underinvested communities, including rural communities (population less than 5,000), communities of color, and tribal communities. NBRC will award points for qualitative description of how the project provides benefits to underinvested communities in the region (0-3 points).
- Points will be awarded for including documentation or references of community size, community demographics, organizational missions, or letters of support connected to underinvested communities. (0-1 points)
- Project describes engagement activities or detailed plans for engaging with underinvested communities as part of the project (0-1 points).

**2. Multiple Needs Investment Priority (up to 5 points):**

- **Infrastructure only.** Project addresses multiple infrastructure needs (0-2 points)
- **Infrastructure only.** Project crosses multiple infrastructure categories. 1 points for clearly articulating on category. Up to 2 points for articulating additional categories. Categories include transportation, basic public infrastructure, and telecommunications. See NBRC definitions. (0-3 points).
- **Non-infrastructure only.** Project addresses multiple community and business development needs (0-2 points)
- **Non-infrastructure only.** Project crosses multiple community and business development categories. 1 points for clearly articulating one category. Up to 2 points for articulating additional categories. Categories include business and workforce development, basic health care, and resource conservation, tourism, recreation. See NBRC definitions. (0-3 points)

**3. Community Resilience Investment Priority (up to 3 points):**

- Applicant acknowledges and demonstrates understanding of climate and weather impacts to project. This can be a description of expected changing climate conditions or weather hazards that may affect the project during its expected life span. (0-1 points)
- Project is not located within a FEMA Flood Hazard Zone, or, if project is in a FEMA Flood Hazard Zone, project has described mitigation measures to protect from 1-percent-annual-chance flood. (0-1 points)
- Project clearly describes how identified actions measurably contribute to reducing carbon emissions. Examples for infrastructure projects may be use of materials and construction techniques, improving efficiency of water treatment plants, incorporation of alternative energy sources, or human powered transportation and recreation. Examples for non-infrastructure projects in support of existing workforces or increasing employment, could include workforce development and training in the fields of efficient, renewable, or clean energy, such as solar installation, green technologies for heating and cooling, and construction management. (0-1 points)

CRITERIA	DESCRIPTION	MAXIMUM POINTS
<b>ECONOMIC IMPACTS</b>	<p>Projects will be reviewed for anticipated economic impact. Economic impacts should be consistent and, where possible, supported by feasibility studies, and/or local, state, or regional data. The project demonstrates it will have impacts such as job retention, job creation and/or wage growth within an identified timeframe. Applicants are encouraged to include narratives from local businesses, leaders, and government officials regarding anticipated economic impacts and the importance to larger economic development strategies.</p>	<b>10</b>
<p><b>Points Allocation</b>            Jobs and employment impacts are described (0-3 points)            Describes scale of impact for community, county, or region (0-3 points)            Documentation provided to support expected impacts (0-4 points)</p>		
CRITERIA	DESCRIPTION	MAXIMUM POINTS
<b>ORGANIZATIONAL CAPACITY</b>	<p>Applicants will be evaluated based on past performance for timely completion, collaboration, staff qualifications, and ability to meet program requirements. Applicant can identify specific grant-awarded projects they have completed or can demonstrate collaboration and relationships with other entities to ensure the project can meet program requirements and be completed in a timely manner. New applicants or applicants with no prior Federal award history will not be reviewed negatively. Describe roles and qualifications of staff and partners. Describe the partnerships to in place.</p>	<b>5</b>
<p><b>Points Allocation</b>            Describes organizational capacity including any partnerships with other entities to fill out expertise (0-2 points)            Provides assessment of past performance (0-1 points)            Provides description of roles and qualifications of project staff and partners (0-1 points)            Early outreach to LDD (0-1 points)</p>		

MAINE 50 POINTS		
CRITERIA	DESCRIPTION	MAXIMUM POINTS
<b>Maine Priority.</b> If the project is Economic Development, Public Infrastructure, Tourism (including Outdoor Recreation), Broadband, Workforce Development/Attraction, Innovation and Entrepreneurship, and Renewable Energy/Climate Resiliency	Maine NBRC Priorities are Infrastructure to support Economic Development (Water, Wastewater, Transportation, Broadband), Tourism, Workforce Development/Attraction, Innovation/Entrepreneurship, and Renewable Energy/Climate Resiliency	15
<b>Alignment with Maine's 10-Year Economic Development Strategy</b> <a href="http://www.maine.gov/decd/strategic-plan">www.maine.gov/decd/strategic-plan</a>	Project clearly aligns with one of the strategies of Maine's Economic Development Strategy. Please note that a project may align with one of Action(s) within these Strategies. A project that aligns with more than one Action (or more than one Strategy) will receive higher points.	5
<b>Economic Development</b>	Project supports the economic development of a municipality or region; project will help existing businesses thrive or help to attract new industry to the area. Projects that are specific about the economic impact of the project will receive more points. Projects that leverage private investment or show collaboration with businesses with receive more points.	5
<b>Workforce.</b> Project will support the creation, retention or attraction of quality jobs; or project will attract talent/workforce to areas of Maine that need it	Project clearly demonstrates commitment to job creation with evidence that jobs will be created or retained as a direct result of the investment; or project will attract new workers to areas of Maine and industries that need more workers (with evidence of this need).	10
<b>Project Quality and Collaboration.</b> Project readiness/Budget/Commitment of matching funds/Sustainable project/Capacity of organization to execute work plan/collaboration with other groups and efforts	Project can begin immediately, budget is clearly developed with matching funds identified; project is sustainable with clearly identified measurable results/goals, applicant and partners demonstrate capacity to execute project and achieve milestones; project aligns/collaborate with other efforts and partners. Overall, the project is regionally relevant with substantial economic impacts as compared to other projects.	15



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## MEMORANDUM

**TO:** Maine Department of Transportation

**FROM:** McFarland Johnson, Inc.

**DATE:** June 11, 2024

**SUBJECT:** Alternative Funding Opportunities: System-Wide Coverage Eligibility

**PROJECT NO.:** MaineDOT WIN# 018717.03; MJ# 19008.00

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### INTRODUCTION

There are various obstacles to funding airport projects across the state of Maine. The Federal Aviation Administration (FAA) Airport Improvement Program (AIP), which typically covers 90 percent of the total project costs, is a critical component in enabling projects to move forward. AIP-ineligible or low-competing/high-cost AIP projects pose a significant funding challenge for the State Aviation System Plan (SASP). These projects provide value to the individual airports and the System in enabling airports to be self-sustaining, provide critical functions, provide for economic development opportunities, and continue operations at optimal levels. This analysis aims to develop potential funding solutions for AIP-ineligible and low-competing/high-cost AIP projects

### ANALYSIS

The analyzed infrastructure, facilities, and equipment projects are derived from the following technical memorandums, *Low-Competing/High-Cost Projects, State-Wide Crosswind Runway Eligibility and Cost*, and *State-Wide Taxiway Width Eligibility and Cost*. The alternative funding sources are composed of the state and federal grants and loans outlined in the *State-Wide Alternative Funding Opportunities* memo as well as additional funding solutions explored in Phase II of the SASP.

The memo is broken down into two (2) categories:

- AIP ineligible infrastructure, facilities, and equipment
  - Ineligible Crosswind Runways
  - Taxiway Widths Beyond the Taxiway Design Group (TDG)
  - Fuel Farm Rehabilitation and Replacement
  - Mowing Equipment
- Low-competing/high-cost infrastructure, facilities and equipment
  - Terminal Upgrades
  - Hangars
  - Snow Removal Equipment (SRE)
  - SRE Buildings

### STATE AND FEDERAL FUNDING SOURCES

The alternative funding sources for infrastructure and facilities projects that are applied in this memo include the following:

- Northern Border Regional Commission (NBRC)
- United States Economic Development Administration (EDA)
- United States Department of Agriculture Rural Development (USDA)
  - Community Facilities Direct Loan and Grant
  - Community Facilities Guaranteed Loan Program
  - Rural Business Development Grant (RBDG)
- Transportation, Housing and Urban Development and Related Agencies (THUD)

For the analysis, the total project cost estimates by airport for each project type are based upon either the Airport Capital Improvement Program (ACIP) identified from the year 2023 – 2029 or the estimated project cost based upon a 20-year life cycle cost analysis of recommended pavement management. For applicable project types, eligible state and federal grants or loans are then applied to the cost estimates to project the base eligibility coverage. For project types that do not have an estimated cost, additional funding solutions are recommended.

Each grant or loan has eligibility requirements and maximum coverage. The amount of estimated funding coverage varies by airport based on their respective qualifying eligibility criteria. THUD was not included in the analysis due to the discretionary nature and unique considerations for each specific project.

### AIP-INELIGIBLE PROJECTS

The following AIP-Ineligible projects were analyzed and if applicable the eligible cost coverage for the state and federal grants and loans were applied to the projected cost estimates by airport:

- Ineligible Crosswind Runways
- Fuel Farm Rehabilitation and Replacement
- Taxiway Widths Beyond TDG
- Mowing Equipment

### INELIGIBLE CROSSWIND RUNWAYS

Nine (9) out of the 15 crosswind runways in the state are either ineligible or have the potential to become ineligible.

**Table A-1** explores the costs based on the 20-year lifecycle analysis for the recommended pavement strategy at these airports and the eligible funding from alternative grants and loans as discussed in the *State-Wide Alternative Funding Opportunities* memo. Three (3) grant and loan sources are targeted toward infrastructure projects, in which crosswind runways fall into this category, including the NBRC, the USDA Community Facilities Direct Loan and Grant, and the USDA Community Facilities Guaranteed Loan Program.

Augusta State (AUG) and Hancock Bar Harbor (BHB) are recommended for redevelopment of the crosswind runways for non-aeronautical use purposes, therefore there are no cost estimates included in the analysis. It is recommended that these airports investigate the potential eligibility of EDA and RBDG to support the redevelopment.

**Table A-1: Crosswind Runways Eligible Grant and Loan Funding Opportunities\***

Airport	Airport Code	Recommended Work	Cost	Potential NBRC Coverage	Potential Community Facilities Direct Loan and Grant Coverage	Potential Community Facilities Guaranteed Loan Coverage
Augusta State	AUG	Redevelopment	\$0	\$0	\$0	\$0
Caribou Municipal	CAR	Reconstruction Reduction to Minimum Pavement	\$2,177,280	\$1,000,000	\$1,197,504	\$744,320
Central Maine /Norridgewock	OWK	Reconstruction Reduction to Minimum Pavement	\$2,041,200	\$1,000,000	\$1,122,660	\$710,300



Airport	Airport Code	Recommended Work	Cost	Potential NBRC Coverage	Potential Community Facilities Direct Loan and Grant Coverage	Potential Community Facilities Guaranteed Loan Coverage
Dewitt Field/Old Town Municipal	OLD	Current Pavement Reconstruction Cost	\$2,383,101	\$1,000,000	\$1,310,706	\$795,775
Dexter Regional	1B0	Current Turf Runway	\$0	\$0	\$0	\$200,000
Greenville Municipal	3B1	Runway to Turf Transition	\$893,548	\$714,838	\$670,161	\$423,387
Hancock County/Bar Harbor	BHB	Redevelopment	\$0	\$0	\$0	\$0
Houlton International**	HUL	Reconstruction Reduction to Minimum Pavement	\$1,837,080	\$1,000,000	\$1,010,394	\$659,270
Millinocket Municipal	MLT	Runway to Turf Transition	\$1,588,000	\$1,000,000	\$1,191,000	\$597,000
Waterville Robert Lafleur**	WVL	Current Pavement Reconstruction Cost	\$1,565,600	\$1,000,000	\$234,840	\$591,400
<b>Total</b>			<b>\$12,485,809</b>	<b>\$6,714,838</b>	<b>\$6,737,265</b>	<b>\$4,721,452</b>

Source: McFarland Johnson, Inc analysis, 2024.

\* Costs reflect 2022-dollar value.

\*\*Existing runway dimensions are smaller than the recommended minimum runway requirements recommended in the high-level runway length analysis therefore the current pavement size is used in the calculations.

Note: Pavement reconstruction is based on \$11.34/SF and transition to turf is based on \$3.97/SF.

As of May 2024, the 2023 FAA Reauthorization Act was fully passed and signed into law. The bill does change eligibility requirements for crosswind runways as follows in Section 702 AIP Definitions<sup>1</sup>:

*“(V) reconstructing or rehabilitating an existing crosswind runway **(regardless of the wind coverage of the primary runway)** if the reconstruction or rehabilitation of such crosswind runway is in the most recently approved Airport Layout Plan of the sponsor.”*

Of note, there are timing considerations from signing into law to enactment across the AIP program as well as how it will rank in the AIP program. Thus, currently ineligible crosswind runways may face the same challenges detailed in the *Low-Competing/High-Cost Projects* memo. It is recommended that MaineDOT and the sponsor collaborate to formulate future funding strategies for crosswind runways, irrespective of the provisions outlined in the currently passed FAA Reauthorization Act.

### FUEL FARM REHABILITATION AND REPLACEMENT

FAA funding for fueling systems at airports is eligible solely during the system’s initial implementation. Subsequently, it falls upon the sponsor to effectively strategize and oversee the cost for the rehabilitation and inevitable replacement of the facilities. The *Low-Competing/High-Cost Projects* memo analysis found that eight (8) airports are expected to require fuel farm rehabilitation within the next ten (10) years and eight (8) airports are expected to require full replacement within the next 20 years. Of note, four (4) airports are expected to require both rehabilitation and replacement over the next 10 – 20 years.

**Table A-2** explores the estimated costs based on the 20-year lifecycle analysis for the rehabilitation and/or the replacement of fuel farm facilities and the potential funding opportunities from alternative grants and loans. Three (3) grant and loan sources, including the NBRC, the USDA Community Facilities Direct Loan and Grant, and the USDA Community Facilities Guarantee Loan Program are targeted toward infrastructure projects. Two (2) grant sources (EDA and RBDG) might also be eligible due to their ability to create jobs and investment into the regional economy of rural areas.

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<sup>1</sup> H.R.3935. Date Accessed May 20,2024.

<https://www.commerce.senate.gov/services/files/070A7E5D-A95A-42D8-99D2-60DEA347EE32>

**Table A-2: Fuel Farm Eligible Grants and Loan Funding Opportunities\*\*\***

Airport Name	ID	Total Expected Cost	Potential NBRC Coverage	Potential EDA Coverage	Potential Community Facilities and Direct Loan and Grant Coverage	Potential Community Facilities Guaranteed Loan Coverage	Potential RBDG Coverage
Augusta State */**	AUG	\$620,000	\$496,000	\$310,000	\$93,000	\$355,000	\$500,000
Belfast Municipal*	BST	\$50,000	\$40,000	\$25,000	\$27,500	\$50,000	\$50,000
Biddeford Municipal*	B19	\$50,000	\$0	\$0	\$0	\$50,000	\$50,000
Central Maine Airport of	OW K	\$50,000	\$40,000	\$25,000	\$27,500	\$50,000	\$50,000
Dexter Regional**	1B0	\$570,000	\$456,000	\$285,000	\$427,500	\$342,500	\$500,000
Eastern Slope Regional**	IZG	\$570,000	\$456,000	\$285,000	\$427,500	\$342,500	\$500,000
Eastport Municipal**	EPM	\$570,000	\$456,000	\$285,000	\$427,500	\$342,500	\$500,000
Greenville Municipal*/**	3B1	\$620,000	\$496,000	\$310,000	\$465,000	\$355,000	\$500,000
Machias Valley*/**	MV M	\$620,000	\$496,000	\$310,000	\$465,000	\$355,000	\$500,000
Northern Aroostook	FVE	\$50,000	\$40,000	\$25,000	\$37,500	\$50,000	\$50,000
Princeton Municipal**	PNN	\$570,000	\$456,000	\$285,000	\$427,500	\$342,500	\$500,000
Sugarloaf Regional*/**	B21	\$620,000	\$496,000	\$310,000	\$465,000	\$355,000	\$500,000

Source: McFarland Johnson, Inc analysis, 2024.

\* Estimated requiring fuel farm rehabilitation in 10 years.

\*\* Estimated requiring fuel farm replacement in 20 years.

\*/\*\* Estimated requiring fuel farm rehabilitation in 10 years and replacement in 20 years.

\*\*\* \* Costs reflect 2022-dollar value.

As highlighted in the *Sponsor Performance Metrics memo*, it is recommended that airports develop a business plan that incorporates the cost considerations of both current and future fueling system rates to ensure sufficient funding is recouped to cover the expenses of rehabilitation or replacement of the facilities. The development of these business plans may potentially qualify for funding under the RBDG, whose primary objectives are to provide technical assistance, training, and other activities leading to the development or expansion of small and emerging private businesses in rural areas. It is recommended for airports eligible for RBDG collaborate with MaineDOT in their applications.

## TAXIWAY WIDTHS BEYOND TAXIWAY DESIGN GROUP (TDG)

There are 25 airports in the state with taxiway widths that have at least one (1) section larger than their designated TDG and regular use requirements that do not fulfill the requirements for FAA eligibility. The *Taxiway Width Eligibility and Cost* memo recommends that airports have at least one (1) path for larger aircraft to exit the runway safely.

It is recommended during the master planning process that airports explore the financial feasibility through the four (4) different maintenance approaches in applying the right-sized justifiable action for any taxiway widths that are larger than the TDG. The *State-Wide Alternative Funding Opportunities* memo outlines the grant eligibility for airports with taxiway widths beyond the TDG. Three (3) grant and loan sources are targeted toward infrastructure projects, in which taxiways fall into this category, including the NBRC, USDA Community Facilities Direct Loan and Grant, and USDA Community Facilities Guaranteed Loan Program.

## MOWING EQUIPMENT

Obstruction and vegetation management challenges were deemed a high priority from Phase I, however mowing equipment is ineligible in the AIP program. In addition to AIP ineligibility, mowing equipment does not apply to the federal and state grants and loans as discussed in the *State-Wide Alternative Funding Opportunities* memo.

The *Low-Competing/High-Cost Projects* memo identified seven (7) mowing equipment projects and their costs in FY2023 through FY2029. The expense of mowing equipment may not be financially feasible for non-primary airports within the System. Given that MaineDOT also requires the procurement of multiple mowing units, a collective purchase of equipment led by MaineDOT may result in more favorable pricing. Bulk procurement from MaineDOT would likely reduce costs as long as the equipment is somewhat consistent. MaineDOT could save money by conducting a single bid document for the purchase of this equipment and determining the cost to each airport within the regional classifications. MaineDOT is encouraged to explore the financial feasibility of this regional approach of bulk purchasing of mowing equipment procurement as well as the potential cost savings for procuring replacement parts.

## LOW-COMPETING/HIGH-COST PROJECT ALTERNATIVE FUNDING OPPORTUNITIES

The following low-competing/high-cost projects were analyzed and if applicable, the eligible cost coverage for the state and federal grants and loans were applied to the projected cost estimates by airport:

- Terminals
- Hangars
- SRE Buildings
- SRE

**TERMINALS**

Terminal facilities are essential for the functionality of an airport in providing services for users, operators, and the public. The *Low-Competing/High-Cost Projects* memo identified 19 terminal facilities upgrades and construction projects and their costs programed into the ACIP FY2023 – FY2029.

**Table A-3** below explores the potential eligibility coverage for state and federal grant and loan opportunities for terminal facility upgrades and construction projects. Three (3) grant and loan sources, including the NBRC, the USDA Community Facilities Direct Loan and Grant, and the USDA Community Facilities Guarantee Loan Program are targeted toward infrastructure projects, in which terminal facilities fall within this category. Terminal facilities might also be eligible under the EDA grants program due to their ability to create jobs.

**Table A-3: Terminal Facilities and Upgrades Eligible Grant and Loan Funding Opportunities\***

Airport Name	ID	Current CIP*	Potential NBRC Coverage	Potential EDA Coverage	Potential Community Facilities and Direct Loan and Grant Coverage	Potential Community Facilities Guaranteed Loan Coverage
Auburn-Lewiston	LEW	\$1,680,000	\$1,000,000	\$840,000	\$0	\$620,000
Augusta State	AUG	\$3,000,000	\$1,000,000	\$1,000,000	\$450,000	\$950,000
Bangor International	BGR	\$24,580,000	\$1,000,000	\$1,000,000	\$0	\$6,345,000
Biddeford Municipal	B19	\$2,000,000	\$0	\$0	\$0	\$700,000
Caribou Municipal	CAR	\$500,000	\$400,000	\$250,000	\$275,000	\$325,000
Central Maine Airport of Norridgewock	OWK	\$2,000,000	\$1,000,000	\$1,000,000	\$1,100,000	\$700,000
Dewitt Field/Old Town Municipal	OLD	\$1,000,000	\$800,000	\$500,000	\$550,000	\$450,000
Dexter Regional	1B0	\$800,000	\$640,000	\$400,000	\$600,000	\$400,000
Eastern Slope Regional	IZG	\$3,300,000	\$1,000,000	\$1,000,000	\$2,475,000	\$1,025,000
Eastport Municipal	EPM	\$630,000	\$504,000	\$315,000	\$472,500	\$357,500
Greenville Municipal	3B1	\$150,000	\$120,000	\$75,000	\$112,500	\$150,000
Hancock County/Bar Harbor	BHB	\$2,400,000	\$1,000,000	\$0	\$1,320,000	\$800,000
Houlton International	HUL	\$285,000	\$228,000	\$142,500	\$156,750	\$242,500
Knox County Regional	RKD	\$3,517,112	\$1,000,000	\$0	\$1,934,412	\$1,079,278

Airport Name	ID	Current CIP*	Potential NBRC Coverage	Potential EDA Coverage	Potential Community Facilities and Direct Loan and Grant Coverage	Potential Community Facilities Guaranteed Loan Coverage
Lincoln Regional	LRG	\$1,850,000	\$1,000,000	\$925,000	\$1,387,500	\$662,500
Northern Aroostook Regional	FVE	\$315,000	\$252,000	\$157,500	\$236,250	\$257,500
Oxford County Regional	81B	\$1,960,460	\$1,000,000	\$980,230	\$1,470,345	\$690,115
Portland International Jetport	PWM	\$18,933,000	\$0	\$0	\$0	\$4,933,250
Presque Isle International	PQI	\$21,567,900	\$1,000,000	\$1,000,000	\$11,862,345	\$5,591,975
Princeton Municipal	PNN	\$485,000	\$388,000	\$242,500	\$363,750	\$321,250
Sanford Seacoast Regional	SFM	\$5,120,000	\$0	\$0	\$0	\$1,480,000
Sugarloaf Regional	B21	\$605,000	\$484,000	\$302,500	\$453,750	\$351,250

Source: McFarland Johnson, Inc analysis, 2024.

\*FY2022 is the ACIP reference year.

### HANGARS

Hangars are an important infrastructure component to the System, providing operational and financial support for users and opportunities for growth at many of the general aviation airports. The *Low-Competing/High-Cost Projects* memo identified 11 hangar upgrades and construction projects and their costs that have been programed into the ACIP FY2023 – FY2029.

**Table A-4** below explores the eligibility coverage for state and federal grant and loan opportunities for hangar construction programmed in the ACIP. Three (3) grant and loan sources, including the NBRC, the USDA Community Facilities Direct Loan and Grant, and the USDA Community Facilities Guarantee Loan Program are targeted toward infrastructure projects, in which hangars fall into this category. Hangars might also be eligible for two (2) grant sources (EDA and RBDG) due to their ability to create jobs.

**Table A-4: Hangar Facilities Eligible Grant and Loan Funding Opportunities\***

Airport Name	ID	Current CIP*	Potential NBRC Coverage	Potential EDA Coverage	Potential Community Facilities and Direct Loan and Grant Coverage	Potential Community Facilities Guaranteed Loan Coverage
Auburn-Lewiston	LEW	\$1,680,000	\$1,000,000	\$840,000	\$0	\$620,000

Airport Name	ID	Current CIP*	Potential NBRC Coverage	Potential EDA Coverage	Potential Community Facilities and Direct Loan and Grant Coverage	Potential Community Facilities Guaranteed Loan Coverage
Augusta State	AUG	\$3,000,000	\$1,000,000	\$1,000,000	\$450,000	\$950,000
Bangor International	BGR	\$24,580,000	\$1,000,000	\$1,000,000	\$0	\$6,345,000
Biddeford Municipal	B19	\$2,000,000	\$0	\$0	\$0	\$700,000
Caribou Municipal	CAR	\$500,000	\$400,000	\$250,000	\$275,000	\$325,000
Central Maine Airport of Norridgewock	OWK	\$2,000,000	\$1,000,000	\$1,000,000	\$1,100,000	\$700,000
Dewitt Field/Old Town Municipal	OLD	\$1,000,000	\$800,000	\$500,000	\$550,000	\$450,000
Dexter Regional	1B0	\$800,000	\$640,000	\$400,000	\$600,000	\$400,000
Eastern Slope Regional	IZG	\$3,300,000	\$1,000,000	\$1,000,000	\$2,475,000	\$1,025,000
Eastport Municipal	EPM	\$630,000	\$504,000	\$315,000	\$472,500	\$357,500
Greenville Municipal	3B1	\$150,000	\$120,000	\$75,000	\$112,500	\$150,000
Hancock County/Bar Harbor	BHB	\$2,400,000	\$1,000,000	\$0	\$1,320,000	\$800,000
Houlton International	HUL	\$285,000	\$228,000	\$142,500	\$156,750	\$242,500
Knox County Regional	RKD	\$3,517,112	\$1,000,000	\$0	\$1,934,412	\$1,079,278
Lincoln Regional	LRG	\$1,850,000	\$1,000,000	\$925,000	\$1,387,500	\$662,500
Northern Aroostook Regional	FVE	\$315,000	\$252,000	\$157,500	\$236,250	\$257,500
Oxford County Regional	81B	\$1,960,460	\$1,000,000	\$980,230	\$1,470,345	\$690,115
Portland International Jetport	PWM	\$18,933,000	\$0	\$0	\$0	\$4,933,250
Presque Isle International	PQI	\$21,567,900	\$1,000,000	\$1,000,000	\$11,862,345	\$5,591,975
Princeton Municipal	PNN	\$485,000	\$0	\$242,500	\$363,750	\$321,250
Sanford Seacoast Regional	SFM	\$5,120,000	\$1,000,000	\$0	\$0	\$1,480,000
Sugarloaf Regional	B21	\$605,000	\$484,000	\$302,500	\$453,750	\$351,250

Source: McFarland Johnson, Inc analysis, 2024.

\*FY2022 is the ACIP reference year.

### SNOW REMOVAL EQUIPMENT (SRE)

Phase I highlighted snow removal as a top priority for the SASP, encompassing equipment and plans for managing various airfield conditions. The *Low-Competing/High-Cost Projects* memo identified 12 SRE projects and their costs programed into the ACIP FY2023 – FY2029. SRE does not apply to federal and state grants and loans as discussed in the *State-Wide Alternative Funding Opportunities* memo. Similar to mowing equipment, it is recommended that MaineDOT investigate a state-wide batching program for the bulk procurement of SRE equipment as a significant cost-saving measure.

### SRE BUILDINGS

SRE buildings are crucial in having the SRE equipment reach their useful life expectancy. The *Low-Competing/High-Cost Projects* memo identified five (5) SRE Building projects and their costs programed into the ACIP FY2023 – FY2029.

**Table A-5** below explores the eligibility coverage for state and federal grant and loan opportunities of SRE buildings programed into the ACIP from FY2023 – FY2029 from the *Low-Competing/High-Cost Projects* memo. Three (3) grant and loan sources, including the NBRC, the USDA Community Facilities Direct Loan and Grant, and the USDA Community Facilities Guarantee Loan Program are targeted toward infrastructure projects, a category into which SRE buildings fall.

**Table A-5: SRE Building Grant and Loan Funding Opportunities**

Airport Name	ID	20-year CIP	Potential NBRC Coverage	Potential Community Facilities and Direct Loan and Grant Coverage	Potential Community Facilities Guaranteed Loan Coverage
Auburn-Lewiston	LEW	\$1,000,000	\$800,000	\$0	\$450,000
Bethel Regional	OB1	\$682,000	\$545,600	\$511,500	\$370,500
Eastport Municipal	EPM	\$800,000	\$640,000	\$600,000	\$600,000
Hancock County/Bar Harbor	BHB	\$2,250,000	\$1,000,000	\$1,237,500	\$562,500
Machias Valley	MVM	\$735,000	\$588,000	\$551,250	\$183,750
Presque Isle International	PQI	\$3,000,000	\$1,000,000	\$1,650,000	\$750,000

Source: McFarland Johnson, Inc analysis, 2024.

\*FY2022 is the ACIP reference year.



# Appendix B: Performance Metrics and Standards

Sponsor Performance Metrics

B-1 – B-10

Minimum Facility and Service Requirements

B-11 – B-29



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## MEMORANDUM

**TO:** Maine Department of Transportation

**FROM:** McFarland Johnson, Inc

**DATE:** February 5, 2024

**SUBJECT:** Sponsor Performance Metrics

**PROJECT NO.:** MaineDOT WIN# 018717.03; MJ# 19008.00

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### Introduction

The purpose of this memorandum is to provide MaineDOT with a set of recommended sponsor management, maintenance, and activity objectives for improved facility performance throughout the system. The recommendations will allow MaineDOT to identify sponsors who need support and resources to reach these objectives. This memorandum will also provide MaineDOT with a list of resources and recommendations to source the information necessary to measure the following criteria set:

- Status of SASP airports' current FAA-approved Master Plans and/or Airport Layout Plans
- Pavement Condition & Maintenance
- Fueling System and/or Equipment Condition & Maintenance
- Weather Reporting Equipment Condition & Maintenance
- Clear Approaches/ Obstruction Removal/Vegetation Management
- Snow Removal and Deicing Equipment Condition & Maintenance
- Airfield Lighting/Navigational Aids Condition & Maintenance
- Financial Sustainability
- History of Sponsor-Match Funding Participation
- Sponsor Project Performance Period
- Sponsor Project Communication
- Activity Reporting (GARD participation)
- Economic Relevance and Engagement

Further details on the categories will be provided in the following sections.

## 1. Status of SASP airport's current FAA-Approved Master Plans and ALPs

The objective of the Maintain a Current FAA-Approved Master Plan and Airport Layout Plan (ALP) metric is to ensure airports have clear direction to address current standards and requirements of their facility in a sustainable manner.

The FAA recommends that airport sponsors have an Airport Layout Plan (ALP) updated every six (6) to ten (10) years. An airport master plan provides a road map for efficiently meeting aviation demand through the foreseeable future while preserving the flexibility necessary to respond to changing industry conditions. Substantial savings can be realized with proper vetting of triggers, standards, and alternatives anticipated within the planning period. Establishment of a clear path and purpose along with realistic estimates will prepare sponsors with a guiding document.

Following an ALP or planning effort, sponsors should create a strategic business plan identifying how to achieve the recommendations. Within the implementation document, the business/financial plan will identify key milestones, funding sources, and the deadlines to achieve financial support.

## 2. Pavement Condition and Maintenance

The objective of the Pavement Condition and Maintenance metric is to promote a culture of maintenance and encourage airports to achieve the highest marks. If an airport can identify, monitor and maintain the pavement condition at a high level of service, the pavement will deteriorate at a lower rate, thus maintaining the safety of the airfield and leading to less of a financial burden throughout the System of Airports.

MaineDOT conducts a statewide Pavement Condition Index (PCI) study every 3-5 years in accordance with the FAA recommendations. This is a financial investment at no cost to individual sponsor airport with the objective of supporting system airports in meeting FAA grant assurance requirements. The PCI is a numerical indicator that rates the structural integrity and surface condition of the pavement by assigning a value of 0 – 100, with 100 being the highest and representing conditions of newly-installed pavement. The PCI value is determined by standard industry practices that measure the type, severity, and quantity of distress such as cracking and weathering. The PCI score is utilized to determine the maintenance and repair needs for the airport pavement through either Preventive Maintenance (100 - 71); Major Rehabilitation (70 – 60) or Reconstruction (59 or less). The current PCI and rate of deterioration are projected as a planning measure to identify future maintenance and repair needs for the pavement.

MaineDOT will continue to conduct this statewide initiative as it standardizes, streamlines, and captures the PCI of the general aviation (GA) airports. The results of each facility's study provide recommendations for how to address the distresses and estimated costs. Furthermore, these studies are the catalyst for each sponsor to develop a Pavement Management Plan (PMP) and thus ensuring they meet the necessary PMP requirements for FAA grant assurances. In addition, the PMP outlines how each airport will directly address the distresses with the development of a Capital Improvement Plan (CIP) specific for pavement maintenance.

Although the PCI numbers will inevitably decrease over time, adequate planning and maintenance from the sponsor and the State of Maine can aid in the impediment of the deterioration of the pavement and protect the local state and federal investments of the facility.

The State's Pavement Management Plan (PMP), inclusive of all the System of Airports PCI studies, is only one part in implementing the recommendations from the studies. The sponsor is accountable in working towards the recommendations of pavement maintenance and repair needs for their facility. The sponsor's performance of these recommendations will be measured by their participation, documentation, and actionable follow-up in a timely manner. Even if the recommendations might not be able to be performed in the current fiscal environment, it is important that the sponsor puts in good-faith effort to acknowledge, monitor, and work towards a solution to the pavement mediation recommendations. Documentation can be preserved through the use of a traditional binder, or an electronic filing system. Logs or documentation consisting of receipts of materials, labor, project closeout documentation, or certification records should be available upon request. Projects that are unable to be performed during the anticipated time period may be communicated to MaineDOT to identify potential support. Additionally, it is recommended that the sponsor perform routine checks to monitor the conditions of the pavement to ensure the safety of the airfield.

### 3. Fueling System and/or Equipment Condition & Maintenance

The objective of the Fueling System and/or Equipment Condition & Maintenance metric is to promote a financially sustainable approach to provide valuable fueling services statewide.

Operational fueling systems are a critical component for the continual operation of the State's System of Airports. They also have the potential for significant environmental hazards and safety risk if not properly maintained and tested. Maine Department of Environmental Protection (MaineDEP) manages the monitoring and condition testing of the tanks in terms of environmental sensitivity.

Operational agreements with 3<sup>rd</sup> party providers are considered the most ideal solution where the private sector participates in the airport's infrastructure and still provides some source of revenue for the airport through flowage fees. However, not all airport facilities lend themselves to private investment due to low activity and volumes.

FAA funding for public fueling systems is only available at the initial implementation of the system. Afterward, it is up to the sponsor to adequately plan and manage the system's costs for the inevitable funding needed for the maintenance and replacement of the system once it has reached its useful life expectancy. It is recommended that the sponsor establishes a business analysis or business plan that is inclusive of the cost factors of the current rates, maintenance, and the future fueling system replacement costs to help ensure that there is enough funding recovered to pay for a new system when required in the future.

MaineDOT is aware of the obstacles that some sponsors might face in the implementation of the business plan. The current operational framework including the competitive market surrounding airport's fuel pricing, as well as privately-owned operations can create challenges to this implementation. It is recommended that further analysis be conducted by MaineDOT regarding the viability of a required fuel system business plan implemented on a statewide level due to

unintentional market consequences. If sponsor-owned and operated facilities are encouraged to raise prices in an effort to recover costs, this may result in an unintentional undercutting of publicly-run fueling systems by the private sector or a reduction in the use of the system due to rising fuel costs.

MaineDOT should develop a business plan for a single airport to determine the necessary fueling upcharge in order to meet this requirement. It should then evaluate which airports are currently meeting this value within the State. The analysis should review the private sector to determine if/how their systems are profitable and whether requiring the implementation of business plan recommendations on sponsor-operated systems will create an unnecessary disruption to the aviation fuel sales market. The business plan could be used as a sample document that can be shared with sponsors to model their own fueling operations.

#### **4. Weather Reporting Equipment Condition & Maintenance**

The Automated Surface/Weather Observing Systems (ASOS/AWOS) are units that are operated and controlled by the FAA, National Weather Service, and the Department of Defense. Because sponsors have minimal responsibility concerning weather systems, this is not a feasible metric to apply. Implementation of the new statewide AWOS installation should clearly identify who is responsible for and the anticipated costs.

#### **5. Clear Approaches/Obstruction Removal/ Vegetation Management**

The objective of the Clear Approaches, Obstruction Removal, and Vegetation Management metric is to promote airport operational safety through sustainable maintenance and good housekeeping practices.

##### **Organization and Identification of Existing Conditions**

The data collection and classification of obstruction is provided within the FAA Airports Data and Information Portal (ADIP). Each sponsor should review this database and verify if the existing database reflects current conditions and has incorporated obstruction removal work conducted to date. Actively updating and maintaining data in ADIP is recommended by FAA and is an important part in communicating the existing conditions of the airport with FAA.

##### **Actionable Implementation Plan**

Each sponsor should identify a realistic and actionable implementation plan to address the obstructions identified. Not all vegetation requires active management. Each airport should create a written plan with supporting graphics to identify the management required for specific areas of the airport. This plan should include strategic practices that will position the airport favorably for future permitting efforts and limit frequency to reduce operational costs, and ware on equipment in an effort to promote sustainability. Larger efforts that require capital improvements such as clearing with heavy machinery; obtaining avigation easements; and application of permits should be identified and incorporated into the sponsor's CIP.

Ongoing maintenance practices should be documented to identify the frequency of maintenance. This could be established through simple maintenance logs. Similar to recommendations in previous sections, the use of a traditional binder, or electronic filing system with action plans,

permits, aviation easement documentation, and maintenance logs can be used by sponsors to provide validation of their good-faith effort.

Within the plan, a review of existing equipment and staffing needs should also be conducted to ensure the sponsors have the ability to implement their actionable plan. MaineDOT may be able to support the procurement of equipment statewide with in an effort to reduce costs through an economy of scale and cost sharing. Sponsor maintenance of equipment would reflect the requirements identified for Snow Removal Equipment procurement below.

## 6. Snow Removal and Deicing Equipment Condition & Maintenance

The objective of the Snow Removal and Deicing Equipment Condition & Maintenance metric is to promote airport operational safety through sustainable maintenance practices.

Although FAA considers snow removal equipment (SRE) to be eligible every 10 years, it is recommended to avoid preventable procurement of equipment in an effort to focus funding on other needs. Since the equipment only gets used partially throughout the year, the equipment has low mileage and low hours of operation; it may be feasible to extend the life of the equipment further with proper maintenance and storage. MaineDOT and FAA help fund the storage of the equipment, thus the responsibility of routine maintenance and care falls onto the sponsor to protect the investment of the State and the FAA.

With maintenance requirements much like a common auto lease agreement, there are mandatory service milestones for preventative maintenance such as oil and transmission changes, inspections, and minor repairs. Manufacturers also have recommended service and preventative maintenance milestones to provide guidance to sponsors. Conducting the preventative maintenance during the summer months will ensure that the equipment is operational during the winter months. Service logs and documentation of maintenance on the snow removal equipment should be consolidated into the binder or electronic filing system for review.

The condition of the snow removal equipment storage facility is also a key component in the maintenance of the equipment. If a storage facility or shelter begins to fail, the equipment can be negatively impacted, and the lifespan of the equipment can decrease. In addition to the records of the snow removal equipment, a condition assessment of the storage facility should also be compiled into the sponsor's binder or electronic filing system to assess the overall condition and maintenance of snow removal equipment at each airport.

The other challenge that sponsors may have with the implementation of their snow removal activities is that each airport experiences a different mix of weather which also varies based upon the type of storm. There is no single approach that will fit all airports for all storm conditions. That is why a snow removal best management practices for the variety of snow conditions should be reviewed by staff on a yearly basis. General aviation airports within the State do not have a comprehensive Snow and Ice Plans as it is not required by the FAA for these designated asset roles. It is recommended that MaineDOT perform educational outreach to the general aviation airports to provide guidance for the sponsors to create a plan that is specific for their Airport. This can be performed by MaineDOT on an annual basis through an in-person or webinar that all

airports are encouraged to attend similar to the Airport Winter Safety Operations Meetings (Airport Snow and Ice Control Committees) from AC 150/5200-30D. Additionally, the FAA has supported the installation of weather cameras which also provide a view of the condition of the runway, which may be a viable source of information to conduct periodic remote inspections.

By eliminating barriers both financially and with education, the level of service during inclement weather events is likely to improve. With MaineDOT's encouragement to actively participate, manage and document their approach, MaineDOT's investment of both time and financial resources are likely to prove well-vested.

## 7. Airfield Lighting/Navigational Aids Condition and Maintenance

The objective of the Airfield Lighting/Navigational Aids Condition and Maintenance metric is to promote airport operational safety with improved level of service through sustainable maintenance practices.

Airfield lighting and navigational aids (NAVAIDs) are critical to the safety of the airfield and aviation operations. The FAA is a valuable partner and owns and maintains several NAVAID systems throughout the State. It is important that the sponsor regularly inspects and monitors the condition of the equipment and timely rectifies, if needed, any and all conditions of the equipment. Similar to recommendations in previous sections, the use of a traditional binder, or electronic filing system with records of inspection, routine maintenance and active plans to address deficiencies is a best practice to document the good-faith effort.

MaineDOT is aware of the obstacles that some sponsors might face with the availability of adequately trained electrical technicians in the specialized skill set that are required for airfield lighting as well as the challenges in procuring replacement parts. MaineDOT can facilitate collaboration between sponsors in communication of airfield electrical demolition projects in order to acquire salvaged equipment; advisement on the procurement of spare parts; and knowledge sharing initiatives to address sponsor challenges.

## 8. Financial Sustainability

The objective of the Financial Sustainability metric is to alleviate the burden of airport operational and maintenance costs from the local community, enabling airports to receive support for local match funding when necessary for improvements.

With so much emphasis on determining how to fund capital improvement costs, there is little financial support for the on-going maintenance and operation of the facilities. If a facility is a continual financial burden on the sponsor community, it makes it much more difficult to support a local match when the time is necessary.

Financial sustainability may have always been a goal for general aviation facilities, but readily available opportunities were few and far between to make this goal realistic for all facilities. This may still be the case for some general aviation airports, but MaineDOT is emphasizing the importance of making this a priority for system airports and should be a key objective during master planning efforts.

With support from MaineDOT, each general aviation facility will be encouraged to develop a business plan focusing on how to become financially sustainable. This can be reasonably completed when paired as a follow-up effort with a master plan process. To address these concerns, it is recommended that future master plan updates incorporate business plan elements that include comprehensive financial data collection and review. Furthermore, MaineDOT should support the development of business plans at each airport, focusing on lease structure and cost recovery. Anecdotal challenges raised by sponsors, such as realistic fair market value rates for leases, indicate the need for a concerted effort statewide.

Currently, airport sponsors find themselves undercut by neighboring facilities that offer significantly lower rates. Similar challenges arise with fuel sales, as airports struggle to upcharge to cover the cost of fuel systems when competitors charge less to attract business. Taking a system-wide perspective, it is imperative to review revenue-generating sources through the lens of achieving financial stability for every airport. MaineDOT can track rates, charges, and trends across the system for the baseline establishment of fair market value.

## 9. History of Sponsor-Match Funding Participation

The objective of the [History of Sponsor-Match Funding Participation](#) metric is to ensure airports are accountable for their financial commitment and to increase awareness of their Airports CIP needs and cost associated with the projects.

There is a significant amount of coordination conducted amongst MaineDOT, FAA, and consultants to program funding for anticipated projects. When sponsors don't secure the local funds, not only is it a waste of time, but it results in a loss of grant funding that could have been programmed elsewhere. This impacts the MaineDOT Work Plan and affects other forms of transportation.

It is recommended that MaineDOT develop a list of airports with a good history of grant matching, as well as a history of good communication on grant matching. Understanding that unforeseen circumstances do occur and can affect the ability for a sponsor to acquire their portion of grant matching. It should be noted when communication of those circumstances between the sponsor and the State is maintained, and sponsors should not be penalized. Conversely, when sponsors do not communicate with the State and FAA, and also do not have a longstanding history of grant matching, it should be identified and flagged when future projects and grant funding eligibility is being determined.

Measures can be implemented such as requiring proof of sponsor match prior to programming a grant, but that may be unrealistic for local municipalities to approve expenditures beyond their approved fiscal year budgets. And because the timing of the grant cycle may not coincide with municipality meetings, some sponsors are not able to formally secure the funding until after the grant application has been submitted. A strategic, financial business plan should identify the impediments and provide solutions listed in the section above.

Most sponsors are able to navigate the current system without flaw. The sponsors who may reject a grant due to lack of funding match should be formally identified to work with MaineDOT to develop an appropriate grant procedure that fits within the sponsor's parameters moving forward.



## 10. Sponsor Project Performance Period

The objective of the Sponsor Project Performance Period metric is to encourage a culture within sponsors to close out completed projects in a timely fashion.

Lagging grant closures create a financial burden on the system. MaineDOT matching funds and unused entitlement funds are obligated to the grant until closeout. Unused entitlements get reallocated to the sponsor, while expiring entitlements get rolled into discretionary funding. With grant reporting requirements and general management of an open grant, projects costs are incurred as well during low activity periods. Notification should be made to the FAA and the MaineDOT of project closure within a specified designated time-period established with MaineDOT.

Establishing a culture for sponsors to quickly closeout grants once it is completed will help alleviate these challenges. Grant performance can be easily measured and tracked through the awarded grants schedule and project closeout date. Any projects that extend beyond six months of substantial completion should be flagged as a cause for concern. By implementing this approach, MaineDOT can maintain better oversight of project timelines and take proactive measures to address potential delays or extended periods between completion and closeout. This ensures timely and efficient utilization of funds, minimizes cost fluctuations, and fosters accountability within the project management process.

## 11. Sponsor Project Communication

The objective of the Sponsor Project Communication metric is to foster an environment that encourages the sponsor and MaineDOT to maintain consistent and timely communication of project milestones.

Communication is frequently identified as the most important element in successful collaboration allowing projects to progress smoothly and timely. It increases engagement and reduces conflict. With the aim of enhancing efficiency in project management while staying well-informed, it is recommended that MaineDOT right-size its involvement in projects. It is recommended that MaineDOT establish a strategic list of milestones for sponsors to involve MaineDOT in the process, from CIP through project closeout and distribute to sponsors and consultants. Furthermore, establishing reporting standards and utilizing existing programs such as FAA grant reports will help streamline the process. These strategic milestones could provide a structured framework for monitoring the various stages of project development and establish a quantitative method for evaluating the sponsor's performance in communication.

It is recommended communication milestones be reviewed during project scoping or sponsor's annual CIP meetings. It is recommended that sponsors take a proactive approach if unforeseen issues arise during the project's implementation communicating with MaineDOT of any substantial changes from the original timeline.

## 12. Activity Reporting (GARD Participation)

The objective of the Activity Reporting (GARD Participation) metric is to enable MaineDOT to have a regular overview of airport operations and identify any emerging trends or issues.

MaineDOT has supported the implementation of the General Audio Recording Device (GARD) system at airports over the years with variable participation rates. The GARD reporting system has been proven instrumental in enhancing data collection, analysis, and decision-making processes for airport management. The availability of accurate and up-to-date information through the GARD system has empowered MaineDOT to make informed decisions and allocate resources effectively. As a finding from Phase I of the Maine State Aviation System Plan (MSASP), MaineDOT is charged with tracking the use of the program within the System of Airports. With recent investment, MaineDOT provided 100% funding to upgrade to the new GARD system which incorporated ADS-B capability and received 100% participation rates at general aviation airports.

To support the ever-changing airport management staff in effectively developing monthly reports and utilizing the data provided, it is highly recommended that MaineDOT offers comprehensive training materials and/or training videos. These resources will play a vital role in equipping airport personnel with the necessary knowledge and skills to navigate the reporting process with confidence. The training materials should cover the GARD system's functionalities, data entry guidelines, and monthly reporting requirements. By providing clear instructions and best practices, MaineDOT can promote consistent and accurate reporting across all airports. Additionally, providing certificates and continual education sessions hosted by sponsors, a culture of knowledge sharing can be established.

## 13. Economic Relevance and Engagement

The objective of the Economic Relevance and Engagement metric is to foster a culture that actively promotes economic activity within the surrounding community.

Every airport within the State of Maine System of Airports serves a distinctive purpose to their community. It is essential that the sponsor understands the drivers of their aviation activity inclusive of community and passenger profiles, economic activities, local government operations and essential functions serving its population beyond the limits of the airport.

The active engagement of the sponsor within the community is critical to the success of the airport. The sponsor is encouraged to openly communicate and proactively participate in the promotion of airport activities; show a willingness to explore suitable business opportunities; identify areas that can be optimized for growth; and seek out alternative funding sources for development. Engagement is qualitatively measured by the sponsors open communication with MaineDOT.

MaineDOT can provide support and resources that may be needed in these engagement efforts such as letters of support; identification of funding sources; and facilitation of collaboration with state agency partners.

## Summary

This memorandum outlined a set of minimum sponsor management, maintenance, and activity objectives for the enhancement of the overall level of service and safety of airport facilities in the State of Maine. These metrics will be the guiding principles in the promotion of a culture of safety, efficiency, communication, and sustainability for airport sponsors based upon measurable criteria when applicable.

MaineDOT can reinforce the importance of these recommendations with a State-funded program. Cost sharing may be established based on past performance and merit-based criteria. The implementation of this merit-based metric system will incentivize sponsors to achieve the desired outcome. By documenting and demonstrating their efforts to meet the criteria, sponsors can earn eligibility for financial support through MaineDOT. MaineDOT will track and assess sponsor performance based on documentation, implementation of plans, and adherence to recommended practices.

Overall, this memorandum serves as a guide for MaineDOT to promote responsible management and maintenance practices among airport sponsors with incentive associated with financial cost sharing.



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## MEMORANDUM

**TO:** Maine Department of Transportation  
**FROM:** McFarland Johnson, Inc.  
**DATE:** February 2024  
**SUBJECT:** Minimum Facility and Service Requirements  
**PROJECT NO.:** MaineDOT WIN# 018717.03; MJ# 19008.00

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### INTRODUCTION

This memorandum outlines the minimum standards for facility requirements in the state of Maine. The standards are based on the types of aeronautical functions serving the public interest. The intent is to provide the Maine Department of Transportation (MaineDOT) with the basic facility requirements at each airport. The information included in this memorandum is based on the definitions of functions by the State of Maine, the Federal Aviation Administration (FAA) runway and taxiway requirements provided in FAA Advisory Circular (AC) 150/5300-13B, *Airport Design*, and a list of state-owned aircraft provided by MaineDOT.

To develop the minimum standards for the state's functions, it is important to understand the state-serving functions. There have been thirty state functions identified, but only ten (10) fit into the Emergency Preparedness and Response, and Critical Community Access categories on which the state places a higher emphasis. Within the two (2) categories are the following functions:

#### Emergency Preparedness and Response:

- Aeromedical Flights
- Law Enforcement/National Security/Border Security
- Emergency Response
- Aerial Fire Fighting and Support
- Emergency Diversionary Airport
- Disaster Relief and Search and Rescue
- Critical Federal Functions

#### Critical Community Access

- Remote Population/ Island Access
- Air Taxi/ Charter Services
- Essential Air Service Cargo

## STATE FUNCTION SELECTION

All 35 airports within the System Plan were sent a survey as part of the study. The results of the survey indicated that aeromedical flights are present at all airports within the study. The state functions have been sourced from the FAA's *General Aviation Airports: A National Asset* document and defines aeromedical flights as the use of an aircraft in transportation, for carriage of ambulatory or other patients requiring special care, including Basic and Advance Life Support, during flight, and/or transport of body organs. Based on the state function list and the survey results, the Aeromedical Flights category is used as the function for determining the minimum facility requirements.

## BASIS OF DESIGN

To further define the minimum facility requirements of aeromedical flights, LifeFlight of Maine (LifeFlight), the primary aeromedical provider in the state, was contacted to determine critical aircraft. LifeFlight operates a Beechcraft King Air BE20 (BE20). The BE20 has been selected as the critical aircraft to which airport standards should attempt to meet.

LifeFlight was also contacted to determine the minimum runway length and width, taxiway system, approach requirements, snow removal needs, and deicing requirements. In addition to the needs of LifeFlight, the study also assessed facilities including onsite weather reporting systems, publicly accessible facilities, and fuel services.

LifeFlight provided the information in **Table 1** related to runway, apron, and taxiway requirements. LifeFlight utilizes a 'percent solution' grading system to compare how an airport meets its requirements.

FAA AC 150/5300-13B designates the BE20 as a "B-II" aircraft based on the Aircraft Approach Category (AAC) and Airplane Design Group (ADG). Additionally, LifeFlight has noted that elevation plays a pivotal role in runway length and has included takeoff and landing penalties that should be applied to runway lengths depending on the airport elevation. LifeFlight has indicated a 75-foot-wide runway will meet their needs for operations, which is consistent with FAA AC 150/5200-13B which prescribes a runway width of 75 feet for a "B-II" aircraft with visibility minimums 'not lower than  $\frac{3}{4}$ -mile'.

To estimate the apron space requirements the study considered the aircraft parking envelope and maneuvering of LifeFlight's BE20 aircraft. The minimum requirement is to park one (1) BE20 aircraft at 3,145 square feet (sf) per information published in FAA's Aircraft Characteristics Database.

FAA AC 150/5300-13B designates the BE20 as a Taxiway Design Group (TDG) "2A" based on the BE20's wheel configuration. This results in a 35-foot-wide taxiway. The taxiway requirements listed in **Table 1** indicate the recommended taxiway configurations, which range from a "dog bone" or a runway end with additional pavement that allows a pilot to make a 360-degree turn on a runway end, similar in appearance to a dog bone, to a "jug handle" which involves a portion of pavement adjacent to one side of a runway end that also allows a pilot to make a 360-degree turn at a runway end and resembles a jug handle, to a full-length taxiway consistent with FAA recommended taxiway geometry. Entrance/exit taxiways are defined as taxiways providing access to and from the active runway.

**Table 1: Runway, Apron, and Taxiway Minimum Requirements**

Grade	Grading	Length (ft.)	Width (ft.)	Apron (sf)	Taxiways
4.0	100% Solution	4,200 - 5,000	75	14,497 sf (two aircraft and taxilane)	Full-Length Taxiway
3.0	90% Solution	4,200	75	7,289 (one aircraft and taxilane)	Partial taxiway turnaround, Jug Handles, Stub connector on one end, or full/partial taxiway turnarounds
2.0	80% Solution	4,000 – 4,199	75	3,145 (one aircraft)	Partial taxiway turnaround, Jug Handles, Stub connector on one end, or full/partial taxiway turnarounds
1.0	70% Solution	3,600-3,999	75	≥ 3,145	No End Connector, Grass Field

Source: McFarland Johnson, Inc. analysis, 2024 based on LifeFlight's aircraft which is a Beechcraft King Air BE20.

20-foot takeoff penalty per 100- feet of elevation

10-foot landing penalty per 100 feet of elevation

In addition to the runway pavement configuration, the facilities at an airfield also impact LifeFlight's operations, particularly at airports with instrument approaches where the lighting system installed on the approach end of the runways aids in operational efficiency at night and in low visibility conditions (i.e. fog). These systems enhance the safety of the aircraft operations to the airport. The runway approach lighting classifications are included in **Table 2** with the categories of Runway End Identifier Lights (REILs), Medium Intensity Runway Lights (MIRLs), High-Intensity Runway Lights (HIRL), Medium Intensity Approach Lighting System (MALSF), Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) and Approach Lighting System with Sequenced Flashing Lights (ALSF).

Listed in **Table 2** is also a requirement for equipment for Visual Glide Slope Indicators (VGSI), that provide visual guidance for pilots landing on a runway. Precision Approach Path Indicators (PAPI) and Visual Approach Path Indicators (VASI) are the types of VGSI listed.

Weather reporting equipment installed on or around an airport provides important information to pilots. Weather information can be the deciding factor between a go and no-go operation. LifeFlight provided the systems that indicated the minimum required equipment for the weather reporting equipment at an airport, ranging from a nearby weather source camera to an Automated Weather Observing System (AWOS-3P), Automatic Terminal Information Systems (ATIS), and Runway Visual Range (RVR) sensors.

Lastly, LifeFlight provided a breakdown of the Snow Removal Equipment (SRE) needed during winter months for the safety and operational efficiency of aircraft operations during snow and ice events.

**Table 2: Approaches, Runway Approach Lighting, VGSI, Weather Reporting, SRE Equipment Minimum Requirements**

Grade	Grading	Approaches (both directions)	Runway/ Approach Lighting	VGSI	Weather Reporting	SRE Equipment
4.0	100% Solution	LP MDA, LP, LPV, LNAV+V, ILS	REILS, HIRLS, ALSF with sequencing flashers (Rabbit)	PAPI/VASI	RVR sensors, ATIS, AWOS-3P, Forecasting	Chemical runway program, 24-hour Snow Removal. Plow/Broom/Blower
3.0	90% Solution	LP MDA, LP, LPV, LNAV+V	REILS, HIRLS, MALSF/MALSR	PAPI/VASI	AWOS-3, Camera	Plow/Broom/Blower
2.0	80% Solution	LP MDA, LP, LPV, LNAV+V	REILS, MIRLS	PAPI/VASI	AWOS-AV, Camera	Plow/Broom/Blower
1.0	70% Solution	LNAV (advisory vertical guidance strongly desired)	REILS, MIRLS		Nearby Weather Source, Camera	Plow, Boom Pref., Blower Preferred

Source: McFarland Johnson, Inc., analysis, 2024.

**RUNWAY REQUIREMENTS**

An analysis of the state’s public airports and their runway facilities was conducted to determine if the runway pavements meet the minimum requirements detailed in **Table 3**. The analysis looked at the existing runway facilities and applied the take-off penalties for airport elevation. The penalty accounts for the normal take-off and landing conditions that are affected by the elevation of the runway. **Table 3** shows the results of the runway length and width analysis.

The minimum runway length required to operate the BE20 is 3,600 feet and thus was selected as the minimum requirement. A runway length analysis was conducted in accordance with the FAA’s Small Aircraft Runway Length Analysis Tool (SARLAT). The analysis supports the 3,600-foot runway estimated by LifeFlight.

**Table 3: Runway Analysis – Existing and Shortfalls**

Airport Name	Existing Runway Length (ft.)	Existing Runway Width (ft.)	Runway Length with Penalty (ft.)	Shortfall to Minimum Runway Length (ft.)	Shortfall to Minimum Runway Width <sup>1</sup> (ft.)
Bangor International Airport (BGR)	11,440	200	11,420	N/A	N/A
Brunswick Executive Airport (BXM)	8,000	200	8,000	N/A	N/A
Presque Isle International Airport (PQI)	7,441	150	7,341	N/A	N/A
Portland International Jetport (PWM)	7,200	150	7,200	N/A	N/A
Sanford Seacoast Regional Airport (SFM)	6,389	100	6,349	N/A	N/A
Waterville Airport (WVL)	5,500	100	5,440	N/A	N/A
Knox County Regional Airport (RKD)	5,412	100	5,412	N/A	N/A
Hancock County-Bar Harbor Airport (BHB)	5,200	100	5,200	N/A	N/A
Auburn-Lewiston Municipal (LEW)	5,001	100	4,961	N/A	N/A
Augusta State Airport (AUG)	5,002	100	4,942	N/A	N/A
Houlton International Airport (HUL)	5,015	100	4,935	N/A	N/A
Millinocket Municipal Airport (MLT)	4,713	99	4,633	N/A	N/A
Northern Aroostook Regional Airport (FVE)	4,600	75	4,420	N/A	N/A
Eastern Slope Regional Airport (IZG)	4,200	75	4,120	N/A	N/A
Eastport Municipal Airport (EPM)	4,002	75	4,002	N/A	N/A
Stephen A. Bean Municipal Airport (8B0)	4,299	75	3,939	N/A	N/A
Pittsfield Airport (2B7)	4,003	100	3,983	N/A	N/A
Dewitt Field Old Town Municipal Airport (OLD)	4,001	75	3,981	N/A	N/A



Airport Name	Existing Runway Length (ft.)	Existing Runway Width (ft.)	Runway Length with Penalty (ft.)	Shortfall to Minimum Runway Length (ft.)	Shortfall to Minimum Runway Width <sup>1</sup> (ft.)
Belfast Municipal Airport (BST)	4,000	100	3,980	N/A	N/A
Central Maine Regional Airport (OWK)	4,000	100	3,960	N/A	N/A
Caribou Municipal Airport (CAR)	4,003	100	3,883	N/A	N/A
Greenville Municipal Airport (3B1)	4,000	75	3,720	N/A	N/A
Princeton Municipal Airport (PNN)	3,998	75	3,958	N/A	N/A
Bethel Regional Airport (OB1)	3,818	75	3,698	N/A	N/A
Newton Field Airport (59B)	3,601	75	3,381	219	N/A
Wiscasset Municipal Airport (IWI)	3,397	75	3,397	203	N/A
Biddeford Municipal Airport (B19)	3,000	75	2,980	620	N/A
Oxford County Regional Airport (81B)	2,997	75	2,937	663	N/A
Dexter Regional Airport (1B0)	3,008	75	2,908	692	N/A
Charles A. Chase Jr. Memorial Airport (44B)	2,926	75	2,826	774	N/A
Machias Valley Airport (MVM)	2,880	60	2,880	720	15
Lincoln Regional Airport (LRG)	2,805	60	2,765	836	15
Sugarloaf Regional Airport (B21)	2,797	75	2,637	963	N/A
Islesboro Airport (57B)	2,400	50	2,400	1,200	25
Stonington Municipal Airport (93B)	2,099	60	2,099	1,501	15

Source: McFarland Johnson, Inc. analysis, 2024.

Note(s) : Airports identified as having existing visibility minimums 'not lower than ¾ mile'. Thus, requiring up to a 75-foot wide runway.

The results of the runway length and width analysis show that eleven (11) airports do not have runways that meet the minimum requirements for either runway width or length for an aeromedical operator such as LifeFlight or a similar operator. **Table 4** provides a breakdown of the runway length and width shortfalls, and the estimated costs associated to bring the runway up to the specifications required to meet the minimum standards.

**Table 4: Runway Analysis – Shortfall Minimum Requirements and Costs**

Airport Name	Shortfall to Minimum Runway Length (ft.)	Shortfall to Minimum Runway Width (ft.)	Runway Length Costs to Meet Minimum	Runway Width Costs to Meet Minimum
Stonington Municipal Airport (93B)	1,501	15	\$3,670,000	\$7,160,000
Sugarloaf Regional Airport (B21)	963	N/A	\$2,851,000	N/A
Islesboro Airport (57B)	1,200	25	\$2,315,000	\$7,160,000
Charles A. Chase Jr. Memorial Airport (44B)	774	N/A	\$2,232,000	N/A
Dexter Regional Airport (1B0)	692	N/A	\$1,972,000	N/A
Lincoln Regional Airport (LRG)	836	15	\$1,900,000	\$7,161,000
Oxford County Regional Airport (81B)	663	N/A	\$1,882,000	N/A
Biddeford Municipal Airport (B19)	620	N/A	\$1,749,000	N/A
Machias Valley Airport (MVM)	720	15	\$1,615,000	\$7,160,000
Newton Field Airport (59B)	219	N/A	\$582,000	N/A
Wiscasset Municipal Airport (IWI)	203	N/A	\$538,000	N/A

Source: McFarland Johnson, Inc., analysis 2024.

**APRON REQUIREMENTS**

An analysis of the state's public airports and their apron facilities was conducted to assess whether the apron pavements meet the minimum requirements for operational capabilities for LifeFlight and similar operators. The study assumes one (1) BE20 aircraft will need to be parked. Therefore, the study selected the standard of parking one (1) BE20 aircraft as the minimum requirement. This standard requires 3,145 sf of paved parking to support the BE20. The results of the analysis are presented in **Table 5** below.

**Table 5: Apron Analysis – Results**

Airport Name	Existing Largest Parking Envelope (sf)	Shortfall to Minimum Apron
Bangor International Airport (BGR)	1,414,449	N/A
Brunswick Executive Airport (BXM)	526,070	N/A
Knox County Regional Airport (RKD)	453,031	N/A
Portland International Jetport (PWM)	429,164	N/A
Sanford Seacoast Regional Airport (SFM)	291,350	N/A
Hancock County-Bar Harbor Airport (BHB)	237,465	N/A
Augusta State Airport (AUG)	228,710	N/A
Oxford County Regional Airport (81-B)	218,202	N/A
Houlton International Airport (HUL)	189,309	N/A
Auburn-Lewiston Municipal Airport (LEW)	164,297	N/A
Wiscasset Municipal Airport (IWI)	159,347	N/A
Eastern Slope Regional Airport (IZG)	150,925	N/A
Bethel Regional Airport (OB1)	138,544	N/A
Presque Isle International Airport (PQI)	107,500	N/A
Pittsfield Airport (2B7)	97,027	N/A
Waterville Airport (WVL)	91,616	N/A
Belfast Municipal Airport (BST)	84,478	N/A
Dewitt Field Old Town Municipal Airport (OLD)	76,407	N/A
Sugarloaf Regional Airport (B21)	62,250	N/A
Biddeford Municipal Airport (B19)	51,127	N/A
Central Maine Regional Airport (OWK)	48,477	N/A
Greenville Municipal Airport (3B1)	43,019	N/A
Caribou Municipal Airport (CAR)	39,662	N/A
Newton Field Airport (59B)	35,404	N/A
Lincoln Regional Airport (LRG)	34,974	N/A
Machias Valley Airport (MVM)	34,852	N/A
Princeton Municipal Airport (PNN)	33,793	N/A
Millinocket Municipal Airport (MLT)	31,812	N/A
Dexter Regional Airport (1B0)	27,532	N/A
Northern Aroostook Regional Airport (FVE)	26,870	N/A
Islesboro Airport (57B)	25,450	N/A
Stephen A. Bean Municipal Airport (8B0)	24,067	N/A
Eastport Municipal Airport (EPM)	10,322	N/A
Charles A. Chase Jr. Memorial Airport (44B)	0	3,145
Stonington Municipal Airport (93B)	0	3,145

Source: McFarland Johnson, Inc., analysis, 2024.

The results of the apron analysis indicate that two (2) airports do not have apron facilities that meet the minimum requirements for an aeromedical operator such as LifeFlight. **Table 6** provides the apron shortfalls and the necessary pavement costs to meet the minimum requirements.

**Table 6: Apron Analysis – Shortfall to Minimum Requirements and Costs**

Airport Name	Shortfall to Minimum Apron (sf)	Apron Costs to Meet Minimum
Charles A. Chase Jr. Memorial Airport (44B)	3,145	N/A
Stonington Municipal Airport (93B)	3,145	\$82,000.00

Source: McFarland Johnson, Inc., analysis 2024.

**TAXIWAY REQUIREMENTS**

The analysis evaluated the airports’ existing taxiways. The standard considers that at a minimum the airports will allow the aircraft to clear the runway safety area at the end of the runway. This standard allows the LifeFlight Beechcraft to arrive while another operation can clear the runway safety area to allow LifeFlight to land. Where existing taxiway turnaround pavement exists at the end of the runway, no additional improvements are considered. Improvements are considered only where no existing ability to clear the runway safety area is available.

A partial taxiway turnaround at the end of the runway was selected as the minimum requirement based on the operational description above. The study recommends that select taxiways connecting the runway to the apron be 35 feet wide to accommodate the BE20 TDG 2A requirement.

The findings are presented in **Table 7**, which highlights the status of the taxiway pavements. The table provides information on the airports with respect to the minimum requirements, such as the taxiway type and width.

**Table 7: Taxiway Analysis – Results**

Airport Name	Existing Taxiway
Auburn-Lewiston Municipal Airport (LEW)	Full-length Parallel
Bangor International Airport (BGR)	Full-length Parallel
Brunswick Executive Airport (BXM)	Full-length Parallel
Greenville Municipal Airport (3B1)	Full-length Parallel
Hancock County-Bar Harbor Airport (BHB)	Full-length Parallel
Houlton International Airport (HUL)	Full-length Parallel
Knox County Regional Airport (RKD)	Full-length Parallel
Portland International Jetport (PWM)	Full-length Parallel
Presque Isle International Airport (PQI)	Full-length Parallel
Sanford Seacoast Regional Airport (SFM)	Full-length Parallel
Waterville Airport (WVL)	Full-length Parallel

Airport Name	Existing Taxiway
Wiscasset Municipal Airport (IWI)	Full-length Parallel
Augusta State Airport (AUG)	Partial parallel taxiway
Eastern Slope Regional Airport (IZG)	Partial parallel and partial taxiway turnaround
Millinocket Municipal Airport (MLT)	Stub connector and jug handle
Stephen A. Bean Municipal Airport (8B0)	Stub connector(s)
Bethel Regional Airport (0B1)	Full taxiway turnaround, partial taxiway turnaround
Belfast Municipal Airport (BST)	Partial parallel taxiway, full taxiway turnaround on one end
Caribou Municipal Airport (CAR)	Stub connector, partial taxiway turnaround
Central Maine Regional Airport (OWK)	Stub connector on one end
Dewitt Field Old Town Municipal Airport (OLD)	Full taxiway turnaround, partial taxiway turnaround
Dexter Regional Airport (1B0)	Stub connector on one end
Eastport Municipal Airport (EPM)	Stub connector on one end
Islesboro Airport (57B)	Full taxiway turnaround
Lincoln Regional Airport (LRG)	Stub connector one end
Machias Valley Airport (MVM)	Jug handle one end
Newton Field Airport (59B)	Stub connector on one end
Northern Aroostook Regional Airport (FVE)	Stub connector on one end, full taxiway turnaround
Oxford County Regional Airport (81B)	Stub connectors on two ends, partial taxiway turnaround
Princeton Municipal Airport (PNN)	Full taxiway turnaround, stub connector
Pittsfield Airport (2B7)	Stub connector one end
Stephen A. Bean Municipal Airport (8B0)	Stub connector(s)
Stonington Municipal Airport (93B)	Jug handle one end
Sugarloaf Regional Airport (B21)	Stub connectors
Biddeford Municipal Airport (B19)	No end connectors
Charles A. Chase Jr. Memorial Airport (44B)*	Grass field/strip (No existing pavement)

Source: McFarland Johnson, Inc., analysis 2024.

\*Grass field does not have a paved runway or paved taxiways.

The taxiway analysis indicates that several airports do not meet the minimum requirements for BE20 operations. Detailed findings are presented in **Table 8** below.

**Table 8: Taxiway Analysis – Shortfall to Minimum Requirements and Costs**

Airport Name	Taxiway Shortfalls	Taxiway Costs to Meet Minimum Turn-Around	Taxiway Costs to Meet 35' Width from Runway to Apron
Biddeford Municipal Airport (B19)	Partial Taxiway Turnaround (Two Runway Ends)	\$1,469,000.00	\$1,538,000.00
Charles A. Chase Jr. Memorial Airport (44B)*	Partial Taxiway Turnarounds (Two Runway Ends)	\$1,469,000.00	\$1,538,000.00
Augusta State Airport (AUG)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Caribou Municipal Airport (CAR)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Central Maine Regional Airport (OWK)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Dexter Regional Airport (1B0)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Greenville Municipal Airport (3B1)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Islesboro Airport (57B)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Lincoln Regional Airport (LRG)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Machias Valley Airport (MVM)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Newton Field Airport (59B)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Pittsfield Airport (2B7)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Princeton Municipal Airport (PNN)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Stephen A. Bean Municipal Airport (8B0)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Stonington Municipal Airport (93B)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00
Sugarloaf Regional Airport (B21)	Partial Taxiway Turnaround	\$919,000.00	\$1,139,000.00

Source: McFarland Johnson, Inc., analysis 2024.

\*Grass field does not have a paved runway or paved taxiways.

**INSTRUMENT APPROACH REQUIREMENTS**

An instrument approach procedure is a series of predetermined maneuvers for the orderly arrival of an aircraft operating under instrument flight rules from the beginning of the initial approach to a landing or to a point from which a landing may be made safely. The analysis assessed the instrument approach facilities for their ability to meet the minimum operational requirements of providing the Global Positioning System (GPS) guided Lateral Navigation (LNAV) approach. The results are displayed in **Table 9**, which indicates the status of the instrument approach equipment at the airports.

**Table 9: Instrument Approach Analysis – Results**

Airport Name	Approaches
Auburn-Lewiston Municipal Airport (LEW)	ILS/LOC 4, RNAV 4, RNAV 22
Augusta State Airport (AUG)	ILS/LOC 17, RNAV 17, RNAV 35, VOR 35
Bangor International Airport (BGR)	HI-ILS/LOC Z, ILS/LOC 33, ILS/LOC Y 15, RNAV 15, RNAV 33, H-VOR 15, Hi-VOR 33
Brunswick Executive Airport (BXM)	ILS/LOC 01R, RNAV 01R, RNAV 19L
Hancock County-Bar Harbor Airport (BHB)	ILS/LOC 22, RNAV 4, RNAV 22
Knox County Regional Airport (RKD)	ILS/LOC 13, RNAV 03, RNAV 13, RNAV 31
Portland International Jetport (PWM)	ILS/LOC 11, ILS/LOC 29, ILS (SA CAT I, II, III) 11, ILS (SA CAT I – II) 29 RNAV 11, RNAV 18, RNAV 29, RNAV 36, Harbor Visual 29
Presque Isle International Airport (PQI)	ILS/LOC 01, RNAV 01, RNAV 19, RNAV 28, VOR 19
Sanford Seacoast Regional Airport (SFM)	ILS/LOC 07, RNAV 07, RNAV 25, RNAV 32, VOR 25
Waterville Airport (WVL)	ILS/LOC 05, RNAV 05, RNAV 23
Belfast Municipal Airport (BST)	RNAV 15, RNAV 33
Bethel Regional Airport (0B1)	RNAV 32
Biddeford Municipal Airport (B19)	RNAV 06, VOR 06
Caribou Municipal Airport (CAR)	RNAV 01, RNAV 19
Central Maine Regional Airport (OWK)	RNAV 03, RNAV 15
Dewitt Field Old Town Municipal Airport (OLD)	RNAV 12, RNAV 22, RNAV 30, VOR 22
Dexter Regional Airport (1B0)	RNAV 16, RNAV 34
Eastern Slope Regional Airport (IZG)	RNAV 32
Eastport Municipal Airport (EPM)	RNAV 15, RNAV 33
Greenville Municipal Airport (3B1)	RNAV 14 RNAV 32
Houlton International Airport (HUL)	RNAV 5, RNAV A
Lincoln Regional Airport (LRG)	RNAV 16, RNAV 34
Machias Valley Airport (MVM)	RNAV 36
Millinocket Municipal Airport (MLT)	RNAV 11, RNAV 29, VOR 29

Airport Name	Approaches
Newton Field Airport (59B)	<b>RNAV 13 RNAV 31</b>
Northern Aroostook Regional Airport (FVE)	<b>RNAV 14, RNAV 32</b>
Oxford County Regional Airport (81B)	<b>RNAV 15, RNAV 33</b>
Pittsfield Airport (2B7)	<b>RNAV 18, RNAV 36</b>
Princeton Municipal Airport (PNN)	<b>RNAV 15 RNAV 33</b>
Stephen A. Bean Municipal Airport (8B0)	<b>RNAV 14 RNAV 32 RNAV D</b>
Sugarloaf Regional Airport (B21)	<b>RNAV A</b>
Wiscasset Municipal Airport (IWI)	<b>RNAV 07, RNAV 25</b>
Charles A. Chase Jr. Memorial Airport (44B)	<b>N/A</b>
Islesboro Airport (57B)	<b>N/A</b>
Stonington Municipal Airport (93B)	<b>N/A</b>

Source: McFarland Johnson, Inc., 2024.

The instrument approach analysis indicates that three (3) airports lack the LNAV minimum requirement. The LNAV utilizes GPS for navigation, therefore, there are no facilities to be installed at the airport. The cost estimates below consider the aeronautical surveys to be submitted to the National Geodetic Survey prescribed in FAA AC 150/5300-18B *General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards*. The FAA requires these surveys to design the LNAV approaches. Details are presented in **Table 10**.

**Table 10: Instrument Approach Analysis – Shortfall to Minimum Requirements and Cost**

Airport Name	Instrument Approach Shortfalls	Instrument Approach Costs to Meet Minimum
Charles A. Chase Jr. Memorial Airport (44B)	<b>LNAV</b>	\$250,000.00
Islesboro Airport (57B)	<b>LNAV</b>	\$250,000.00
Stonington Municipal Airport (93B)	<b>LNAV</b>	\$250,000.00

Source: McFarland Johnson, Inc., analysis 2024.

**APPROACH LIGHTING REQUIREMENTS**

The analysis evaluated the adequacy of runway approach lighting at public airports in the state for medical aviation operators. The findings are presented in **Table 11** which summarizes the status of the lighting equipment. The study analyzed the lighting's ability to meet the minimum operational requirements necessary for safe landing approaches. The results will likely inform future decisions on improvements to the lighting facilities and will be crucial for enhancing the safety of aeromedical operations.



**Table 11: Airport Approach Lighting Analysis – Results**

Airport Name	Approach Lighting
Bangor International Airport (BGR)	MALSR, ALSF2, HIRL
Portland International Jetport (PWM)	ALSF2, MALSR, HIRL
Auburn-Lewiston Municipal Airport (LEW)	MALSR, HIRL, REILS
Augusta State Airport (AUG)	MALSR, HIRL, REILS
Brunswick Executive Airport (BXM)	MALSR, HIRL, REILS
Hancock County-Bar Harbor Airport (BHB)	MALSF, HIRL, REILS
Knox County Regional Airport (RKD)	MALSR, HIRL, REILS
Presque Isle International Airport (PQI)	MALSR, HIRL, REILS
Waterville Airport (WVL)	MALSF, HIRL
Belfast Municipal Airport (BST)	REILS, MIRL
Bethel Regional Airport (OB1)	REILS, MIRL
Biddeford Municipal Airport (B19)	REILS, MIRL
Central Maine Regional Airport (OWK)	REILS, MIRL
Dewitt Field Old Town Municipal Airport (OLD)	REILS, MIRL
Eastern Slope Regional Airport (IZG)	REILS, MIRL
Eastport Municipal Airport (EPM)	REILS, MIRL
Grenville Municipal Airport (3B1)	REILS, MIRL
Houlton International Airport (HUL)	REILS, MIRL
Lincoln Regional Airport (LRG)	REILS, MIRL
Machias Valley Airport (MVM)	REILS, MIRL
Millinocket Municipal Airport (MLT)	REILS, MIRL
Newton Field Airport (59B)	REILS, MIRL
Northern Aroostook Regional Airport (FVE)	REILS, MIRL
Pittsfield Airport (2B7)	REILS, MIRL
Sanford Seacoast Regional Airport (SFM)	ODALS, REILS, HIRL
Stephen A. Bean Municipal Airport (8B0)	REILS, MIRL
Wiscasset Municipal Airport (IWI)	REILS, MIRL
Caribou Municipal Airport (CAR)	MIRL
Dexter Regional Airport (1B0)	MIRL
Oxford County Regional Airport (81B)	MIRL
Princeton Municipal Airport (PNN)	MIRL
Charles A. Chase Jr. Memorial Airport (44B)	N/A
Islesboro Municipal Airport (57B)	N/A
Sugarloaf Regional Airport (B21)	N/A
Stonington Municipal Airport (93B)	N/A

Source: McFarland Johnson, Inc., analysis 2024.

Eight (8) airports lack lighting that would enhance the safety of aircraft operations. Addressing these deficiencies by implementing appropriate and adequate approach lighting systems would help to ensure uninterrupted medical services to the surrounding communities. The following is a breakdown of the shortfalls and costs associated with providing approach lighting facilities to meet the minimum requirements. **Table 12** provides airport approach lighting shortfalls and the necessary costs to meet the minimum requirements.

**Table 12: Airport Approach Lighting Analysis – Shortfalls to Minimum Standards and Cost**

Airport Name	Approach Lighting Shortfalls	Approach Lighting Costs to Meet Minimum
Caribou Municipal Airport (CAR)	REILS	\$105,000.00
Dexter Regional Airport (1B0)	REILS	\$105,000.00
Oxford County Regional Airport (81B)	REILS	\$105,000.00
Princeton Municipal Airport (PNN)	REILS	\$105,000.00
Charles A. Chase Jr. Memorial Airport (44B)	REILS & MIRL	\$230,000.00
Islesboro Municipal Airport (57B)	REILS & MIRL	\$230,000.00
Stonington Municipal Airport (93B)	REILS & MIRL	\$230,000.00
Sugarloaf Regional Airport (B21)	REILS & MIRL	\$230,000.00

Source: McFarland Johnson, Inc., analysis 2024.

### VERTICAL GUIDANCE INDICATOR REQUIREMENTS

The analysis focused on the state's public airports and their Visual Glide Slope Indicator (VGSI) capabilities for aeromedical operators. There are two (2) types of VGSI capabilities, a Visual Approach Slope Indicator (VASI) and a Precision Approach path Indicator (PAPI) lighting. A VASI is a system of lights to provide visual descent guidance information during the approach to a runway. VASI lighting is visible 3-5 miles during the day, and up to 20 miles or more at night. VASI lighting can be organized in bars, the most common are two-box or two-bar. PAPI lights use similar units to the VASI but are installed in a single row of either two (2) or four (4) light units. PAPI lighting uses a narrower beam of light which offers a higher level of precision for pilots. The results are presented in **Table 13**, outlining the status of VGSI at each airport. The table lists the VGSI's operational capabilities and highlights any deficiencies, to identify areas that require improvement. Overall, the analysis provides a comprehensive assessment of the state's aviation infrastructure and its ability to support aeromedical operations.

**Table 13: Vertical Guidance Indicator Analysis – Results**

Airport Name	VGSI
Auburn-Lewiston Municipal Airport (LEW)	4-Box PAPI (2)
Augusta State Airport (AUG)	4-Box PAPI(2)
Bangor International Airport (BGR)	4-Box PAPI(2)
Biddeford Municipal Airport (B19)	4-Box PAPI
Brunswick Executive Airport (BXM)	4-Box PAPI(2)

Airport Name	VGSI
Central Maine Regional Airport (OWK)	2-Box PAPI
Dewitt Field Old Town Municipal Airport (OLD)	4-Box PAPI
Eastern Slope Regional Airport (IZG)	2-Box VASI
Eastport Municipal Airport (EPM)	2-Box PAPI
Greenville Municipal Airport (3B1)	4-Box PAPI(2)
Hancock County-Bar Harbor Airport (BHB)	4-Box VASI(2)
Houlton International Airport (HUL)	4-Box PAPI
Knox County Regional Airport (RKD)	4-Box PAPI(2)
Millinocket Municipal Airport (MLT)	4-Box VASI
Northern Aroostook Regional Airport (FVE)	4-Box PAPI
Pittsfield Airport (2B7)	4-Box PAPI
Portland International Jetport (PWM)	4-Box PAPI(2)
Presque Isle International Airport (PQI)	4-Box PAPI
Princeton Municipal Airport (PNN)	4-Box PAPI
Sanford Seacoast Regional Airport (SFM)	4-Box PAPI(2)
Stephen A. Bean Municipal (8B0)	4-Box PAPI(2)
Waterville Airport (WVL)	4-Box PAPI, 4-Box VASI
Wiscasset Municipal Airport (IWI)	4-Box PAPI(2)
Belfast Municipal Airport (BST)	N/A
Bethel Regional Airport (0B1)	N/A
Caribou Municipal Airport (CAR)	N/A
Charles A. Chase Jr. Memorial Airport (44B)	N/A
Dexter Regional Airport (1B0)	N/A
Islesboro Airport (57B)	N/A
Lincoln Regional Airport (LRG)	N/A
Machias Valley Airport (MVM)	N/A
Newton Field Airport (59B)	N/A
Oxford County Regional Airport (81B)	N/A
Stonington Municipal Airport (93B)	N/A
Sugarloaf Regional Airport (B21)	N/A

Source: McFarland Johnson, Inc., analysis 2024.

The analysis revealed that twelve airports lack VGSI that could enhance the safety of aircraft approaches. Detailed information regarding the VGSI deficits of these airports and the necessary costs to meet the minimum requirements is provided in **Table 14** below.

**Table 14: Vertical Guidance Indicators Analysis – Shortfalls to Minimum Standards and Cost**

Airport Name	VGSI Shortfalls	VGSI Costs to Meet Minimum
Belfast Municipal Airport (BST)	<b>2-Box PAPI</b>	\$150,000
Bethel Regional Airport (0B1)	<b>2-Box PAPI</b>	\$150,000
Caribou Municipal Airport (CAR)	<b>2-Box PAPI</b>	\$150,000
Charles A. Chase Jr. Memorial Airport (44B)	<b>2-Box PAPI</b>	\$150,000
Dexter Regional Airport (1B0)	<b>2-Box PAPI</b>	\$150,000
Islesboro Airport (57B)	<b>2-Box PAPI</b>	\$150,000
Lincoln Regional Airport (LRG)	<b>2-Box PAPI</b>	\$150,000
Machias Valley Airport (MVM)	<b>2-Box PAPI</b>	\$150,000
Newton Field Airport (59B)	<b>2-Box PAPI</b>	\$150,000
Oxford County Regional Airport (81B)	<b>2-Box PAPI</b>	\$150,000
Stonington Municipal Airport (93B)	<b>2-Box PAPI</b>	\$150,000
Sugarloaf Regional Airport (B21)	<b>2-Box PAPI</b>	\$150,000

Source: McFarland Johnson, Inc., analysis 2024.

**WEATHER REPORTING SYSTEM REQUIREMENTS**

Weather reporting systems consist of processors, computer-generated voice subsystems, and a transmitter to provide local minute-by-minute weather directly to the pilot. There are multiple types of weather reporting systems:

- AWOS-A: Reports altimeter setting
- AWOS-AV: Reports altimeter and visibility
- AWOS-I Reports altimeter setting, wind data, temperature, dew point, and density altitude
- AWOS-II: Provides information the same as AWOS-1 plus visibility
- AWOS-III: Provides information the same as AWOS-2 plus cloud/ceiling data
- AWOS-IIIP: Provides reports the same as AWOS 3, plus a precipitation sensor
- AWOS-IIIPT: Provides information the same as AWOS-3P plus thunderstorm/lighting reporting capability.
- AWOS-IIIT: Reports the same as AWOS-III and includes thunderstorm/lighting reporting capabilities.
- AWOS-IV: Reports the same as the AWOS-III system, plus precipitation occurrence, type and accumulation, freezing rain, thunderstorm, and runway surface sensors.
- ASOS (Automated Surface Observing System): The primary surface weather observing system in the US and provides multiple weather sensors.

The weather reporting system capabilities for aeromedical operators at public airports in the State was analyzed. The results are presented in a table format, outlining the status of weather reporting systems at each airport and any identified deficiencies. The goal is to identify areas for improvement and to enhance the safety of aircraft operations, particularly those conducted by aeromedical providers.

**Table 15: Weather Reporting System Requirement Analysis – Results**

Airport Name	Weather Reporting
Augusta State Airport (AUG)	ASOS
Bangor International Airport (BGR)	ASOS
Caribou Municipal Airport (CAR)	ASOS
Eastern Slope Regional Airport (IZG)	ASOS
Houlton International Airport (HUL)	ASOS
Millinocket Municipal Airport (MLT)	ASOS
Northern Aroostook Regional Airport (FVE)	ASOS
Portland International Jetport (PWM)	ASOS
Wiscasset Municipal Airport (IWI)	ASOS
Auburn-Lewiston Municipal Airport (LEW)	AWOS-IIPT
Hancock County-Bar Harbor Airport (BHB)	AWOS-IIPT
Knox County Regional Airport (RKD)	AWOS-IIPT
Presque Isle International Airport (PQI)	AWOS-IIPT
Sanford Seacoast Regional Airport (SFM)	AWOS-IIPT
Stephen A. Bean Municipal (8B0)	AWOS-IIPT
Waterville Airport (WVL)	AWOS-IIPT
Newton Field Airport (59B)	AWOS-III
Greenville Municipal Airport (3B1)	AWOS-A
Belfast Municipal Airport (BST)	AWOS-AV
Bethel Regional Airport (0B1)	AWOS-AV
Brunswick Executive Airport (BXM)	AWOS-AV
Central Maine Regional Airport (OWK)	AWOS-AV
Eastport Municipal Airport (EPM)	AWOS-AV
Machias Valley Airport (MVM)	AWOS-AV
Princeton Municipal Airport (PNN)	AWOS-AV
Sugarloaf Regional Airport (B21)	AWOS-AV
Biddeford Municipal Airport (B19)	N/A
Charles A. Chase Jr. Memorial Airport (44B)	N/A
Dewitt Field Old Town Municipal Airport (OLD)	N/A
Dexter Regional Airport (1B0)	N/A
Islesboro Airport (57b)	N/A
Lincoln Regional Airport (LRG)	N/A
Oxford County Regional Airport (81B)	N/A
Pittsfield Airport (2B7)	N/A
Stonington Municipal Airport (93B)	N/A

Source: McFarland Johnson, Inc., analysis 2024.

Nine (9) airports have weather reporting systems that do not meet minimum requirements for aeromedical operators like LifeFlight. In addition to the nine (9) airports identified, LifeFlight has also identified one (1) additional airport that has existing weather reporting systems that are recommended for upgrades. A total of ten (10) airports have been recommended for upgrades to improved or more advanced systems such as an AWOS-III. MaineDOT has advanced the Phase 1 recommendation to analyze and implement AWOS throughout the System. A detailed engineered estimate was established through that effort. MaineDOT is currently in phased process of equipping the following airports with an upgraded AWOS-III system to increase the safety and efficiency of aeromedical flights:

- Belfast Municipal Airport (BST)
- Bethel Regional Airport (OB1)
- Brunswick Executive Airport (BXM)\*
- Central Maine Regional Airport (OWK)
- Eastport Municipal Airport (EPM)
- Greenville Municipal Airport (3B1)
- Machias Valley Airport (MVM)
- Newton Field Airport (59B)
- Princeton Municipal Airport (PNN)
- Sugarloaf Regional Airport (B21)

\* The AWOS – III upgrade has been completed by BXM.

**SNOW REMOVAL EQUIPMENT REQUIREMENTS**

The analysis evaluated the snow removal equipment (SRE) capabilities at Maine public-use airports with the objective of identifying areas for improvement to ensure safe and efficient medical aviation operations during winter conditions. All of the airports analyzed during this study own some form of SRE equipment. **Table 17** highlights deficiencies in SRE availability at two (2) airports as noted by LifeFlight of Maine.

**Table 17: Snow Removal Equipment Analysis – Shortfalls**

Airport Name	SRE Equipment	SRE Costs to Meet Minimum Requirements
Caribou Municipal Airport (CAR)	SRE	\$750,000.00
Northern Aroostook Regional Airport (FVE)	SRE	\$750,000.00

Source: McFarland Johnson, Inc., analysis 2024.

While the analysis and reports from LifeFlight indicated that all airports throughout the state of Maine have SRE, it was identified that two (2) airports could use improved maintenance and SRE equipment. LifeFlight noted that FVE requires a broom and improved SRE, while CAR would benefit from improved maintenance of the airport surfaces during winter months to ensure consistent aircraft operations.

# Appendix C: SPR Model Technical Report

SPR Model Technical Report

C-1 – C-33



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## MEMORANDUM

**TO:** Maine Department of Transportation  
**FROM:** McFarland Johnson, Inc.  
**DATE:** December 2023  
**SUBJECT:** State Priority Ranking Model Technical Report  
**PROJECT NO.:** MJ#19008.00

The State of Maine, through its Department of Transportation (MaineDOT), has tasked McFarland Johnson, Inc. (MJ) with providing aviation planning services for the development of a State Priority Ranking Model (SPR model). The objective of this technical memorandum is to outline the methodology and criteria for the development of the SPR Model and provide guidance on its use.

### 1. Introduction

A State Priority Ranking Model was developed to rank and prioritize projects to address MaineDOT facilities and services challenges, maintenance issues, and overall State Aviation System Plan (SASP) needs in a fiscally constrained environment. The development of the SPR model was a major system recommendation from Phase I that was advanced to Phase II of the SASP.

The SPR model is a flexible and dynamic modeling tool that allows MaineDOT to explore and analyze the ranking of Capital Improvement Projects (CIP) requests from the 35 airports within the System.

The SPR model was developed based on the following criteria:

- Existing Pavement Condition Index (PCI) rating, project cost, and national priority ranking scores
- Airport activity levels based on new General Audio Recording Device (GARD) data
- Function or services being supported
- Improvement to the financial sustainability of the airport
- Special condition/use nuances
- MaineDOT General Aviation Airport Annual Inspection Report Card
- Airport economic impacts
- Eligible funding sources and percentages



## 1.1 MaineDOT Long-Range Transportation Plan and MaineDOT SASP Goals

The Long-Range Transportation Plan (LRTP) is a comprehensive vision for the State's transportation system, outlining a strategic framework for implementation strategies for MaineDOT and its partners. The LRTP is the overarching document for the MaineDOT's Family of Plans and includes the Statewide Active Transportation Plan, the Statewide Strategic Transit Plan, the Statewide Aviation System Plan, and the Maine State Rail Plan. The goals of the LRTP (listed below) are reflected in the development of the SPR model and were incorporated into the model's criteria and design:

- **Safe Travel:** Provide a safe transportation system for all users and modes of transportation
- **A Well Managed System:** Effectively manage Maine's existing transportation system within reliable funding levels to provide levels of service that are acceptable to our customers.
- **A Vibrant Economy and World-Class Quality of Life:** Invest in transportation initiatives that support economic opportunity for Maine people, communities, and businesses.
- **Environmentally Sustainable Transportation System:** Invest in practical transportation solutions that mitigate impacts on the natural world and prepare for the realities of change.
- **Equitable Access:** Ensure that all Maine people have access to safe and reliable transportation regardless of who they are or where they are.

The six (6) goals (listed below), identified in the Maine SASP Phase I, are central in shaping the design and the development of the SPR model:

- Understand current and future potential aviation system contributions to meeting expressed societal needs.
- Identify trends, gaps, opportunities, and prioritized recommendations for nurturing key system components, including aviation workforce development.
- Use realistic, fiscally constrained life-cycle analyses to foster the development of right-sized facilities affordable for sponsors and investment partners.
- Recommend strategies to leverage public investments to generate private investments and public policies that support a safe and efficient airport system.
- Develop meaningful and practical metrics to track the condition, utilization, and performance of the airport system
- Identify and justify necessary and desirable system management functions, including who should perform them and how they should be financed.

## 1.2 SPR Model Definitions and Acronyms

For the purpose of the SPR model and its utilization, below are definitions and acronyms that are incorporated throughout the technical memo as reference:

### 1.2.1 Definitions

- **Workbook:** Includes all the worksheets contained within the excel file.
- **Worksheet:** A single page within the workbook that is separated from the other pages through tabs that are labeled.
- **Cell:** A unit within the worksheet where data is entered or stored
- **User input(s):** Text, drop-down choice, or numerical data or information the user is required to fill out in the cell within each worksheet.
- **Percentile Rank:** A statistical method to determine how a value compares to other values in a data set by determining a value on a scale of 100.

### 1.2.2 Acronyms

- **SPR** – State Priority Ranking Model
- **NPIAS:** National Plan of Integrated Airport Systems identifies nearly 3,300 public-use airports and their roles that are eligible for Federal funding.<sup>1</sup>
- **ROI** – Return on Investment. A measurement of the profit or loss on an investment (i.e., CIP project) relative to its initial cost
- **CIP** – Capital Improvement Plan (CIP) enhances the capacity, safety, and efficiency of an airport through designated airport projects. The CIP serves as the primary planning tool for systematically identifying, prioritizing, and assigning funds to critical airport development and associated capital needs for the National Airspace System (NAS)<sup>2</sup>
- **SASP** – State Aviation System Plan
- **GARD** – General Audio Recording Device
- **PCI** – Pavement Condition Index
- **PMP** – Pavement Management Program
- **M&R** – Preventative Maintenance and Rehabilitation, utilized in the discussion of PCI
- **NPIAS** – National Plan of Integrated Airport Systems
- **TFMSC** – Traffic Flow Management System Counts
- **FAA** – Federal Aviation Administration

## 1.3 Overview of the SPR Dashboard and SPR Model Design

The SPR model Dashboard is the summary of all the outputs from the SPR model worksheets where the final ranking calculations are performed and displayed. There are 25 columns on the dashboard. The SPR Dashboard consists of five (5) sections:

<sup>1</sup> FAA. National Plan of Integrated Airport Systems (NPIAS). Accessed November 22, 2023. [https://www.faa.gov/airports/planning\\_capacity/npias](https://www.faa.gov/airports/planning_capacity/npias)

<sup>2</sup> FAA.gov. Order-5100-39A-ACIP. August 22, 2000. Accessed November 22, 2023. [FAA Order 5100.39A, Airports Capital Improvement Plan, 22 August 2000](#)

- CIP Project Information
- Airport Specific Scoring Criteria
- Project Specific Scoring Criteria
- Total Project and Airport Score
- Overall Ranking and Ranking by Asset Role

### 1.3.1 CIP Project Information

The CIP project information section on the SPR dashboard serves as the input worksheet where general information is entered to identify specific CIP projects by airport. This data is then referenced and utilized across multiple worksheets through the model's operation. **Table 1** is a sample of the outlay of projects and their values in the SPR dashboard. This is for general purposes only as it is an illustration of the model set-up, the data displayed should not be regarded as exact.

**Table 1: CIP Project Information – Sample**

A	B	C	D	E	F	G	H
#	Airport Name	Airport Code	Asset Role	Project Description	CIP Year	Total Project Cost	State Share Total
1	Bangor Intl.	BGR	Commercial Service - Primary	Apron Lighting Study and Recommendation	2026	\$75,000	\$1,875
2	Portland Intl. Jetport	PWM	Commercial Service - Primary	Reconstruct Taxiways A, D, E, & F (S36)	2024	\$13,300,000	\$665,000
3	Augusta State	AUG	Commercial Service - Non-Primary	Design/Permit GA Apron	2025	\$275,000	\$27,500
4	Hancock County/ Bar Harbor	BHB	Commercial Service - Non-Primary	2026-Purchase SRE Equip. (Sweeper and carrier vehicle)	2026	\$900,000	\$45,000
5	Auburn/ Lewiston Municipal	LEW	General Aviation - Regional	Reconstruct Terminal Apron & Portion Tie-Down Apron Ph 1	2024	\$760,000	\$38,000
6	Sanford Seacoast Regional	SFM	General Aviation - Regional	Second Runway Property Acquisition	2024	\$1,050,000	\$52,500
7	Houlton Intl.	HUL	General Aviation - Local	Replace Jet A and Avgas Fuel Farms	2023	\$1,315,063	\$62,500
8	Lincoln Regional	LRG	General Aviation - Local	AMPU	2025	\$333,000	\$16,650
9	Caribou Municipal	CAR	General Aviation - Basic	Replace Jet A and Avgas Fuel Farms	2023	\$1,315,063	\$62,500
10	Machias Valley	MVM	General Aviation - Basic	AMPU	2025	\$333,000	\$16,650

Source: McFarland Johnson, Inc, 2023.

### 1.3.1.1 CIP Project Information User Input

Below is the required user inputs outlined in **Table 1** for the CIP Project Information section

- **Airport Name** – (Column B) – The user will either pull down the airport name or paste it into the cell. The user needs to input the airport’s proper name in accordance with its FAA NPIAS name designation.
- **Project Description** – (Column E) – The user will input the project description as described in the official MaineDOT CIP Plan and/or other grant project description.
- **CIP Year** – (Column F) – The user will input the CIP Year for the project consideration
- **Total Project Costs** – (Column G) – The user will input the estimated total project cost
- **State Share Total** – (Column H) – The user will input the estimated state share cost for the project. If there is no state share for the project, the user must input \$0.00 in the cell.

### 1.3.1.2 CIP Project Information Automatically Populated Columns

The workbook is set up so the results of each worksheet are directly referenced in the SPR dashboard. Below is a listing of the CIP Project Information section that are automatically populated by the user inputs:

- **Input Number** – (Column A) – A sequential number that is attached to each project input into the SPR dashboard. The input number links to other worksheets within the model to help the user keep track of the specific projects listed on the SPR dashboard worksheet.
- **Airport Code** – (Column C) - Also known as the local ID or the IATA-designated airport code. This is the 3-letter unique airport location identifier for each airport. The data is automatically populated based on the user input in Column B (Airport Name)
- **Asset Role Designation** – (Column D) – A combination of an airport’s category and role that is designated by FAA NPIAS. There are four (4) categories of levels also known as service levels that the airport provides to the community as designated by the NPIAS (Commercial Service – Primary, Commercial Service – Non-Primary, Reliever Airport, and General Aviation Airport). There are five (5) categories of roles serving general aviation operations based on current activity measures as designated by the NPIAS (National, Regional, Local, Basic, and Unclassified).<sup>3</sup> The data is automatically populated based on the user input in Column B (Airport Name)
- For the SPR model there are (6) asset roles applicable to the 35 airports within the State of Maine System of Airports listed below:
  - **Commercial Service** – Primary (BGR, PQI, PWM, RKD)
  - **Commercial Service** – Non-Primary (AUG, BHB)
  - **General Aviation** – Regional (LEW, SFM)
  - **General Aviation** – Local (OB1, 1B0, 2B7, 81B, B19, BST, BXM, HUL, IWI, IZG, LRG, MLT, OLD, OWK, WVL)

<sup>3</sup> FAA. Appendix A: List of NPIAS Airports – Explanation of terms and abbreviations used in Appendix A. Accessed November 22, 2023. <https://www.faa.gov/sites/faa.gov/files/2022-10/ARP-NPIAS-2023-Appendix-A.pdf>

- **General Aviation** – Basic (3B1, 59B, 8B0, B21, CAR, EPM, FVE, MVM, PNN)
- **General Aviation** – Unclassified (44B, 57B, 93B)

## 1.4 Overall Ranking

The overall ranking is calculated from the summation of the total airport score and the total project score. The total number of projects within a fiscal year directly affects the overall rank (i.e., if there are 54 projects each project would get a rank from 1 to 54). In this example, the highest score would be ranked 1 and the lowest score would be ranked 54. In the overall ranking system, the calculated output is influenced by each one of the components (total airport and total project). For example, if the total airport score is high but the total project score is low that will reflect in the overall rank. Some projects might not compete well in certain fiscal years but would rank higher in others.

## 1.5 Ranking by Asset Role

A separate ranking system in consideration of the FAA asset role category (column X) allows for a “like vs. like” where the airport’s CIP projects are within the same asset role category are ranked against one another. The FAA asset designations are based on the magnitude of activity levels and the service the airport provides for the community. For example, a commercial service airport, being the type of airport with its dramatically larger number of operations and higher CIP funding needs, would have a higher probability of outranking the general aviation – local airports. Ranking projects by asset role versus the entire MaineDOT State Aviation System alleviates a bias of larger-sized airports over smaller airports allowing for balanced support to communities across Maine. This allows MaineDOT to manage minimum investment amounts for each asset role.

## 1.6 Special Conditions Use and Nuances

There are circumstances where projects can be classified as special conditions use and nuances which override the initial scores calculated and are given the highest score in the overall project ranking and the ranking by asset category. MaineDOT has the discretion to determine whether a project qualifies for this category. These special use and nuance projects address acute needs such as emergency measures required for safety, new and emerging technologies projects and foster other projects critical in achieving MaineDOT goals, positioning Maine as a leader in transportation and seizing opportunities with broad community support.<sup>4</sup>

**Table 2** illustrates a sample of special conditions use and nuances and their values on the SPR dashboard. This is for general purposes only as it is an illustration of the model set-up, the data displayed should not be regarded as exact.

<sup>4</sup> Maine Department of Transportation. MaineDOT Family of Plans. 2022. Accessed November 21, 2023. <https://storymaps.arcgis.com/stories/318efcdfbd774fb8baba7551462e1fae>

**Table 2: Special Conditions Use and Nuances Sample**

S	T
<b>Special Conditions Use Nuances (override to total 5000)</b>	<b>If Yes Special Conditions, Explanation</b>
Yes	Emerging Technology Initiative – electric aircraft charging and support climate change
No	
Yes	Must fund FY 2024 to capture funding
No	
No	
No	
Yes	Maine Forrest Service and Maine State Police collaborative need of MaineDOT
No	

Source: McFarland Johnson, Inc, 2023.

### 1.6.1 Special Conditions Use and Nuances - User Input into the SPR Dashboard

In (Column S), the user will use the drop-down menu to select “yes” or “no.” If the project is considered a special condition use and nuance project, the total project and airport score will receive 5,000 extra points, thus superseding all the scores on the worksheet. In (Column T) MaineDOT can justify the project’s special condition use and nuance designation for transparency and defensible documentation.

## 2. Airport Specific Scoring Criteria

The total airport score assesses the value of the individual airport and how it serves the community in its unique role within the System. Four (4) components are calculated together to determine the overall airport-specific score: (1) Airport GARD Operations, (2) Airport Overall Function Value, (3) Airport Overall Economic Output, and (4) Airport Sponsor Performance Metrics. **Table 3** illustrates a sample of the airport specific scoring criteria as it would appear on the SPR dashboard.

**Table 3 : Airport Specific Scoring Criteria (SPR Dashboard) – Sample**

Airport Specific Scoring Elements			
I	J	K	L
Airport G.A.R.D. Operations	Airport Overall Function Value	Airport Overall Economic Output	Airport Sponsor Performance Metrics
6.0	6.2	6.0	1.0
8.0	8.5	8.0	1.0
6.7	5.0	3.3	1.0
3.3	4.2	6.7	1.0

Airport G.A.R.D. Operations	Airport Overall Function Value	Airport Overall Economic Output	Airport Sponsor Performance Metrics
3.3	5.4	6.7	1.0
6.7	4.9	3.3	1.0
1.3	2.8	4.4	1.0
6.3	2.7	6.9	1.0
8.0	1.7	7.0	1.0
4.0	6.5	2.0	1.0

Source: McFarland Johnson, Inc, 2023.

## 2.1 Airport GARD Operations

The airport GARD operations metric for the SPR model calculates an airport's score based upon its adjusted number of operations. Airport operations represent the magnitude of the movement of goods and people to and from communities across Maine. Airports with higher activity levels gain a more favorable score due to their ability to enhance connectivity for the State and reach a wider population segment.

### 2.1.1 Airport GARD Operations – Background

MaineDOT and airport sponsors use GARD to actively monitor and record data to garner representative operational counts. When cross-referenced with TFMSC, an adjusted number of operations can be determined for each airport. This is updated periodically to capture changes within the System.

### 2.1.2 SPR Model Element – GARD Operations and Integration into SPR Dashboard

**Table 4** illustrates a sample of the GARD operation worksheet metric from the SPR model. This is for general purposes only as it is an illustration of the model set-up, the data displayed should not be regarded as exact. For the model, a percentile rank for each airport is calculated in (Column E) which then compares its value to all other airport values within the System. The percentile rank is then converted to a 10-point structure (Column F). The "SPR Dashboard" (Column I) is automatically filled in with the results to correspond to the airport for the CIP project listed.

For any updates on the operations, the user must input each airport's new data in the "GARD Operations" worksheet under the Adjusted GARD Operations Data (Column D).

**Table 4: GARD Operations Worksheet**

A	B	C	D	E	F
Airport Code	Airport Name	Asset Role Designation	Adjusted G.A.R.D Operations Data	Percentile Rank	Conversion to 10 - Points
BGR	Bangor International Airport	Commercial Service - Primary	44,682	94%	9.4
RKD	Knox County Regional Airport	Commercial Service - Primary	40,189	92%	9.2
PWM	Portland Jetport	Commercial Service - Primary	58,182	97%	9.7
PQI	Presque Isle International Airport	Commercial Service - Primary	14,643	75%	7.5
AUG	Augusta State Airport	Commercial Service - Non-Primary	23,008	81%	8.1
BHB	Hancock County-Bar Harbor Airport	Commercial Service - Non-Primary	22,181	78%	7.8
LEW	Auburn-Lewiston Municipal	General Aviation - Regional	23,008	83%	8.3
SFM	Sanford Seacoast Regional Airport	General Aviation - Regional	36,739	89%	8.9
BST	Belfast Municipal Airport	General Aviation - Local	2,899	33%	3.3
0B1	Bethel Regional Airport	General Aviation - Local	3,450	36%	3.6
B19	Biddeford Municipal Airport	General Aviation - Local	6,227	53%	5.3
BXM	Brunswick Executive	General Aviation - Local	24,259	86%	8.6
OWK	Central Maine Airport of Norridgewock	General Aviation - Local	9,915	69%	6.9
OLD	Dewitt Field - Old Town Municipal Airport	General Aviation - Local	7,290	56%	5.6
1B0	Dexter Regional Airport	General Aviation - Local	7,290	56%	5.6
IZG	Eastern Slope Regional Airport	General Aviation - Local	4,969	44%	4.4
HUL	Houlton International Airport	General Aviation - Local	1,950	25%	2.5
LRG	Lincoln Regional Airport	General Aviation - Local	7,290	56%	5.6
MLT	Millinocket Municipal Airport	General Aviation - Local	2,340	28%	2.8
81B	Oxford County Regional Airport	General Aviation - Local	1,867	22%	2.2
2B7	Pittsfield Municipal Airport	General Aviation - Local	5,120	47%	4.7
WVL	Waterville Robert Lafleur Airport	General Aviation - Local	10,730	72%	7.2
IWI	Wiscasset Airport	General Aviation - Local	4,300	42%	4.2
CAR	Caribou Municipal Airport	General Aviation - Basic	6,167	50%	5.0
EPM	Eastport Municipal Airport	General Aviation - Basic	2,760	31%	3.1
3B1	Greenville Municipal Airport	General Aviation - Basic	8,933	64%	6.4
MVM	Machias Valley Airport	General Aviation - Basic	1,660	17%	1.7
59B	Newton Field Airport	General Aviation - Basic	680	8%	0.8
FVE	Northern Aroostook Regional Airport	General Aviation - Basic	3,640	39%	3.9
PNN	Princeton Municipal Airport	General Aviation - Basic	1,760	19%	1.9
8B0	Steven A Bean Municipal Airport	General Aviation - Basic	1,000	11%	1.1
B21	Sugarloaf Regional Airport	General Aviation - Basic	560	6%	0.6
44B	Charles A Chase Memorial Airport	General Aviation - Unclassified	50	3%	0.3
57B	Islesboro Airport	General Aviation - Unclassified	9,850	67%	6.7
93B	Stonington Municipal Airport	General Aviation - Unclassified	1,200	14%	1.4

Source: McFarland Johnson, Inc, 2023.

## 2.2 Airport Overall Function Value

An airport’s overall function captures the core purpose the airport serves and the value it provides to its community, the State, and the System. This metric measures an airport’s overall emphasis on the performance of each of the five (5) FAA designated asset function categories.

### 2.2.1 Airport Overall Function Value - Background

The five (5) FAA designated asset function categories are listed below:

- Emergency Preparedness and Response
- Critical Community Access
- Other Aviation Specific Functions
- Commercial, Industrial, and Economic Activities
- Destination and Special Events



**Figure 1** outlines the types of services and activities that are incorporated in each of the FAA asset function categories. The airport's overall function metric is built upon these five (5) categories as it is the foundation in determining an airport's overall function and its benefits to the community and the aviation needs of the State.

**Figure 1: FAA Asset Function Categories**

<p><b>Emergency Preparedness and Response</b></p>	<ul style="list-style-type: none"> <li>▪ Aeromedical Flights</li> <li>▪ Law Enforcement/National Security/Border Security</li> <li>▪ Emergency Response</li> <li>▪ Aerial Fire Fighting Support</li> <li>▪ Emergency Diversionary Airport</li> <li>▪ Disaster Relief and Search and Rescue</li> <li>▪ Critical Federal Functions</li> </ul>	
<p><b>Critical Community Access</b></p>	<ul style="list-style-type: none"> <li>▪ Remote Population/Island Access</li> <li>▪ Air Taxi/Charter Services</li> <li>▪ Essential Scheduled Air Service Cargo</li> </ul>	
<p><b>Other Aviation Specific Functions</b></p>	<ul style="list-style-type: none"> <li>▪ Self-Piloted Business Flights</li> <li>▪ Corporate</li> <li>▪ Flight Instruction</li> <li>▪ Personal Flying</li> <li>▪ Charter Passenger Services</li> <li>▪ Aircraft/Avionics Manufacturing/Maintenance</li> <li>▪ Aircraft Storage</li> <li>▪ Aerospace Engineering/Research</li> </ul>	
<p><b>Commercial, Industrial, and Economic Activities</b></p>	<ul style="list-style-type: none"> <li>▪ Agricultural Support</li> <li>▪ Aerial Surveying and Observation</li> <li>▪ Low-Orbit Space Launch and Landing</li> <li>▪ Oil and Mineral Exploration/Survey</li> <li>▪ Utility/Pipeline Control and Inspection</li> <li>▪ Business Executive Flight Service</li> <li>▪ Manufacturing and Distribution</li> <li>▪ Express Delivery Service</li> <li>▪ Air Cargo</li> </ul>	
<p><b>Destination and Special Events</b></p>	<ul style="list-style-type: none"> <li>▪ Tourism and Access to Special Events</li> <li>▪ Intermodal Connections (rail/ship)</li> <li>▪ Special Aeronautical (skydiving/airshows)</li> </ul>	

Source: May 2012. FAA. *General Aviation Airports: A National Asset*.

### 2.2.2 Airport Overall Function Value - Weighing the Function Categories

For the SPR model certain functions are prioritized higher than others, as they serve a greater societal need, thus a weighted value is given to each asset function category.

The five (5) asset function categories were analyzed and ranked by their purpose in serving the needs of the communities and the State. A weight was applied to each of the asset function categories from 1-5, with five (5) as the highest and one (1) as the lowest. **Table 5** outlines the weight of each of five (5) asset function categories.

**Table 5: Asset Function Categories Weight**

Functions/Services	Weight (Score)
Emergency Preparedness & Response	5
Critical Community Access	4
Other Aviation-Specific Functions	2
Commercial, Industrial & Economic Activities	3
Destination & Special Events	1

Source: McFarland Johnson, Inc, 2023.

In evaluating the functional categories, it was deemed that emergency preparedness & response is the highest priority function that an airport can provide. This category is given a weighted value of five (5). Airports that have an emphasis on aeromedical flights, emergency diversions, aerial firefighting support, and disaster relief search and rescue ensure that all communities of Maine have access to critical state and federal functions.

The 2<sup>nd</sup> top-ranked airport functional emphasis is critical community access. This category is given a weighted value of four (4). The landscape of Maine is composed of small islands to big cities and everywhere in between.<sup>5</sup> Airports that provide critical community access are essential in providing support to all communities across Maine with remote populations and island access, air taxi and charter services, and essential scheduled air service. Regarding critical community access, aviation provides a form of transportation that roads, bridges, and rail cannot support either due to a natural disaster or the physical speed of the mode of transportation.

The 3<sup>rd</sup> ranked airport functional emphasis is commercial, industrial, and economic activities for the community and the State. This category is given a weighted value of three (3). These activities support MaineDOT’s goals in investing in transportation initiatives that support economic opportunities for communities and businesses across Maine. Additionally, this category provides economic sustainability for the State.

The 4<sup>th</sup> ranked airport functional emphasis is other aviation-specific functions. This category is given a weighted value of two (2). These activities include self-piloted business flights; corporate flights; flight instruction; personal flying; charter passenger services; aircraft, avionics manufacturing and maintenance; aircraft storage; and aerospace engineering and research. This function helps to promote opportunities for nurturing key system components, including aviation workforce development.

<sup>5</sup> American Public Transportation Association. Maine’s cities, Islands and Towns Depend on Public Transportation to Stay Connected. September 6, 2023. Date Accessed November 28, 2023. [Maine's Cities, Islands, and Towns Depend on Public Transportation to Stay Connected - American Public Transportation Association \(apta.com\)](https://www.apta.com/Maine-s-Cities-Islands-and-Towns-Depend-on-Public-Transportation-to-Stay-Connected)

The 5<sup>th</sup> ranked airport functional emphasis category is destination and special events. This category is given a weighted value of one (1).<sup>6</sup> This function helps to promote the economic development of tourism in the State of Maine which is an economic driver for the State with an annual aviation visitor spending of \$668.3 million in 2022.<sup>7</sup> Although all functions are valuable it was identified that most tourists access the State through commercial service airports, roads, and bridges except for those General Aviation airports that provide critical community access which is already ranked high.

### 2.2.3 SPR Model Element – Airport Overall Function Value and Integration into SPR Dashboard

**Table 6** illustrates a sample of the airport overall function value worksheet metric from the SPR model. This is for general purposes only as it is an illustration of the model set-up, the data displayed should not be regarded as exact.

**Table 6: Airport Overall Function Value**

Airport Overall Function Value									
Airport Code	Airport Name	Asset Role Designation	How much emphasis does the airport place on the performance of each of the functional categories? (1)						
			Emergency Preparedness & Response	Critical Community Access	Other Aviation Specific Functions	Commercial, Industrial and Economic Activities	Destination and Special Events	Total Score	Conversion to 10 points
BGR	Bangor International Airport	Commercial Service - Primary	0.75	0.50	0.75	0.50	0.50	9.25	6.2
RKD	Knox County Regional Airport	Commercial Service - Primary	0.50	1.00	0.50	0.50	0.25	9.25	6.2
PWM	Portland Jetport	Commercial Service - Primary	0.75	1.00	0.50	1.00	1.00	12.75	8.5
PQJ	Presque Isle International Airport	Commercial Service - Primary	0.50	0.50	0.50	0.50	0.75	7.75	5.2
AUG	Augusta State Airport	Commercial Service - Non-Primary	0.75	0.00	1.00	0.50	0.25	7.50	5.0
BHB	Hancock County-Bar Harbor Airport	Commercial Service - Non-Primary	0.25	0.75	0.50	0.25	0.25	6.25	4.2
LEW	Auburn-Lewiston Municipal	General Aviation - Regional	0.50	0.50	0.75	0.50	0.50	8.00	5.4
SFM	Sanford Seacoast Regional Airport	General Aviation - Regional	0.50	0.50	0.75	0.25	0.50	7.25	4.9
BST	Belfast Municipal Airport	General Aviation - Local	0.00	0.25	0.75	1.00	0.50	6.00	4.0
0B1	Bethel Regional Airport	General Aviation - Local	0.50	0.25	0.00	0.75	1.00	6.75	4.5
B19	Biddeford Municipal Airport	General Aviation - Local	0.25	0.00	1.00	0.50	0.75	5.50	3.7
BXM	Brunswick Executive	General Aviation - Local	0.25	0.25	0.75	0.25	0.25	4.75	3.2
OWK	Central Maine Airport of Norridgewock	General Aviation - Local	0.00	0.25	0.75	1.00	0.50	6.00	4.0
OLD	Dewitt Field - Old Town Municipal Airport	General Aviation - Local	0.00	0.25	0.50	0.75	1.00	5.25	3.5
1B0	Dexter Regional Airport	General Aviation - Local	1.00	0.75	0.25	0.50	0.00	10.00	6.7
I2G	Eastern Slope Regional Airport	General Aviation - Local	0.50	0.75	0.25	1.00	0.00	9.00	6.0
HUL	Houlton International Airport	General Aviation - Local	0.25	0.25	0.50	0.25	0.25	4.25	2.8
LRG	Lincoln Regional Airport	General Aviation - Local	0.25	0.25	0.50	0.25	0.00	4.00	2.7
MLT	Millinocket Municipal Airport	General Aviation - Local	0.25	0.00	0.25	0.50	0.25	3.50	2.3
B1B	Oxford County Regional Airport	General Aviation - Local	0.25	0.25	0.75	0.25	0.25	4.75	3.2
2B7	Pittsfield Municipal Airport	General Aviation - Local	0.25	0.25	0.75	0.25	0.25	4.75	3.2
WVL	Waterville Robert LaFleur Airport	General Aviation - Local	0.50	0.75	0.75	0.50	0.75	9.25	6.2
IWI	Wiscasset Airport	General Aviation - Local	0.25	0.00	0.25	0.25	0.50	3.00	2.0
CAR	Caribou Municipal Airport	General Aviation - Basic	0.25	0.00	0.25	0.25	0.00	2.50	1.7
EPM	Eastport Municipal Airport	General Aviation - Basic	1.00	1.00	1.00	1.00	1.00	15.00	10
3B1	Greenville Municipal Airport	General Aviation - Basic	0.50	0.25	0.00	0.75	1.00	6.75	4.5
MVM	Machias Valley Airport	General Aviation - Basic	0.75	1.00	0.25	0.50	0.00	9.75	6.5
59B	Newton Field Airport	General Aviation - Basic	1.00	0.50	0.00	0.75	0.25	9.50	6.4
FVE	Northern Aroostook Regional Airport	General Aviation - Basic	0.50	0.25	0.75	0.25	0.50	6.25	4.2
PNN	Princeton Municipal Airport	General Aviation - Basic	0.50	0.50	0.25	0.25	0.00	5.75	3.9
8B0	Steven A Bean Municipal Airport	General Aviation - Basic	0.50	0.50	0.25	0.25	0.25	6.00	4.0
B21	Sugarloaf Regional Airport	General Aviation - Basic	0.50	0.25	0.50	0.25	0.25	5.50	3.7
44B	Charles A Chase Memorial Airport	General Aviation - Unclassified	0.00	0.00	0.25	0.00	0.00	0.50	0.3
57B	Islesboro Airport	General Aviation - Unclassified	0.25	0.25	0.25	0.00	0.00	2.75	1.8
93B	Stonington Municipal Airport	General Aviation - Unclassified	0.75	1.00	1.00	0.00	0.25	10.00	6.7

Source: McFarland Johnson, Inc, 2023.

<sup>6</sup> US Department of Transportation. General Aviation Airports: A National Asset. May 2012. Accessed November 27, 2023.

[https://www.faa.gov/sites/faa.gov/files/airports/planning\\_capacity/ga\\_study/2012AssetReport.pdf](https://www.faa.gov/sites/faa.gov/files/airports/planning_capacity/ga_study/2012AssetReport.pdf)

<sup>7</sup> MaineDOT Bureau of Planning. Maine State Aviation System Plan Economic Impact Analysis & Case Studies Final Technical Report. October 2023.

It is highly recommended MaineDOT provide new airport function scores for each of the 35 airports using the tool in the workbook "Airport Overall Function Value". The original data was provided by sponsors through surveys, and it was found to have inconsistencies in the data reported. This information should be discussed at the CIP meetings and continuously refined.

The airport overall function tool is set up for the user to input the airport’s emphasis on the function from the pull-down menu of the five (5) functional categories by airport. The score available is from 1 – 0 with 1 being very high emphasis and 0 being no emphasis. **Table 7** outlines the scoring of the airport emphasis on functions performance.

**Table 7 : Airport Emphasis Level on the Functional Performance**

Functional Performance Value	Emphasis Level
1	Very High Emphasis
0.75	Moderately High Emphasis
0.5	Medium Emphasis
0.25	Low Emphasis
0	No Emphasis

Source: McFarland Johnson, Inc, 2023.

Once the user inputs the scores by airport, the total is calculated using the weight of the functional categories.

**Airport Overall Function Total Score**

$$\text{Emergency Preparedness} * 5 + \text{Critical Community Access} * 4 + \text{Other Aviation Specific functions} * 2 + \text{Commercial, Industrial and Economic Activities} * 3 + \text{Destination and Special Events} * 1$$

The maximum score that would be available for an airport would be 15. That score is then converted to 10 points in (Column J) in the "Airport Overall Function Value" worksheet. The "SPR Dashboard" (Column J) is automatically filled in with the results to correspond to the airport for the CIP project listed.

**2.3 Airport Overall Economic Output**

The airport's overall economic output metric calculates a value based on the 2022 *Maine State Aviation System Plan Economic Impact Analysis and Case Studies* technical report and compares its values to all the airports within the System.<sup>8</sup> The principal concept for this metric is that the greater the economic output an airport has, the greater benefit it provides the local community and the State.

**2.3.1 Airport Overall Economic Output - Background**

In 2022, the MaineDOT in association with R.A. Wiedemann & Associates and McFarland Johnson, Inc published an economic impact analysis for all the 35 airports within the System. The results of

<sup>8</sup>MaineDOT Bureau of Planning. Maine State Aviation System Plan Economic Impact Analysis & Case Studies Final Technical Report. October 2023.

the study were used for the SPR model to calculate the airport’s overall economic output. Economic output is the measure of the combined financial impact of direct and induced spending.<sup>9</sup>

### 2.3.2 SPR Model Element –Airport Overall Economic Output and Integration into SPR Dashboard

A percentile rank for each airport is calculated in (Column E) which compares its value to all other airport values within the System. The percentile rank is then converted to a 10-point structure (Column F). The “SPR Dashboard” (Column K) is automatically filled in with the results to correspond to the airport where the project is listed. For any updates on the economic output, the user must input each airport’s new values in “Airport Overall Economic Output” (Column D) and change the title to the year in which it was derived. **Table 8** illustrates a sample of the airport overall economic output worksheet from the SPR model.

**Table 8 : Airport Overall Economic Output Worksheet**

Airport Overall Economic Output					
A	B	C	D	E	F
Airport Code	Airport Name	Asset Role Designation	Economic Output (2022)	Percentile Rank	Conversion to 10 Points
BGR	Bangor International	Commercial Service - Primary	\$341,980,000	94%	9.4
RKD	Knox County Regional	Commercial Service - Primary	\$41,118,600	89%	8.9
PWM	Portland International Jetport	Commercial Service - Primary	\$1,175,466,500	97%	9.7
PQI	Presque Isle International	Commercial Service - Primary	\$83,501,100	92%	9.2
AUG	Augusta State	Commercial Service - Non-Primary	\$14,005,600	75%	7.5
BHB	Hancock County/Bar Harbor	Commercial Service - Non-Primary	\$18,166,700	83%	8.3
LEW	Auburn/Lewiston Municipal	General Aviation - Regional	\$16,282,900	81%	8.1
SFM	Sanford Seacoast Regional	General Aviation - Regional	\$15,032,100	78%	7.8
BST	Belfast Municipal	General Aviation - Local	\$1,711,200	33%	3.3
OB1	Bethel Regional	General Aviation - Local	\$1,484,100	28%	2.8
B19	Biddeford Municipal	General Aviation - Local	\$3,013,100	58%	5.8
BXM	Brunswick Exec	General Aviation - Local	\$21,722,500	86%	8.6
OWK	Central Maine /Norridgewock	General Aviation - Local	\$713,700	14%	1.4
OLD	Dewitt Field/Old Town Municipal	General Aviation - Local	\$6,300,500	67%	6.7
1B0	Dexter Regional	General Aviation - Local	\$2,558,600	50%	5.0
IZG	Eastern Slopes Regional	General Aviation - Local	\$998,400	17%	1.7
HUL	Houlton International	General Aviation - Local	\$2,484,900	47%	4.7
LRG	Lincoln Regional	General Aviation - Local	\$5,311,900	64%	6.4
MLT	Millinocket Municipal	General Aviation - Local	\$1,820,100	36%	3.6
81B	Oxford County Regional	General Aviation - Local	\$2,598,900	53%	5.3
2B7	Pittsfield Municipal	General Aviation - Local	\$7,440,200	72%	7.2
WVL	Waterville Robert Lafleur	General Aviation - Local	\$6,593,600	69%	6.9
IWI	Wiscasset	General Aviation - Local	\$1,611,700	31%	3.1
CAR	Caribou Municipal	General Aviation - Basic	\$2,201,900	44%	4.4
EPM	Eastport Municipal	General Aviation - Basic	\$2,199,300	42%	4.2
3B1	Greenville Municipal	General Aviation - Basic	\$560,100	11%	1.1
MVM	Machias Valley	General Aviation - Basic	\$1,143,200	19%	1.9
59B	Newton Field	General Aviation - Basic	\$2,614,300	56%	5.6
FVE	Northern Aroostook Regional	General Aviation - Basic	\$1,469,800	25%	2.5
PNN	Princeton Municipal	General Aviation - Basic	\$1,915,600	39%	3.9
8B0	Stephen A Bean Municipal	General Aviation - Basic	\$4,692,800	61%	6.1
B21	Sugarloaf Regional	General Aviation - Basic	\$1,196,400	22%	2.2
44B	Charles A Chase Jr Memorial Field	General Aviation - Unclassified	\$120,100	8%	0.8
57B	Islesboro	General Aviation - Unclassified	\$93,200	6%	0.6
93B	Stonington Municipal	General Aviation - Unclassified	\$24,800	3%	0.3

Source: McFarland Johnson, Inc, 2023.

<sup>9</sup> MaineDOT Bureau of Planning. Maine State Aviation System Plan Economic Impact Analysis & Case Studies Final Technical Report. October 2023.

## 2.4 Airport Sponsor Performance Metrics

The sponsor is responsible for their airport's functionality, adherence to required FAA operational standards, and participation within the MaineDOT SASP. An airport sponsor's willingness to comply with all the rules, regulations, standards, and state and federal recommendations is an important contributing factor to their success within the System. The System of Airports is an interconnected transportation network that supports communities across Maine and connects Maine to the rest of the United States and globally. The actions of a single airport not participating in the standards and recommendations can affect the overall collective performance of the System.

### 2.4.1 SPR Model Element – Airport Sponsor Performance Metrics and Integration into SPR Dashboard

A scoring metric was established to identify performance metrics to airports to be applied to MaineDOT General Aviation Airport Annual Inspection Report Card.

The scoring was based on a 0.01 to 1.00 scale with a low score of 0.01 and a high score of 1. The score was then incorporated into the "SPR Dashboard" in (Column L) corresponding to the airport, and into the calculations of the total airport score and acts as a penalty factor. If the sponsor scores anything below a one (1) in the sponsor's performance metrics, it will reduce the total airport score by a certain percentage.

Currently, there is a TBD in the "Airport Sponsor Performance Metrics" and the value for each airport is currently set to 1 as a placeholder in the "Airport Sponsor Performance Metrics" Worksheet (Column D). It was determined these metrics were best suited to be excluded from the SPR ranking model as it represents more qualitative factors that cannot be easily quantified on a statewide level.

## 3. Project Specific Scoring Criteria

A project's significance is key to the sustainability and viability of its airport. Some projects, depending upon their financial cost, economic output, functions, sustainability, impacts on safety and security, and effect on the overall operations of the airport, will score higher than others. The elements of the project-based score can be classified into (3) categories:

- Component, Safety, Operational Functionality – Component Value (M) and PCI Value (N)
- Project Function Value
- Project Based Financial Values – Project Cost Ranking (O), State Share ROI (Q), Project Revenue ROI (R)

**Table 9** illustrates a sample of the project specific scoring criteria and their values on the SPR dashboard.

**Table 9 : Project Specific Scoring Criteria - Sample**

Project-Specific Component, Safety, and Operational Functionality		Project Function Value	Project-Based Financial Values		
M	N	O	P	Q	R
Component Value	PCI Value	Project Function Value	Project Cost Ranking	State Share ROI	Project Revenue ROI
7.2	8.0	9.3	10.0	9.8	0.0
9.4	1.0	7.8	1.0	9.5	0.0
6.7	1.0	7.5	8.0	9.0	0.0
8.9	6.0	7.8	6.0	9.5	0.0
7.2	6.0	7.5	7.0	9.5	0.0
7.8	1.0	5.7	5.0	9.5	0.0
1.7	1.0	5.0	3.0	9.5	0.0
7.8	1.0	8.5	9.0	9.5	0.0
10.0	8.0	8.0	3.0	9.5	0.0
2.2	10.0	2.5	9.0	9.5	0.0

Source: McFarland Johnson, Inc, 2023.

### 3.1 Component Value

The component scoring criteria of the project prioritizes the location and/or the type of project that contributes to the safe operation of the US airport and airway system.<sup>10</sup> This aligns with the fundamental objective of the MaineDOT to increase safety and sustainability across the multimodal transportation system. The scoring favors elements that pertain to the safety, security, and sustainability of an airport at a higher significance than other components that are not critical to the airport’s overall function.

#### 3.1.1 Component Value - Background

The values of the listed components in the SPR model were derived from the FAA National Priority Rank component element. The FAA determined that the development area, planning study, or type of equipment of the project’s focus was an important factor in the FAA National Priority Ranking system.<sup>11</sup> Thus, in keeping with the overarching principles of the FAA and the MaineDOT goals, adding a component factor in the SPR model adds a critical piece to the total project scoring criteria. **Table 10** outlines the component value used in the SPR model.

<sup>10</sup> US Department of Transportation Federal Aviation Administration. Order Number 5090.5. September 3, 2019

<sup>11</sup> US Department of Transportation Federal Aviation Administration. Order Number 5090.5. September 3, 2019.

**Table 10 : Component Value**

Component/Location/Type of Project	FAA Ranking	Ranking Converted to 10	Max Score
N/A	0	0.0	100
Multi-Location Pavement	90	9.0	Conversion score Max
Access Road	20	2.0	10
Airfield	25	2.5	Conversion Rate
Airport Master Planning	70	7.0	0.10
ALP (Airport Layout Plan)	70	7.0	
Apron	65	6.5	
Beacon	85	8.5	
Building	32	3.2	
Building - SRE	32	3.2	
Building and Equipment (Control Tower)	65	6.5	
Drainage	62	6.2	
Easement	70	7.0	
Equipment	85	8.5	
Gates	22	2.2	
Ground Transportation	20	2.0	
Hanger	22	2.2	
Helipad/Heliport	65	6.5	
Homes	72	7.2	
Jet bridge	22	2.2	
Land Acquisition	70	7.0	
Landside	15	1.5	
Lighting - Airfield	62	6.2	
Marking/Signage	90	9.0	
Metro Area Planning	60	6.0	
New Airport	45	4.5	
Noise	0	0.0	
Obstruction Removal	100	10.0	
People Mover	20	2.0	
Plan/Study	60	6.0	
Permitting	60	6.0	
Perimeter Fence	85	8.5	
Privatization Planning	65	6.5	
Public Building	62	6.2	



Component/Location/Type of Project	FAA Ranking	Ranking Converted to 10	Max Score
Rail	20	2.0	
Runway	90	9.0	
Sealane	70	7.0	
Seaplane Base	70	7.0	
Security	85	8.5	
Sensors - Airfield	85	8.5	
Service/Perimeter Road	15	1.5	
State/Regional Planning	65	6.5	
Taxilane	60	6.0	
Taxiway	80	8.0	
Terminal	22	2.2	
Vertical/Visual Guidance System	68	6.8	
Wildlife Fencing	85	8.5	
Unknown	1	0.1	

Source: McFarland Johnson, Inc , 2023 and FAA Formulation of the NPIAS and ACIP, Order Number 5090.5, September 2019.

**Note to the User for Component Choice**

When selecting the component for the projects listed, it is recommended to work from the description of the project and keep in mind the location first from the pull-down choices. For example, if the description states “Environment Assessment – Runway 13-31” then the user would choose the runway option. If there is more than one location and/or type of project listed in the description (i.e. Environmental assessment for Runway XX-XX off airport easement acquisition and obstruction removal) the user should choose the location first, and if none is available then the type of project is either an easement or obstruction removal whichever is the highest value of the choices.

**Clarification on Component Choices**

Below is a list of specific component choices with a more detailed explanation to help guide the user:

- Security – Involves project types that are inclusive of security requirements for both the terminal and the airfield (i.e., Exit portals, security controls, terminal security access egress controls, etc.)
- Terminal – If an item is not listed in the drop-down list but is in the terminal the user should input terminal for the cell.
- Unknown – If there is no description to accompany the project the user should choose unknown from the drop-down menu.

- Miscellaneous – If the component is not listed, this option is for miscellaneous types of projects.
- Multi-Location Pavement – That covers projects that include multiple airfield pavement areas (i.e. Apron and Runway).

There is the ability for MaineDOT to add in additional component choices on the “Component & PCI Reference” worksheet. Input in the Component/Location/Type of Project (Column A) the value and in the FAA Value (Column B) and the score will automatically convert to 10-points in the Ranking Converted to 10. Save and Refresh all in the excel document.

### 3.1.2 SPR Model Element – Component Score and Integration into SPR Dashboard

**Table 11** is a sample of projects and their values in the Project Based Component and PCI Value Worksheet. This is for general purposes only as it is an illustration of the model set-up, the data displayed should not be regarded as exact.

**Table 11 : Project Based Component and PCI Value Worksheet – Sample**

A	B	C	D	E	F	G	H
#	Airport Name	Code	Airport Category	Project Description	Component	Component Value	PCI Value
1	Bangor International	BGR	Commercial Service - Primary	Apron Lighting Study and Recommendation	Apron	7.2	8
2	Portland International Jetport	PWM	Commercial Service - Primary	Reconstruct Taxiways A, D, E, & F (S36)	Equipment	9.4	1
3	Augusta State	AUG	Commercial Service - Non-Primary	Design/Permit GA Apron	Planning	6.7	1
4	Hancock County/ Bar Harbor	BHB	Commercial Service - Non-Primary	2026- Purchase SRE Equip. (Sweeper and carrier vehicle)	Taxiway	8.9	6
5	Auburn/ Lewiston Municipal	LEW	General Aviation - Regional	Reconstruct Terminal Apron & Portion Tie-Down Apron Ph 1	Apron	7.2	6

#	Airport Name	Code	Airport Category	Project Description	Component	Component Value	PCI Value
6	Sanford Seacoast Regional	SFM	General Aviation - Regional	Second Runway Property Acquisition	Land	7.8	1
7	Houlton International	HUL	General Aviation - Local	Replace Jet A and Avgas Fuel Farms	Other	1.7	1
8	Lincoln Regional	LRG	General Aviation - Local	AMPU	Airport Master Planning	7.8	1
9	Caribou Municipal	CAR	General Aviation - Basic	Replace Jet A and Avgas Fuel Farms	Multi-Location	10	8
10	Machias Valley	MVM	General Aviation - Basic	AMPU	Access Road	2.2	10

Source: McFarland Johnson, Inc, 2023.

The component value located in the “Project Based Component and PCI” worksheet is designed to allow the user to choose from the component location and/type of project from the pull-down menu. Once the component is chosen a score is automatically populated in the “Component and PCI” worksheet (Column G).

A majority of the scoring values derives directly from the NPIAS ranking system component table. The value of the additional components is based on similarly structured components (i.e. Airport Master Plan was included FAA National Priority Ranking but not Airport Layout Plan (ALP) and the ALP is an essential part of the Airport Master planning, it was determined that it would be categorized as the same value as the master planning). The FAA National Priority Ranking component value is out of 100.<sup>12</sup> The points are then converted to a 10 – point scale in the “Project Based Component and PCI” Worksheet (Column G). The component value is automatically filled in on the “SPR Dashboard” in (Column M) to correspond directly with the project listed.

### 3.2 PCI Value

The pavement management program (PMP) for the State of Maine is essential to the functionality and safety of all 35 airports within the System. The State PMP is a high-cost endeavor for the State, with only a certain amount of funding available in a fiscally constrained environment.

The PCI value scoring criteria uses a weighted rank system based upon a base year PCI and a 5-year forecasted PCI. The scoring criteria incorporates safety as well as taking into consideration the life-cycle cost of the State’s PMP. This allows for the state to promote strategic improvements to asset conditions while integrating financial prudent decisions based upon a fiscally constrained environment.

<sup>12</sup> <sup>12</sup> US Department of Transportation Federal Aviation Administration. Order Number 5090.5. September 3, 2019.

### 3.2.1 PCI Value - Background

The Pavement Condition Index (PCI) is a numerical indicator that rates the structural integrity and surface condition of the pavement. The PCI is utilized to determine the maintenance and repair needs for the airport pavement. The rate of deterioration is projected to inform the life-cycle cost analysis for the most cost-effective M&R needs for the pavement.<sup>13</sup>

### 3.2.2 PCI Value - PCI Tool Worksheet

**Table 12 : PCI Tool Worksheet - Sample**

A	B	C	D	E	F	G	H
Pavement Location	Base Year Average PCI	Base Year M&R Recommendation Type	Forecasted 5-Year PCI	Year 5 M&R Recommendation	Base Year - 5 Year Forecast M&R Recommendation	Near-Term Stopgap Measure Required	M&R Level Score
Apron	83	Preventative Maintenance	74	Preventative Maintenance	Preventative Maintenance- Preventative Maintenance	No	4
Runway	85	Preventative Maintenance	60	Major Rehabilitation	Preventative Maintenance- Major Rehabilitation	No	5
Taxilane	64	Major Rehabilitation	60	Major Rehabilitation	Major Rehabilitation- Major Rehabilitation	No	2
Runway	60	Major Rehabilitation	58	Reconstruction	Major Rehabilitation- Reconstruction	No	3

Source: McFarland Johnson, Inc, 2023

**Table 12** is a sample of projects and their values in the PCI tool worksheet.

#### User-Input Columns

Below is a list of all the inputs for the PCI tool worksheet:

- **Pavement Location** – (Column A) - The user will choose from the pull-down menu the location of the pavement (apron, runway, taxilane, taxiway).
- **Base Year Average PCI** – (Column B) - The user will input the average base year PCI. There are multiple elements to a pavement area so obtaining the average PCI for the type of

<sup>13</sup> US Department of Transportation Federal Aviation Administration. Advisory Circular 150/5380-7B: Airport Pavement Management Program. October 10, 2014.

location gives more insight into the overall condition and integrity of the pavement location.

- **Forecasted 5 – Year PCI** – (Column D) - The user will input the 5- year (from the base year) forecasted PCI for the location.
- **Near-Term Stop-Gap Measure Required** – (Column G) The user will use the pull-down menu to state whether the project requires a Near-Term Stop Gap Measure with a “yes” or “no.” If the user selects “yes,” the initial work repair level score will be overridden and will automatically go to (5), the highest score. Although this is not a common occurrence, a stopgap measure is an urgent matter to usually control FOD or maintain safety until major rehabilitation can be performed. Since safety is the highest priority for airports, the overriding feature for the score is essential for a stopgap measure.

**Automatically Populated Columns**

- **Base Year M&R Recommendation** – (Column C) – This column automatically populates the M&R level based upon the Base Year PCI.
- **Forecasted 5-Year M&R Recommendation** – (Column E) – This column automatically populates the M&R level based upon the forecasted 5-Year PCI.
- **Base Year – 5 Year Forecast M&R Recommendation** – (Column F) – This column automatically populates the combination of the Base Year and the 5 – year Forecast M&R. The output of this column is what determines the M&R level value.
- **M&R Level Score** – Column H – This is the M&R level value.
- **M&R Level Score conversion to 10** – Column I – This is a converted score of the M&R level value to 10 points.

**3.2.3 - PCI Value - PCI Scoring Criteria Methodology**

The PCI tool was designed with consideration of the current base-year PCI score, the forecasted 5-year PCI score, and how that would affect the life-cycle cost analysis of the pavement, safety, and M&R requirements in the context of the financial feasibility for the System. **Table 13** outlines the ranges that are used for the PCI tool in determining the M&R level based upon the PCI score.

**Table 13 : PCI Score – Preventative Maintenance and Rehabilitation Level**

PCI Score	M&R Level
100 - 71	Preventative Maintenance
70 - 60	Major Rehabilitation
59 - 1	Reconstruction

Source: McFarland Johnson, Inc, 2023.

The scoring criteria is based on a scale of 1 – 5 (five (5) being the highest and one (1) being the lowest). The scoring criteria assesses the base year M&R requirements and forecasted 5-year M&R requirements. Pavement conditions deteriorate over time, therefore an evaluation of the current base year PCI and forecasted PCI scores without intervention demonstrates the life-cycle cost and M&R requirements needed to maintain a safe airport. **Table 14** outlines the categories and the values for the PCI scoring criteria.

**Table 14 : Base Year PCI – 5 – Year PCI M&R Level Value**

Base Year - 5-Year M&R Level	Value
Preventative Maintenance-Major Rehabilitation	5
Preventive Maintenance-Preventive Maintenance	4
Major Rehabilitation-Reconstruction	3
Major Rehabilitation-Major Rehabilitation	2
Reconstruction-Reconstruction	1

Source: McFarland Johnson, Inc, 2023.

The scoring criterion is guided by the cost for the System’s PMP over a 20-year period. The calculations were determined by the cost-range of each work repair level (Preventative Maintenance, Major Rehabilitation, Reconstruction) and the time-period in which those repairs would last. Additional consideration was given to the safety factor of the pavement needs. **Table 15** outlines the cost and the time range of each M&R work repair levels from a system-wide perspective.

**Table 15 : State of Maine PMP Life-Cycle Cost Analysis – M&R Level**

Base Year M&R - 5-Year M&R	System Cost Low	System Cost High	Time Low (Yr)	Time High (Yr)	Low Whole System Cost (Time*Cost)	High Whole System Cost (Time * Cost)	High - Low (Diff)
Preventative Maintenance-Preventative Maintenance	\$250,000	\$500,000	2	5	\$87,500,000	\$70,000,000	\$17,500,000
Preventative Maintenance-Major Rehabilitation	\$500,000	\$1,000,000	5	10	\$70,000,000	\$70,000,000	\$0
Major Rehabilitation-Major Rehabilitation	\$1,000,000	\$2,500,000	10	15	\$70,000,000	\$116,666,667	\$46,666,667
Major Rehabilitation-Reconstruction	\$2,500,000	\$5,000,000	15	20	\$116,666,667	\$175,000,000	\$58,333,333
Reconstruction - Reconstruction	\$5,000,000	\$10,000,000	20	20	\$175,000,000	\$350,000,000	\$175,000,000

Source: McFarland Johnson, Inc, 2023.

**Preventative Maintenance – Preventative Maintenance (4):** The M&R is most cost effective over the lifetime of the pavement maintaining a higher level of service to the System and has the capability to cover more projects with the State of Maine PMP.

**Preventative Maintenance – Major Rehabilitation (5).** This M&R captures the opportunity to upgrade the pavement before it reaches the critical major rehabilitation threshold. If the pavement is not taken care of within the next 5 years, it will reach a major rehabilitation level which will be more costly. Overall, it is a cost saving measure for the State of Maine PMP.

**Major Rehabilitation – Major Rehabilitation (2)** A major rehabilitation effort is already costly for the System. As the pavement goes into Major Rehabilitation it will stay at that level for some time and the capital costs remain the same during that time period, therefore the urgency to capture the cost saving opportunity is not present.

**Major Rehabilitation – Reconstruction (3)** The M&R at this stage allows for the airport to capitalize on the cost of rehabilitation in the near term. Reconstruction is the most expensive option within the State of Maine PMP. Major Rehabilitation is a restorative effort that will allow the pavement to maintain a higher level of service to the System.

**Reconstruction – Reconstruction (1)** The M&R at a current state of reconstruction is the highest cost measure for the State of Maine PMP. It is highly encouraged that the airport does not let the pavement get to the level of service needed. For those pavements that were neglected, they will need to wait until properly maintained facilities are addressed to prevent unsafe conditions, stop-gap measures may need to be implemented.

### 3.2.4 SPR Model Element -PCI Value and Integration into SPR Dashboard

Using the PCI Tool worksheet, the user will input the PCI value into the design of the PCI value “Project Based Component and PCI” worksheet (Column H) for the associated project. If there is no PCI element to the project the user is requested to put a 1 in (Column H). Since not all projects involve a PCI component, a value of one (1) allows the project to garner at least some points for the PCI column in the SPR dashboard. The PCI score is automatically filled in on the “SPR Dashboard” (Column N) to correspond directly with the project listed.

## 3.3 Project Function Value

The project specific function value is a key element in the overall SPR ranking model. This differs from the airport overall function value because rather than looking at the airport’s emphasis as a whole on the performance of each of the functional categories, it asks the question of how the project supports the performance of the function.

The purpose of this scoring criteria is to garner insight into the “why” this project is important. It aligns with the MaineDOT goals to understand current and future potential aviation system contributions to meeting expressed societal needs, emphasizing the exploration of the public value to justify the degree of state and federal investments and the intended purposes.

### 3.3.1 Project Function Value - Background

The airport specific function score utilizes the five (5) asset function categories defined by the FAA. See section **2.2.1 Airport Overall Function Value - Background** for more information on each of the function categories.

### 3.3.2 Project Function Value - Weighing the Function Categories

The scoring criteria for the project function applies weight to each one of the five (5) asset function categories. A project that supports a greater number of functions and/or scores higher on the weighted functions will garner a higher score. The same principles applied to the weight of each of five (5) function categories in the airport overall function value are applied to the scoring criteria for the project function value. More details on the justification of function category value can be found in **Section 2.2.2 Airport Overall Function Value – Weighing the Function Categories**.

### 3.3.3 SPR Model Element – Project Function Value and Integration into SPR Dashboard

**Table 16** illustrates a sample of the project function value in the SPR model in the “Project Function Value” worksheet. This is for general purposes only as it is an illustration of the model set-up, the data displayed should not be regarded as exact.

**Table 16 : Project Function Value – Sample**

Project Function Value											
CIP Project Information					How does the project support the performance of the functions below? (1 = Very Significantly, .75= Significantly, .5 = Moderately, .25 = Slightly, 0 = Does not support)						
Input Number	Airport Name	Airport Code	Asset Role	Project Description	Project Function Score – Emergency Preparedness & Response	Project Function Score – Critical Community Access	Project Function Score – Other Aviation Specific Functions	Project Function Score – Commercial, Industrial and Economic Activities	Project Function Score – Destination and Special Events	Total Project Function Score	Conversion to 10 Points
1	Bangor International	BGR	Commercial Service – Primary	Apron Lighting Study and Recommendation	1	1	0.75	1	0.5	14	9.3
2	Portland International Jetport	PWM	Commercial Service – Primary	Reconstruct Taxiways A, D, E, & F (S36)	1	1	0.5	0.5	0.25	11.75	7.8
3	Augusta State	AUG	Commercial Service – Non-Primary	Design/Permit GA Apron	1	0.75	0.5	0.5	0.75	11.25	7.5
4	Hancock County/Bar Harbor	BHB	Commercial Service – Non-Primary	2026-Purchase SRE Equip. (Sweeper and carrier vehicle)	0.75	0.75	1	0.75	0.75	11.75	7.8
5	Auburn/Lewiston Municipal	LEW	General Aviation Regional	Reconstruct Terminal Apron & Portion Tie-Down Apron Ph 1	0.75	0.75	0.75	0.75	0.75	11.25	7.5
6	Sanford Seacoast Regional	SFM	General Aviation Regional	Second Runway Property Acquisition	0.25	0.5	1	1	0.25	8.5	5.7
7	Houlton International	HUL	General Aviation Local	Replace Jet A and Avgas Fuel Farms	0.5	0.25	0.25	1	0.5	7.5	5.0
8	Lincoln Regional	LRG	General Aviation Local	AMPU	0.75	1	0.75	1	0.5	12.75	8.5
9	Caribou Municipal	CAR	General Aviation Basic	Replace Jet A and Avgas Fuel Farms	1	1	0.5	0.5	0.5	12	8.0
10	Machias Valley	MVM	General Aviation Basic	AMPU	0.25	0.25	0.25	0.25	0.25	3.75	2.5

Source: McFarland Johnson, Inc, 2023.

The “Project Function Value” worksheet is structured for the user to score how the project supports the five (5) FAA defined functional categories from the pull-down menu. The score that is available is from 1 – 0 with one (1) being the project very significantly supports the function to zero (0) being the project does not support the function at all. **Table 17** outlines the values for each support level.

The user must input at least one (1) value above zero (0) for any of the asset function categories by project. If there are no values entered for at least one (1) of the functions, the Total Project Function Score (Column K) cell for the project will be highlighted red to notify the user of the error.



**Table 17 : Project Function Support Level Value**

Project Function Value	Support Level
1	Very Significantly
0.75	Significantly
0.5	Moderately
0.25	Slightly
0	Does Not Support

Source: McFarland Johnson, Inc, 2023

Once the user inputs the scores by project, the total is calculated using the weight of the function categories:

**Project Function Total Score**

**Emergency Preparedness \* 5 + Critical Community Access \*4 + Other Aviation Specific functions \* 2 + Commercial, Industrial and Economic Activities \* 3 + Destination and Special Events \*1**

The max score that would be available for the project would be 15. The score is then converted into 10 points (column L) in the “Project Function Value” worksheet and is automatically filled in on the “SPR Dashboard” in (Column O) to correspond directly with the project listed.

**3.4 Project Financial Values**

The scoring criteria for the project financial values are composed of three (3) elements: Project Cost Ranking, State Share ROI, and Project Revenue ROI. These criteria work in conjunction with one another to get a comprehensive picture of the fiscal impact of the specific project.

**3.4.1 Project Cost Ranking**

The project cost ranking criteria measures realistic, fiscally constrained solutions by ranking the fiscal impact of the project cost to the overall System.

**3.4.1.1 Project Cost Ranking – Background**

This criterion looks at the total cost of all the proposed CIP projects and ranks the state share project cost as it compares to other state share project cost values in a range of percentiles. In a fiscally constrained environment, MaineDOT only has a certain amount of funding available to utilize across the entire System. Under the principle that there is only a limited amount of state funding available, prioritization towards a lower MaineDOT cost share would promote a larger financial reach across the whole System.

**3.4.1.2 SPR Model Element – Project Cost Ranking and Integration into SPR Dashboard**

**Table 18** is a sample of the projects and their values in the Project Cost Ranking worksheet. This is for general purposes only as it is an illustration of the model set-up, the data displayed should not be regarded as exact.

**Table 18 : Project Cost Ranking – Sample**

Project Cost Ranking						
A	B	C	D	E	F	G
#	Airport Name	Airport Code	Asset Role	Project Description	State Share	Rank
1	Bangor International	BGR	Commercial Service - Primary	Apron Lighting Study and Recommendation	\$1,875	10
2	Portland International Jetport	PWM	Commercial Service - Primary	Reconstruct Taxiways A, D, E, & F (S36)	\$665,000	1
3	Augusta State	AUG	Commercial Service - Non-Primary	Design/Permit GA Apron	\$27,500	8
4	Hancock County/Bar Harbor	BHB	Commercial Service - Non-Primary	2026-Purchase SRE Equip. (Sweeper and carrier vehicle)	\$45,000	6
5	Auburn/Lewiston Municipal	LEW	General Aviation - Regional	Reconstruct Terminal Apron & Portion Tie-Down Apron Ph 1	\$38,000	7
6	Sanford Seacoast Regional	SFM	General Aviation - Regional	Second Runway Property Acquisition	\$52,500	5
7	Houlton International	HUL	General Aviation - Local	Replace Jet A and Avgas Fuel Farms	\$62,500	3
8	Lincoln Regional	LRG	General Aviation - Local	AMPU	\$16,650	9
9	Caribou Municipal	CAR	General Aviation - Basic	Replace Jet A and Avgas Fuel Farms	\$62,500	3
10	Machias Valley	MVM	General Aviation - Basic	AMPU	\$16,650	9

Source: McFarland Johnson, Inc, 2023.

The “Project Cost by Ranking” worksheet is set up to automatically populate from the CIP Project information inputs from the “SPR Dashboard” worksheet. The user does not have to input any information as the results can be found the “Project Cost by Ranking” worksheet (Column G). The score is automatically populated into the “SPR Dashboard” worksheet (Column P) to correspond directly with the project listed.

The scores that are available for each of the projects are 1 – 10. All the state share costs for each of the projects are automatically calculated into percentile ranges (i.e., 10<sup>th</sup> percentile, 20<sup>th</sup> percentile, 30<sup>th</sup> percentile, etc.) The highest value ten (10) is given to the state share costs that fall into in the lowest percentile (9<sup>th</sup> – 1<sup>st</sup> percentile) and lowest value one (1) is given to the share costs that fall into the highest percentile (91<sup>st</sup> – 100<sup>th</sup> percentile). This is a dynamic tool where the percentile ranges change based upon the CIP Project information inputs into the “SPR Dashboard” (Column H). Favorability is given to less costly projects as they would require fewer financial contributions from the state in a fiscally conservative environment.

**Table 19** is a sample of the Project Cost Ranking worksheet. This is for general purposes only as it is an illustration of the model set-up, the data displayed should not be regarded as exact.

**Table 19 Percentile Range – Sample**

Percentile Range			
Percentile	Top Range Percentile	Bottom Percentile	Ranking
Highest	\$665,000.00	\$665,000.00	1
90th	\$665,000.00	\$260,000.00	2
80th	\$260,000.00	\$93,000.00	3
70th	\$92,999.86	\$55,500.00	4
60th	\$55,500.00	\$48,000.00	5
50th	\$47,999.99	\$41,500.00	6
40th	\$41,500.00	\$33,800.00	7
30th	\$33,800.00	\$24,245.00	8
20th	\$24,244.99	\$14,986.67	9
10th	\$14,986.67	\$7,687.52	10
Bottom	\$7,687.51	\$1,875.00	10

Source: McFarland Johnson, Inc, 2023.

### 3.4.2 State Share ROI

This scoring criteria measures the MaineDOT state share match for the CIP project.

#### 3.4.2.1 State Share ROI - Background

MaineDOT only has a certain amount of funding available to utilize across the entire System and a lower investment in one project allows for a larger financial reach. A metric to measure the state share ROI was created to be in alignment with MaineDOT goals to use realistic, fiscally constrained financial contributions from federal, state, and local sponsors for optimal implantation while diversifying and stabilizing funding sources and percentages.

#### 3.4.2.2 SPR Model Element – State Share ROI and integration into SPR Dashboard

**Table 20** is a sample of projects and their values in the Project Based Financial Values worksheet. This is for general purposes only as it is an illustration of the model set-up, the data displayed should not be regarded as exact.

**Table A.20 – State Share ROI – Sample**

**Project Based Financial Values**

A	B	C	D	E	F	G	H	I
#	Airport Name	Airport Code	Asset Role	Project Description	Total Project Cost	State Share Cost	State Share	State Share ROI
1	Bangor International	BGR	Commercial Service - Primary	Apron Lighting Study and Recommendation	\$75,000	\$1,875	3%	9.8
2	Portland International Jetport	PWM	Commercial Service - Primary	Reconstruct Taxiways A, D, E, & F (S36)	\$13,300,000	\$665,000	5%	9.5
3	Augusta State	AUG	Commercial Service – Non-Primary	Design/Permit GA Apron	\$275,000	\$27,500	10%	9.0
4	Hancock County/Bar Harbor	BHB	Commercial Service – Non-Primary	2026-Purchase SRE Equip. (Sweeper and carrier vehicle)	\$900,000	\$45,000	5%	9.5
5	Auburn/Lewiston Municipal	LEW	General Aviation - Regional	Reconstruct Terminal Apron & Portion Tie-Down Apron Ph 1	\$760,000	\$38,000	5%	9.5
6	Sanford Seacoast Regional	SFM	General Aviation - Regional	Second Runway Property Acquisition	\$1,050,000	\$52,500	5%	9.5
7	Houlton International	HUL	General Aviation - Local	Replace Jet A and Avgas Fuel Farms	\$1,315,063	\$62,500	5%	9.5
8	Lincoln Regional	LRG	General Aviation - Local	AMPU	\$333,000	\$16,650	5%	9.5
9	Caribou Municipal	CAR	General Aviation - Basic	Replace Jet A and Avgas Fuel Farms	\$1,315,063	\$62,500	5%	9.5
10	Machias Valley	MVM	General Aviation - Basic	AMPU	\$333,000	\$16,650	5%	9.5

Source: McFarland Johnson, Inc, 2023.

The "Project Based Financial Value" worksheet is set up to automatically populate from the CIP Project Information inputs from the "SPR Dashboard" worksheet. The state share percentage is automatically calculated :

**State Share Percentage (Column H)**

**[1-(State Share Project Cost/Total Project Cost)] X 10**

The percentage is then converted into a 10-point score and automatically populated into (Column I). The value is automatically populated into the “SPR Dashboard” worksheet (Column Q) to correspond directly with the project listed.

### 3.4.3 Project Revenue ROI

The project revenue ROI is a measure of the estimated 10-year revenue from the project in regard to MaineDOT’s state share investment.

#### 3.4.3.1 Project Revenue ROI – Background

The Project Revenue ROI addresses the objective of the improvements to the financial sustainability of the airport. This score helps MaineDOT determine what the economic ROI for a project is by looking at the investment by the State in relationship to how the project will help the sustainability of the airport. For example, expanding the runway length would enable different aircraft to be able to land and take-off, leading to an increase in operations and increase in aeronautical revenue for the airport. The economic system of an airport is not a closed system, but rather an interlinked system as traffic increases, so does the economic output, income, taxes and employment opportunities. By the State investing a certain percentage into a project, such as a runway expansion, the 10-year revenue outlook is higher thus scoring higher.

#### 3.4.3.2 SPR Model Element – Project Revenue ROI and integration into SPR Dashboard

**Table 21** is a sample of projects and their values in the SPR dashboard. This is for general purposes only as it is an illustration of the model set-up, the data displayed should not be regarded as exact.

The “Project Based Financial Values” worksheet is set up to automatically populate from the CIP Project information inputs from the “SPR Dashboard” worksheet. The user will input in (Column J) the estimated 10-year revenue from the project. The project ROI value is automatically calculated:

#### Project Revenue ROI (K)

#### State Share Cost/Estimated 10 -Year Revenue from the Project

The value is automatically populated into the “SPR Dashboard” worksheet (Column R) to correspond directly with the project listed.

**Table 21: Project Revenue ROI – Sample**

A	B	C	D	E	F	J	K
#	Airport Name	Airport Code	Asset Role	Project Description	Total Project Cost	Estimated 10 - Year Project Revenue	Project Revenue ROI
1	Bangor International	BGR	Commercial Service - Primary	Apron Lighting Study and Recommendation	\$75,000		0.00

#	Airport Name	Airport Code	Asset Role	Project Description	Total Project Cost	Estimated 10 - Year Project Revenue	Project Revenue ROI
2	Portland International Jetport	PWM	Commercial Service - Primary	Reconstruct Taxiways A, D, E, & F (S36)	\$13,300,000		0.00
3	Augusta State	AUG	Commercial Service - Non-Primary	Design/Permit GA Apron	\$275,000		0.00
4	Hancock County/Bar Harbor	BHB	Commercial Service - Non-Primary	2026-Purchase SRE Equip. (Sweeper and carrier vehicle)	\$900,000		0.00
5	Auburn/Lewiston Municipal	LEW	General Aviation - Regional	Reconstruct Terminal Apron & Portion Tie-Down Apron Ph 1	\$760,000		0.00
6	Sanford Seacoast Regional	SFM	General Aviation - Regional	Second Runway Property Acquisition	\$1,050,000		0.00
7	Houlton International	HUL	General Aviation - Local	Replace Jet A and Avgas Fuel Farms	\$1,315,063		0.00
8	Lincoln Regional	LRG	General Aviation - Local	AMPU	\$333,000		0.00
9	Caribou Municipal	CAR	General Aviation - Basic	Replace Jet A and Avgas Fuel Farms	\$1,315,063		0.00
10	Machias Valley	MVM	General Aviation - Basic	AMPU	\$333,000		0.00

Source: McFarland Johnson, Inc, 2023.

The scoring of this criteria is based on the airports and MaineDOT’s interpretation of the ROI. Since this information might not be readily attainable or available it was determined that the criterion was not feasible for use in the SPR model design.

## 4. Total Airport Score, Total Project Score, Total Score and Ranking

The design of the SPR ranking system considered two major components of the projects: (1) the Airport Specific Scoring Criteria and (2) the Project Specific Scoring Criteria. Both components are combined to calculate a total project score which is then applied to the overall ranking and ranking by asset role. **Table 22** illustrates a sample of project and their total score and ranking in the SPR dashboard.

**Table 22 : Total Score and Ranking – Sample**

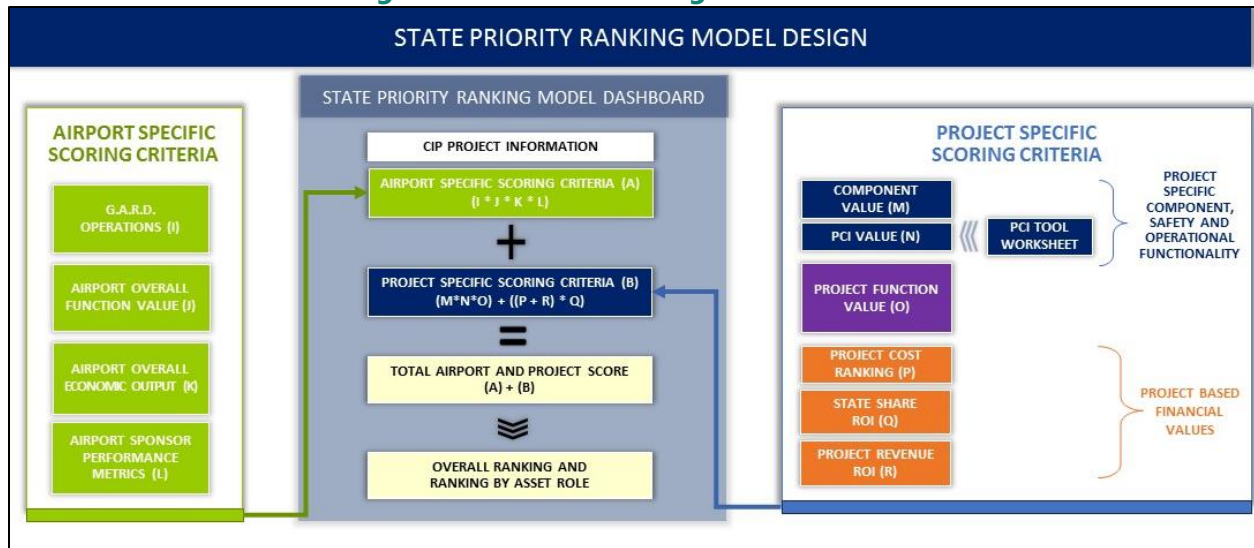
CIP Information	Total Project and Airport Score			Ranking	
	Asset Role	Airport Specific Based Score	Project Specific Based Score	Total Project and Airport Score	Overall Ranking
Commercial Service - Primary	223.2	161.2	384.4	2	2
Commercial Service - Primary	544.0	91.6	635.6	1	1
Commercial Service - Non-Primary	110.6	74.8	185.4	7	2
Commercial Service - Non-Primary	92.9	131.7	224.6	5	1
General Aviation - Regional	119.4	115.5	234.9	4	1
General Aviation - Regional	108.3	64.7	173.0	8	2
General Aviation - Local	16.0	26.0	42.0	10	2
General Aviation - Local	117.4	93.3	210.7	6	1
General Aviation - Basic	95.2	156.5	251.7	3	1
General Aviation - Basic	52.0	49.0	101.0	9	2

Source: McFarland Johnson, Inc, 2023.

### 4.1 Total Score

The total score is a cumulation of the values of the airport specific and the project specific scoring criteria. The total score is calculated using the methodology in **Figure 2** below.

Figure 2 SPR Model Design – Total Score



Source: McFarland Johnson, Inc 2023.

The total score is automatically populated into the “SPR Dashboard” worksheet (Column W) to correspond directly with the project listed.

### 4.2 Overall Ranking and Ranking by Asset Role

The overall ranking orders projects from the highest to the lowest score. The highest total score of all the projects is designated as the number one (1) ranked project. The ranking by asset roles only ranks the values within each asset role against each other. The highest score being ranked as one (1).



# Appendix D: Pathway to 2045

Masterplan and Airport Layout Plan Age

D-1

### Airport Master Plan and Airport Layout Plan Age

ID	Airport Name	MPU/ ALPU Year	Age of MPU/ALPU
<b>LEW</b>	Auburn/Lewiston Muni	2007	17
<b>AUG</b>	Augusta State	2015	9
<b>BGR</b>	Bangor Intl	2017	7
<b>BST</b>	Belfast Muni	2018	6
<b>OB1</b>	Bethel Rgnl	2012	12
<b>B19</b>	Biddeford Muni	2022	2
<b>BXM</b>	Brunswick Executive	2013	11
<b>CAR</b>	Caribou Muni	1999	25
<b>OWK</b>	Central Maine Rgnl	2008	16
<b>44B</b>	Charles A Chase Jr Memorial Field	No Master Plan or ALP Available	
<b>OLD</b>	Dewitt Fld- Old Town Muni	2020	4
<b>1B0</b>	Dexter Rgnl	2019	5
<b>IZG</b>	Eastern Slope Rgnl	2008	16
<b>EPM</b>	Eastport Muni	2007	17
<b>3B1</b>	Greenville Muni	2016	8
<b>BHB</b>	Hancock County-Bar Harbor	2011	13
<b>HUL</b>	Houlton Intl	2019	5
<b>57B</b>	Islesboro	No Master Plan or ALP Available	
<b>RKD</b>	Knox County Rgnl	2002	22
<b>LRG</b>	Lincoln Rgnl	2010	14
<b>MVM</b>	Machias Valley	2015	9
<b>MLT</b>	Millinocket Muni	2007	17
<b>59B</b>	Newton Field	2019	5
<b>FVE</b>	Northern Aroostook Rgnl	2019	5
<b>81B</b>	Oxford County Rgnl	2007	17
<b>2B7</b>	Pittsfield Muni	2017	7
<b>PWM</b>	Portland Intl Jetport	2019	5
<b>PQI</b>	Presque Isle Intl	2022	2
<b>SFM</b>	Sanford Seacoast Rgnl	2017	7
<b>8B0</b>	Steven A Bean Muni	2018	6
<b>93B</b>	Stonington Muni	No Master Plan or ALP Available	
<b>B21</b>	Sugarloaf Rgnl	2012	12
<b>WVL</b>	Waterville-Robert Lafleur	2014	10
<b>IWI</b>	Wiscasset	2016	8

Source: McFarland Johnson, Inc, 2024 and [Maine.gov/mdot/aviation](http://Maine.gov/mdot/aviation)

Note: Age based on 2024 calendar year

# Attachment 1: Maine State Aviation System Plan Economic Impact Analysis and Case Studies

Maine State Aviation System Plan Economic Impact Analysis & Case Studies

188 Pages



**MaineDOT**



Maine State Aviation System Plan  
**ECONOMIC IMPACT ANALYSIS & CASE STUDIES**  
Final Technical Report  
*MaineDOT Bureau of Planning*



**R.A. Wiedemann &  
Associates, Inc.**  
AVIATION CONSULTANTS



**McFarland Johnson**



# EXECUTIVE SUMMARY

Aviation is a vital cornerstone in shaping Maine's economy. The State's diverse range of airports, both commercial and general aviation, not only facilitate business operations, tourism, and general transportation needs but also substantially fuel our economic engine.

To quantify this contribution, the IMPLAN (Impact Analysis for Planning) modeling system was used. This economic tool assists in deciphering the intertwining relationships between aviation activity and our broader economic sectors. Broadly, the economic impact of aviation can be categorized into Direct, Indirect (or Induced), and Total output.

Direct impacts include the tangible effects directly rooted in aviation: jobs at our airports, associated payrolls, and output stemming from airport operations, capital spending, airport-based businesses, airline services, and off-airport spending of visitors arriving by air.

Induced impacts represent the ripple effects of these direct economic impacts as they flow through the wider economy. For instance, when aviation employees and air visitors spend their money at local businesses, they bolster jobs, payroll, and output across a spectrum of industries, from dining and retail to services like healthcare.

Total output marries these Direct and Induced impacts, giving a total picture of the value generated by the aviation industry within Maine. Additionally, the tax impacts offer insights into the state and local taxes produced by aviation activities. These tax revenues help fund public services and infrastructure that enhance our state's overall quality of life.

The table below (E-1) indicates that, in 2022, Maine's 35 system airports generated a grand total of 14,422 jobs, annual earnings of \$721.8 million, and an overall economic activity of \$1.79 billion. Not shown in the table, but described later, are the combined state and local tax impacts from all these airports, which total \$141.1 million.

The 2022 direct and indirect impacts of aviation in Maine underscores the significance of our airports. They not only facilitate transportation and connectivity but are also powerful economic catalysts, creating thousands of jobs and pumping millions into our state treasury. As we appreciate these numbers, it's evident that supporting and nurturing our aviation infrastructure is not just about flights—it's about fueling Maine's prosperity.

**Table E-1 - 2022 Statewide Impacts of Aviation in Maine**

<i>LOC ID</i>	<i>Airport Name</i>	<i>Employment</i>	<i>Income</i>	<i>Output</i>
<b>Commercial Service Airports</b>				
AUG	Augusta State	101	\$6,002,300	\$14,005,600
BGR	Bangor International	2,808	\$141,333,700	\$341,980,000
BHB	Hancock County - Bar Harbor	123	\$6,789,100	\$18,166,700
RKD	Knox County Regional	243	\$13,325,200	\$41,118,600
PWM	Portland International Jetport	10,007	\$479,495,300	\$1,175,466,500
PQI	Presque Isle International	358	\$29,443,900	\$83,501,100
<b>General Aviation Airports</b>				
LEW	Auburn/Lewiston Municipal	101	\$5,506,600	\$16,282,900
BST	Belfast Municipal	11	\$526,500	\$1,711,200
0B1	Bethel Regional	16	\$789,400	\$1,484,100
B19	Biddeford Municipal	18	\$1,079,000	\$3,013,100
BXM	Brunswick Executive	149	\$8,411,300	\$21,722,500
CAR	Caribou Municipal	13	\$607,300	\$2,201,900
OWK	Central Maine Regional	6	\$281,900	\$713,700
44B	Charles A. Chase Jr. Memorial Field	2	\$49,900	\$120,100
OLD	Dewitt Field, Old Town Municipal	49	\$3,519,200	\$6,300,500
1B0	Dexter Regional	16	\$851,200	\$2,558,600
IZG	Eastern Slope Regional	7	\$330,400	\$998,400
EPM	Eastport Municipal	14	\$580,800	\$2,199,300
3B1	Greenville Municipal	6	\$180,100	\$560,100
HUL	Houlton International	16	\$793,300	\$2,484,900
57B	Islesboro	1	\$34,500	\$93,200
LRG	Lincoln Regional	29	\$1,812,600	\$5,311,900
MVM	Machias Valley Municipal	8	\$339,000	\$1,143,200
MLT	Millinocket Municipal	16	\$842,000	\$1,820,100
59B	Newton Field	15	\$871,900	\$2,614,300
FVE	Northern Aroostook Regional	9	\$446,500	\$1,469,800
81B	Oxford County Regional	26	\$1,266,400	\$2,598,900
2B7	Pittsfield Municipal	33	\$4,454,800	\$7,440,200
PNN	Princeton Municipal	13	\$543,200	\$1,915,600
SFM	Sanford Seacoast Regional	110	\$6,242,400	\$15,032,100
8B0	Stephen A. Bean Municipal	30	\$1,331,600	\$4,692,800
93B	Stonington Municipal	0	\$12,500	\$24,800
B21	Sugarloaf Regional	10	\$477,800	\$1,196,400
WVL	Waterville Robert LaFleur	49	\$2,711,600	\$6,593,600
IWI	Wiscasset	11	\$501,800	\$1,611,700
<b>Grand Totals</b>		<b>14,422</b>	<b>\$721,785,000</b>	<b>\$1,790,148,400</b>

This report is organized to include the following sections and topics:

- Introduction
- Study Methodology
- Survey of Maine Airports
- IMPLAN Analysis and Results
- Appendix A - Four Case Studies
- Appendix B - Tables w/Aggregated Results
- Appendix C - Airport IMPLAN Results







# 1. INTRODUCTION

The purpose of this study is to quantify the economic impact and contribution of airports in Maine to the state's economy. The outcomes of this analysis are presented in terms of jobs, income, taxes generated, and total economic output in dollars. Through the economic impact analysis of Maine's airports, stakeholders are provided with a clear understanding that their investments in local airports foster job creation and incomes while generating additional tax revenue for state and local governments.

Prior to presenting results of the analysis, it is helpful to define the technical terms used in this report:

- **Direct Spending:** This encompasses both on-airport and off-airport spending on employment, operations, and capital projects. The off-airport spending includes expenditures by air travelers on various services such as car rentals, hotels, and restaurants. As such, direct spending is associated with both the providers and users of airport services.
- **Induced Benefits:** These are impacts over and above the original direct spending created by the subsequent rounds of spending in the local economy until the original direct impact has been incrementally exported from the local area.
- **Jobs and Income:** These refer to the jobs and income generated by activity at airports in Maine.
- **Total Output in Dollars:** This represents the combined impacts of direct and induced spending.
- **Taxes:** This term refers to the tax revenue contribution of the Maine airports to local and state units of government in Maine. Also generated, but not shown, are federal tax revenues.

The economic activities at airports create far-reaching ripple effects that can be understood through two primary channels: (1) Interactions between businesses that occur due to transactions and collaborations, and (2) the cascading effects derived from the spending of income earned by employees within these firms. This earned income circulates and is spent repeatedly within the community, influencing various economic sectors.

In a large community with a diverse retail base, a new job at an airport might have a multiplier effect, often leading to the creation of an equivalent job elsewhere in the regional economy. For instance, when wages from airport jobs are spent on locally produced goods, the impact on indirect job creation is amplified.

In smaller communities, the multiplier effect may be more modest, with a new airport job generating between one-fifth to one-half of additional jobs in other sectors. Importantly, these ripple or multiplier effects can have both positive implications, as when an airport expands, and negative consequences, such as when a business closes or an airport reduces its workforce. In all cases, the connectivity between airports and the broader local economy underscores the vital role airports play in the overall economic health and growth of a region.

## 1.1 AIRPORTS STUDIED

In Maine, the focus of the study is a group of 35 public-use airports. The list includes airports of different sizes and capacities, including commercial service airports, reliever airports, and general aviation airports. The roles and National Plan of Integrated Airport Systems (NPIAS) categories of the 35 public-use airports under study include the following:

**Table 1 – Maine Airports Analyzed**

<i>AIRPORT ID</i>	<i>Airport Name</i>	<i>Associated City</i>	<i>NPIAS Category</i>	<i>NPIAS Role</i>
<b>Commercial Service Airports</b>				
BGR	Bangor International	Bangor	Primary	
PQI	Presque Isle International	Presque Isle	Primary	
PWM	Portland International Jetport	Portland	Primary	
RKD	Knox County Regional	Rockland	Primary	
AUG	Augusta State	Augusta	Commercial Service	Regional
BHB	Hancock County-Bar Harbor	Bar Harbor	Commercial Service	
<b>General Aviation Airports</b>				
LEW	Auburn/Lewiston Municipal	Auburn/Lewiston	Reliever	Regional
SFM	Sanford Seacoast Regional	Sanford	Reliever	Regional
BST	Belfast Municipal	Belfast	General Aviation	Basic
0B1	Bethel Regional	Bethel	General Aviation	Local
B19	Biddeford Municipal	Biddeford	General Aviation	Local
BXM	Brunswick Executive	Brunswick	General Aviation	Local
CAR	Caribou Municipal	Caribou	General Aviation	Basic
OWK	Central Maine Airport of Norridgewock	Norridgewock	General Aviation	Local
44B	Charles A Chase Jr Memorial Field	Dover/Foxcroft	General Aviation	Unclassified
OLD	Dewitt Field, Old Town Muni	Old Town	General Aviation	Local
1B0	Dexter Regional	Dexter	General Aviation	Local
IZG	Eastern Slope Regional	Fryeburg	General Aviation	Local
EPM	Eastport Municipal	Eastport	General Aviation	Basic
3B1	Greenville Municipal	Greenville	General Aviation	Local
HUL	Houlton International	Houlton	General Aviation	Local
57B	Islesboro	Islesboro	General Aviation	Unclassified

**Table 1 – Maine Airports Analyzed**

<i>AIRPORT ID</i>	<i>Airport Name</i>	<i>Associated City</i>	<i>NPIAS Category</i>	<i>NPIAS Role</i>
LRG	Lincoln Regional	Lincoln	General Aviation	Local
MVM	Machias Valley	Machias	General Aviation	Basic
MLT	Millinocket Muni	Millinocket	General Aviation	Local
59B	Newton Field	Jackman	General Aviation	Basic
FVE	Northern Aroostook Regional	Frenchville	General Aviation	Basic
81B	Oxford County Regional	Oxford	General Aviation	Basic
2B7	Pittsfield Municipal	Pittsfield	General Aviation	Local
PNN	Princeton Municipal	Princeton	General Aviation	Basic
8B0	Steven A Bean Municipal	Rangeley	General Aviation	Basic
93B	Stonington Municipal	Stonington	General Aviation	Unclassified
B21	Sugarloaf Regional	Carrabassett	General Aviation	Basic
WVL	Waterville Robert Lafleur	Waterville	General Aviation	Local
IWI	Wiscasset	Wiscasset	General Aviation	Local

The subsequent sections of this report examine the impacts these airports have on both Maine's economy and the livelihood of its residents.

## 1.2 INPUT FOR ECONOMIC IMPACT MODEL

Input was collected for the economic impact model using a variety of sources such as surveys, interviews, published data, and some on-site visits. There were three key input factors: (1) the number of jobs at the airport, (2) the average annual capital expenditures, and (3) annual visitor spending. The following summary details were then developed:

In addition, the study includes an in-depth analysis, developing four unique case studies that emphasize the varied economic impacts of different airport operations and services in Maine. These studies present a comprehensive view of the influence of various aviation services on the local and state economy.

- **Jobs:** It was estimated that direct on-airport business and employer employment totaled **3,137 full-time equivalent jobs** statewide (not including jobs associated with capital expenditures or capital spending at airports).
- **Average Annual Capital Expenditures:** Across the state, more than **\$65.6 million** in direct capital development was spent at all Maine airports in a single year.
- **Annual Visitor Spending:** Visitors using Maine's airports spent nearly **\$668.3 million** in the same year.



- **Deblois Air Strip and the Blueberry Industry:** A detailed examination of Deblois Air Strip's contribution to the local blueberry industry forms a significant part of the analysis. This case study brought to light the critical role of small airstrips in supporting agricultural industries, facilitating transport of goods, and encouraging local business growth.
- **Outdoor Recreation/Seaplane Operator(s):** Another case study focused on the economic influence of outdoor recreation and seaplane operators. The analysis showcased how these operators enrich the local economy, encourage tourism, and support related industries such as hospitality and guiding services.
- **Penobscot Island Air/Air Charter Operator:** An in-depth analysis of the impact of air charter services, using Penobscot Island Air as a case study, is included in the report. The study illustrated the crucial role of air charter services

in enhancing connectivity, promoting tourism, and bolstering local businesses.

- **LifeFlight/Emergency Medical Operator:** A final case study explored the economic impact of LifeFlight and other emergency medical operators in Maine. This analysis illuminated the indispensable service these operators provide in emergency medical scenarios, their contribution to the healthcare sector, and the benefits to the local economy via job creation and associated services.

Each case study offers a detailed understanding of the unique contributions made by various aviation services to Maine's economy. The analyses provide a rich perspective on the economic impact of airport activities and operations, going beyond general trends and figures to emphasize the significance of individual airport services.

## 1.3 ECONOMIC IMPACT METHODOLOGY

As described in more detail in Section 1.2, the approach used to estimate the total economic impacts for airports in Maine entailed inputting the direct impacts (expenditures for operations, capital outlays, and visitor spending) into an economic modeling system (IMPLAN) to calculate the induced effects of direct spending. By definition, induced economic impacts are the multiplied effects of the direct impacts. Using this modeling system, the study documents the number of jobs, income, and economic output created and sustained by each airport in Maine.

Technically, the study tracks the flow of expenditures through different economic sectors until the money is incrementally exported from the region via purchases of external goods and services. Therefore, the economic impacts of aviation can be felt in parts of Maine's economy that are quite distant from aviation. Regions that are more economically

self-sufficient have higher responding "multipliers" than do regions that are more dependent on regional imports since less of the money is drained out of the community for goods and services.



## 1.4 ECONOMIC IMPACT IMPORTANCE & RELEVANCE

Beyond statistical data and intricate financial jargon, the economic impact analysis carries considerable weight, resonating on a personal level and connecting individual experiences to broader economic possibilities. These impacts become clear when considering the connections created by airports and aviation services.

Tourism, a major pillar of Maine's economy, thrives thanks to the well-connected aviation network that allows visitors to easily explore the state's scenic beauty and rich culture. Airports provide vital gateways for tourists, which in turn spurs local economic activity as visitors dine, shop, and utilize accommodations across the state.

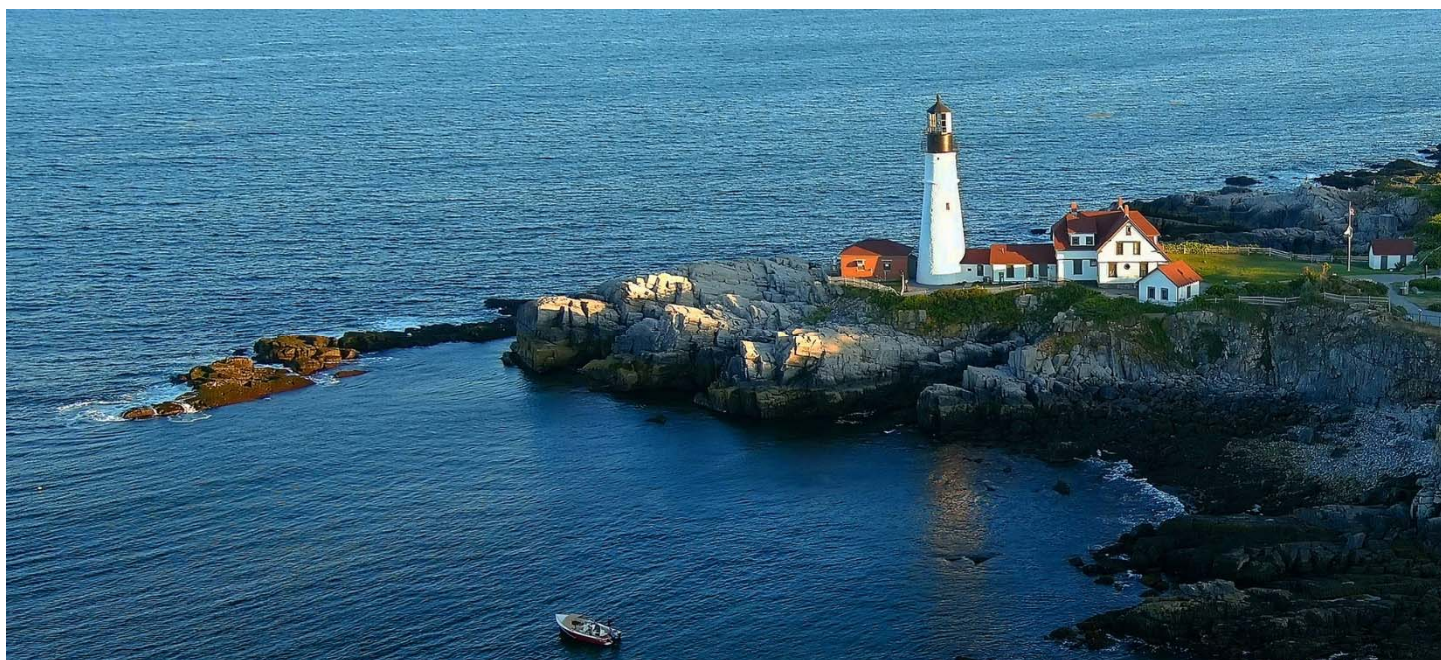
For the business community, airports provide indispensable commercial hubs, fostering economic growth by enabling efficient travel. This support bolsters local industries while encouraging economic innovation and expansion.

The influence of airports on Maine's economy also

reaches remote and rural areas, sustaining their viability. By facilitating essential transportation services, these airports prevent potential isolation, support local businesses, and ensure access to vital goods and services.

Perhaps most importantly, airports play a significant role in emergency medical operations. Services such as LifeFlight offer essential lifelines with on-site urgent care, allowing swift patient transport to hospitals in critical situations. This access to immediate medical care not only saves lives but also makes the remote areas of Maine a more inviting place to reside or visit.

In summary, the economic impact analysis illuminates the substantial benefits that arise from investments in airports. From travel experiences to business opportunities, healthcare services, and the interconnectedness of local communities, the results of this analysis show the economic benefits of aviation to the lives of Mainers.



# 2. STUDY

## METHODOLOGY

For this study, Input-Output (I-O) analysis was used to determine direct, induced, and total economic impacts for Maine airports. These impacts are measured in terms of jobs, income, and economic output. In addition, this modeling included the tax revenue impacts of aviation activity in Maine.

As an overview, I-O analysis is a method to capture the complex interdependencies between different sectors of an economy. In a typical I-O table, industries are both consumers and producers. They produce outputs that are consumed by other industries as inputs, and they use inputs from other industries to create their outputs.

This study used the IMPLAN modeling system to estimate the economic impacts of changes in an economy. IMPLAN extends the traditional I-O model by incorporating additional data and methodologies to allow for more detailed regional economic analysis. It includes:

**Sectors:** IMPLAN divides the economy into 546

different industry sectors, based on a universal classification system.

**Regional Focus:** Unlike some economic models, IMPLAN can be tailored to specific regions, capturing the local economic structure and inter-industry relationships.

**Multipliers:** IMPLAN calculates multipliers for output, employment, income, and value-added for each industry in a region. Multipliers represent the overall economic impact that a change in one industry will have throughout the economy.

IMPLAN is mostly used for economic impact studies, policy analyses, and supply chain analysis. As such, it can assess the economic effects of different policy choices, as well as investigate the impact of changes within a particular industry's supply chain. For this study, IMPLAN was used to generate multipliers of common economic metrics at airports – jobs, income, output, and tax revenues. Discussed below are the components and inputs of the analysis that deal with each of the impact measures.

## 2.1 DIRECT ECONOMIC IMPACT INPUTS

Direct impacts are associated with providers of services at an airport. They are immediate consequences of airport economic activity. The

cumulative value of direct impacts is the total of payroll, capital expenditures, operational and maintenance costs, taxes, and fees incurred by

service providers at an airport. Additionally, direct impacts include offsite economic activities linked to the airport, such as hotels, restaurants, rental cars, etc., that air travelers use.

The compilation of data inputs for direct impacts is essential for an accurate assessment of the comprehensive economic impacts of aviation. Hence, considerable time and effort were dedicated to surveying airports to gather information about their businesses and employers. Responses varied per airport, but overall, a significant amount of valuable data was obtained. A 100 percent response rate for the number of jobs on the airport was achieved. Some other data had to be sourced from published materials. For this study, the direct impact inputs included:

- 2022 Direct Employment
- Average Annual Capital Spending
- 2022 Estimated Direct Visitor Spending

## 2022 Direct Employment

Surveys were emailed to each Maine airport to interview airport managers to confirm estimates of 2022 on-airport employment. For the smaller airports, this was a relatively simple process. Airport managers were very familiar with the operators on their fields and could respond to the surveys. In some cases, they would have to contact some on-airport businesses to obtain updated numbers. For larger airports, the process was more complex. However, surveys were collected for all commercial service and general aviation airports (with some assistance from MaineDOT).

**Table 3** in Section 4.1, presented later, shows the 2022 direct full-time-equivalent employment at each airport, taken from survey data. In addition, jobs generated by capital spending and visitor expenditures are included in the Table, as described in the following sections.

## Average Annual Capital Spending

The IMPLAN model has the capability to estimate forward and backward – meaning that employment can be estimated from expenditure input, and vice versa. Therefore, an understanding of either input can yield a comprehensive output from economic multiplier modeling.

In Maine, the average annual amount of capital spending for each airport is available from published records of the State and FAA. However, these records are only for expenditures, but not the number of workers associated with each capital improvement project. Thus, the IMPLAN modeling used the direct impact of average annual capital improvement expenditures to derive employment numbers. A five-year history was collected, where available, for each airport and average spending was derived from that period. **Table 3**, mentioned above, shows the aggregated jobs numbers generated by these average expenditures along with the jobs generated by visitor spending and the employment survey results.

## 2022 Direct Visitor Spending

This study and hundreds of others funded by the FAA support the concept that off-airport air traveler visitor spending leads to job creation and economic impact. The FAA study, “The Economic Impact of Civil Aviation on the U.S. Economy – Economic Impact of Civil Aviation by State” published in January of 2020, states: “Among all sectors, however, airline visitor expenditures is clearly in the lead with primary output of \$358 billion, reflecting the scope and importance of air travel as a means of transport.”<sup>1</sup>

Visitors using airports spend money at local hotels, rental car agencies, restaurants, and other businesses. As can be imagined, a survey effort needed to track the expenditures of airport users in

<sup>1</sup> Source: The Economic Impact of Civil Aviation on the U.S. Economy: January 2020.  
[https://www.faa.gov/about/plans\\_reports/media/2020\\_jan\\_economic\\_impact\\_report.pdf](https://www.faa.gov/about/plans_reports/media/2020_jan_economic_impact_report.pdf) (accessed 3/30/2020).

Maine would require resources much greater than those available for this effort. Therefore, a surrogate measure of air visitor spending was developed that did not require surveys of arriving passengers. This method first estimated the number of visitors to an airport. Then, an estimated expenditure per visitor was applied to the total number of visitors, quantifying direct economic impacts. Using the IMPLAN model, these expenditures could be translated into jobs and added to the direct employment totals. This method was used for both airline and general aviation visitors.

### Commercial Airport Airline Visitors

The number of true visitors, times a per-trip spending level yielded an estimate of direct airline passenger visitor spending. In this regard, true visitors to airline airports are those who do not live in the airports' service area. Estimates of true visitor percentages were made for various sizes and types of airline airports in the State:

- Small & Non-Hub Airline Airport: 33 percent
- Portland International Jetport: 50 percent

To simplify the calculation, it was assumed that enplanements will equal deplanements over the long term. Thus, enplanements times the visitor percentages yielded the number of true visitors for the various commercial airports. A spending estimate, as described in a following section, was then multiplied by each airport's number of airline visitors.

### General Aviation Visitors

For many years, the Aircraft Owners and Pilots Association (AOPA) published a number - 2.5 pilots and passengers - as the average occupancy of itinerant general aviation aircraft. The FAA accepted this number, primarily because there were no definitive surveys showing different statistics. Recent checks of both the AOPA and FAA websites have shown these estimates are no longer

published. However, the estimates are reasonable, given the makeup of the general aviation fleet in Maine.



For this study it was assumed that only a small percentage of itinerant general aviation aircraft landings contain actual visitors. The following assumptions were made for the percentage of itinerant aircraft landings containing visitors:

- Privately-owned, public-use facilities: 2.5 percent
- Publicly-owned, general aviation airports in rural areas: 5.0 percent
- Publicly-owned general aviation airports in urban areas: 10.0 percent
- General Aviation activity at airline airports: 12.5 percent

Using this method, the number of general aviation visitors was estimated for each airport in Maine. As with the airline visitors, a spending estimate was applied to these totals and the resulting expenditures were used to estimate direct jobs.

### Visitor Spending Levels

Visitor spending levels were derived from information gathered from the Maine Office of Tourism shown in Table 2 for 2022. This information shows an average spending level of \$562.64. Because this is a per capita estimate, total spending



and total visitors can be higher or lower without necessarily contradicting the average spending level. For this study, the 2022 visitor spending number is

the best estimate available and was used in the analysis (except for Portland International Jetport, where actual survey data exists).

**Table 2 – Visitor Spending in 2022<sup>2</sup>**

SPENDING SECTOR	SPENDING AMOUNTS		PERCENT	AVERAGES
	2022			Average Cost Per Person
Visitation	15,363,600			\$562.64
<b>DIRECT TOURISM EXPENDITURES</b>				
	2022		Percent	
Restaurants	\$1,972,353,200		22.82%	\$128.38
Shopping	\$1,458,303,100		16.87%	\$94.92
Accommodations	\$2,145,627,000		24.82%	\$139.66
Transportation	\$934,373,400		10.81%	\$60.82
Groceries	\$767,326,300		8.88%	\$49.94
Activities, Attractions and Recreation	\$1,072,157,000		12.40%	\$69.79
Other	\$294,005,000		3.40%	\$19.14
<b>Total</b>	<b>\$8,644,145,000</b>		<b>100.00%</b>	<b>\$562.64</b>

Once these new estimates of visitor spending were applied to the number of estimated visitors, a total spending amount was developed for each airport. Those amounts were translated into direct job totals by the IMPLAN model.

As mentioned, the only exception to the use of this statewide visitor spending number involved Portland International Jetport. In this regard, actual survey data was available for PMW passengers from a previous economic impact study. Accounting for inflation, average visitor spending per trip was estimated at \$1,172 for Portland International Jetport.

## 2.2 INDUCED IMPACTS

Induced economic impacts are the multiplied effects of the direct impacts. These impacts are often separated into "indirect" and "induced" subcategories by some economists. Indirect impacts are those associated with the initial cycle of respending, while induced impacts include all other cycles of respending until the original amount is no longer in the region of study. However, for the purposes of this report, a simplification has been made by merging

the first and all subsequent spending rounds into one single induced category.

By tracing the spending impacts through all the various economic sectors via IMPLAN modeling, it can be shown that the economic impacts of aviation can be felt in parts of Maine's economy that are far removed from aviation. Regions that are more economically self-sufficient have higher respending multipliers than do regions that are more dependent

<sup>2</sup> 2022 Economic Impact & Visitor Tracking Report December 2021 – November 2022, (Maine Office of Tourism, <https://motpartners.com/wp-content/uploads/2023/03/Maine-Office-of-Tourism-2022-Visitor-Tracking-Report.pdf>)

on regional imports since less of the money is siphoned out of the community for goods and services.

## IMPLAN Model

IMPLAN, developed originally by the U.S. Forest Service, is a comprehensive impact system that is built on the framework of I-O and social accounting methodology. The database is maintained at the county level, allowing the creation of regions for study that are aggregations of counties. The database includes the latest business censuses supplemented by County Business Patterns and other data derived from the Bureau of Economic Analysis.

The I-O and social accounting models are derived from national data with adjustments made to reflect regional specialization, size, and industrial composition. The procedures used to accomplish this are well-known and accepted in the literature on nonsurvey techniques. Since IMPLAN provides a comprehensive system (i.e., the complete I-O table or social accounts), it is possible to trace impacts of change in one sector on other sectors in a detailed fashion. The IMPLAN software permits users to:

- Develop a complete set of social account matrices
- Develop user-specified multiplier tables
- Change any component of the system: production functions, trade flows, or database
- Create custom impact analyses by entering final demand changes
- Obtain any report in the system to examine the model's assumptions and calculations

In addition, the IMPLAN databases are composed of the following components:

- Employment;
- Industry Output;
- Value Added (Employee Compensation, Proprietary Income, Other Property Type Income, Indirect Business Taxes);

- Institutional Demands;
- Personal Consumption Expenditures (PCE) - three income levels;
- Federal Government Military and Non-Military Purchases;
- State and Local Government Education and Non-Education Purchases;
- Commodity Credit Corporation;
- Inventory Purchases;
- Capital Formation;
- Foreign Exports;
- Federal, State and Local Government Sales;
- Inventory Sales.
- National Structural Matrices (Use, Make, Inter-Institutional Transfers (SAM))

An advantage of the IMPLAN model is the data editing capability, allowing all underlying data, ranging from value added, employment, and final demands, to production functions, byproducts, regional purchase coefficients, and much more to be edited.



## Multiplier Example

The effects of induced economic impacts can be demonstrated through the following example. A new aviation company opens at a Maine airport, generating 100 new jobs, most of them filled by local residents. At the end of the year, the Maine

Department of Labor notes that employment has risen by 175 - yet only 100 new jobs were created. Why did an additional 75 jobs appear in the State? The process by which these jobs were created is known as the multiplier or ripple effect and is a result of several factors: the new firm making purchases of inputs from other firms in the region (thereby generating additional output and potentially employment) as well as the impacts of the expenditures of wages and salaries earned by the 100 new employees. IMPLAN provides an accounting system and associated model to trace the impacts of these new employees.

There are several additional multipliers that can be calculated. For example, when a sector expands production, it will increase payments to labor, generating additional wages and salaries that will be spent in the region. Further, other industries whose production has to expand to meet these new demands will also spend more on wages and salaries. Thus, an income multiplier may be generated that reveals the relationship between direct income generation and total income (in similar fashion to output). The analysis can also be transformed into employment terms. Referring back to the example above, it becomes clear why 175 jobs were created in total when only 100 direct jobs were created. The answer is the multiplier process.

Variations in multipliers across sectors and regions are to be expected. A small regional economy, with a modest representation of industry, may not be able to provide all the necessary inputs required by local industry. Thus, there will be considerable importation of inputs (sometimes referred to as leakages). Generally, the larger the value of the imports, the lower the value of the multiplier. As the economic region under consideration gets smaller, a decrease in the value of multipliers could be expected. This translates to progressively smaller multiplier values when moving from an individual state to a metropolitan region and finally to a county. However, exceptions may occur in regions where a particular sector has a significant representation.

## Tax Estimates

IMPLAN includes the estimation of tax impacts associated with expenditures. These important transactions include those between the government and consumers (taxes, transfers such as unemployment compensation, and welfare), between firms and government (such as business taxes) and between consumers and firms (dividends from stock ownership). These institutional transactions are captured in a social accounting matrix. With a social accounting system, the multipliers tend to be larger than those derived from the I-O system alone. The primary benefit of using an I-O model that includes a social accounting system is the quantification of taxes collected through the various transactions between sectors. In this regard, State and local taxes were estimated for each Maine airport studied in this analysis.

Information contained in the IMPLAN model for taxes includes direct, indirect, induced, and total impacts for the following areas:

- Sub-County General
- Sub-County Special Districts
- County
- State
- Federal
- Total

For this analysis, the most relevant tax information involves the summation of State, County, and Sub-County General and Special Districts. This is money going back into the local economy through government spending. Although the federal tax portion is significant, it is not as area-specific as State and local tax revenues. Thus, for each airport in Maine, the tax impact shown is a sum of all but the federal tax impacts.

# 3. SURVEY OF MAINE AIRPORTS

For airport-specific studies such as this, surveys are often the only way to access local data. In this regard, a survey with a cover letter was developed and emailed to all 35 system airports in Maine (Figures 1-3). The purpose of the survey was to gather information on airport jobs, visitors, and capital spending. The survey and the aggregate results are presented in the following sections.

## 3.1 SURVEY COVER LETTER

The survey cover letter was transmitted via email from the Director of Aviation, MaineDOT. In the letter, an explanation of the study's purpose and consulting team were introduced. In addition, the online survey link was provided. The Director made it clear that the most important information needed involved the number of jobs at each airport, by type. In this regard a 100 percent response rate was required to accurately assess each airport's economic impact. The letter also explained that the study team was looking to collect information on the number of annual visitors and average annual capital spending.

The survey was emailed on December 2, 2022, with a response requested within 30 days. While most of the airports were quick to respond, follow up efforts were needed until February 16, 2023, to collect the last response. In all, 35 surveys were returned and analyzed. The survey itself is described in the following sections.



Figure 1 – Airport Survey Cover Letter

## 3.2 AIRPORT ECONOMIC DATA SURVEY

The Airport Economic Data Survey, shown in **Figures 2 and 3**, consisted of two pages of questions along with adequate response space. Using the online response format (which was located at <https://meairportsurvey.com>), the number of pages could be expanded if additional airport businesses were listed.

The beginning questions were meant to identify the respondent and included the airport name and 3-letter FAA ID, the date, and specifics about the person filling out the survey.

For the Airport Economic Data, respondents were asked to provide information on airport employment, capital spending, and aircraft activity. These questions included:

- The number of jobs for 2022 for the Airport Sponsor and Management. These were further broken down into State, County, City, Authority, or Other categories. Instructions were given to assume 2 part-time jobs equaled one full-time job.
- The number of jobs associated with on-airport employers, including the type of business so that its IMPLAN economic sector could be correctly identified.
- In terms of capital spending, respondents were asked to provide the total capital spending for the past five years, including both grant and non-grant spending.
- For aircraft activity, respondents were asked to provide the estimated percentage of itinerant general aviation operations that are expected to be true transient (visitors) and the estimated number of general aviation visitors to the airport in 2022.

**Airport Economic Data Survey**  
 Maine Airport Economic Impact Analysis & Case Studies

MaineDOT requests your participation in this airport economic data survey. This information will be used as the basis for assessing the economic impacts of airports in Maine.

*Thank you! Your contributions to Maine's Economic Impact Analysis & Case Studies are sincerely appreciated!*

If you have questions about this survey or the Maine Airport Economic Impact Analysis & Case Studies, please contact Paul Wiedemann (paul@rawiedemann.com).

3-letter FAA ID:	Airport Name:	Date:
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**SURVEY COMPLETED BY**

<b>Organization Name:</b>	
Name:	Title/Position:
Telephone:	Email:

**AIRPORT ECONOMIC DATA**

**ON AIRPORT EMPLOYMENT – NUMBER OF JOBS:**

2022: Airport Sponsor Operation & Management Jobs – assume 2 part-time jobs = 1 full-time job (list all that apply):

State _____, County _____, City _____, Authority _____, Other _____	1. _____ Jobs: _____
2022: On-Airport Employers (Tenants with Employees):  Example: FedEx, Air Traffic Control Personnel, FBO, Corporate Aviation, Aircraft Maintenance, etc.  Please list type of business and their number of employees. Assume 2 part-time jobs = 1 full time job.  Please add more spaces for employers, if needed.	Type of Business: _____
	2. _____ Jobs: _____
	Type of Business: _____
	3. _____ Jobs: _____
	Type of Business: _____
4. _____ Jobs: _____	
Type of Business: _____	
5. _____ Jobs: _____	
Type of Business: _____	

Page 1

Figure 2 – Page 1 of Airport Survey

### 3.3 OTHER QUESTIONS

In addition to the economic impact questions, the survey included a set of questions aimed at measuring the level of activity for each function at the airports. Rather than give specific numbers, respondents were asked to provide general estimates of the relation to total annual activity including the following:

- No Activity
- Low
- Moderately Low
- Medium
- Moderately High
- High

There were quite a few areas of function that were included in the survey:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Aeromedical Flights</li> <li>• Law Enforcement/National Security Border Security</li> <li>• Emergency Response</li> <li>• Aerial Fire Fighting Support</li> <li>• Emergency Diversionary Airport</li> <li>• Disaster Relief and Search and Rescue</li> <li>• Critical Federal Functions</li> <li>• Remote Population/Island Access</li> <li>• Air Taxi/Charter Services</li> <li>• Essential Scheduled Air Service Cargo</li> <li>• Self-Piloted Business Flights</li> <li>• Corporate</li> <li>• Flight Instruction</li> <li>• Personal Flying</li> <li>• Charter Passenger Services</li> </ul> | <ul style="list-style-type: none"> <li>• Aircraft/Avionics Manufacturing/Maintenance</li> <li>• Aircraft Storage</li> <li>• Aerospace Engineering/Research</li> <li>• Agricultural Support</li> <li>• Aerial Surveying and Observation</li> <li>• Low-Orbit Space Launch and Landing</li> <li>• Oil and Mineral Exploration/Survey</li> <li>• Utility/Pipeline Control and Inspection</li> <li>• Business Executive Flight Service</li> <li>• Manufacturing and Distribution</li> <li>• Express Delivery Service</li> <li>• Air Cargo</li> <li>• Tourism and Access to Special Events</li> <li>• Intermodal Connections (rail/ship)</li> <li>• Special Aeronautical (skydiving/airshows)</li> </ul> |
|---|---|

In tabulating the results of this survey section, the activity levels were numbered from zero to five, with zero equating to “No Activity” and five assigned to “High” activity. In the aggregate, an average of these values can show the relative activity differences between airport functions at system airports.

### 3.4 SUMMARY RESULTS

As of July 26, 2023, all 35 airports had responded to the emailed survey. Information from the survey was

used to estimate the number of direct jobs, general aviation visitors, and capital spending.

**Airport Economic Data Survey**

6. \_\_\_\_\_ Jobs: \_\_\_\_\_  
Type of Business: \_\_\_\_\_

7. \_\_\_\_\_ Jobs: \_\_\_\_\_  
Type of Business: \_\_\_\_\_

8. \_\_\_\_\_ Jobs: \_\_\_\_\_  
Type of Business: \_\_\_\_\_

9. \_\_\_\_\_ Jobs: \_\_\_\_\_  
Type of Business: \_\_\_\_\_

10. \_\_\_\_\_ Jobs: \_\_\_\_\_  
Type of Business: \_\_\_\_\_

**OTHER AIRPORT DATA**

**AIRPORT CAPITAL SPENDING:**

Total Capital Spending – Last 5 years: \_\_\_\_\_  
All Grants: \$ \_\_\_\_\_  
Non-Grant Cap Spending: \$ \_\_\_\_\_ (if available)

**AIRCRAFT ACTIVITY:**

What % of 2022 Itinerant GA Aircraft Operations Are Estimated to be True Transient (Visitors)? \_\_\_\_\_ %

Please Estimate the number of general aviation Visitors to your airport in 2022. Rough Estimate: \_\_\_\_\_

**Thank you for your valuable input!**

Figure 3 – Page 2 of Airport Survey

## Direct Jobs

The number of jobs reported for each airport was taken from the survey and used to develop IMPLAN input for that facility. It is interesting that the top three airports in Maine support more than 84 percent of the direct airport-related jobs in the State. In rank order:

These were the job totals reported for the airports themselves, including airport sponsor employment, on-airport businesses, and government organizations. Not included in this direct number are the direct jobs associated with capital spending at the airports and visitor spending that occurs through each airport. Those spending numbers are addressed in the following sections.

**Table 3 – Direct Jobs in Rank Order**

Rank	Airport Name	Direct Jobs
1.	Bangor International Airport	1,291
2.	Portland International Jetport	1,188
3.	Presque Isle International Airport	161
4.	Brunswick Executive Airport	77
5.	Knox County Regional Airport	76
6.	Hancock County Bar Harbor Airport	60
7.	Sanford Seacoast Airport	60
8.	Augusta State Airport	49
9.	All Other Airports (27 Facilities)	175
<b>Total</b>		<b>3,137</b>



## Direct Capital Spending

In the survey, participants were asked about their airports' Total Capital Spending over the past five years. They could indicate the total grant amounts on one line and any non-grant capital spending on another line if that information was available. Non-grant spending could originate from private enterprises, such as hangar construction or similar investments on airport property. Consequently, direct capital spending reported by some airports encompassed both grant and non-grant funding sources. However, not all airports reported capital spending, with 16 out of 35 respondents (45.7 percent) leaving it unreported.

To comprehensively account for direct capital spending, published FAA five-year grant histories were examined for each non-responding airport. This analysis revealed an additional \$10.46 million per year in capital expenditures statewide. Apart from two airports with an average annual spending of \$1,000 or less, the average annual amounts varied among airports, ranging from a high of \$20.9 million to a low of \$127,200 per year. Including these figures was crucial for capturing the full extent of capital spending's impact on job creation, income generation, economic output, and tax revenue.

In total, the average direct capital spending for all 35 airports amounted to \$65.57 million, which included \$3.5 million reported as non-grant capital spending. These figures were incorporated into the IMPLAN model under the construction and capital maintenance economic sectors. Based on the survey data, there were a few observations about capital spending at Maine airports:

- **Disparity in Capital Spending:** As can be imagined, the scale, scope, and requirements of airport projects in Maine vary, depending on factors such as airport size, location, and type (commercial or general aviation).
- **Importance of Grant Funding:** Grant funding plays a vital role in supporting capital spending at airports. This highlights the significance of federal and state grants in facilitating airport

development and infrastructure improvements. Only 5 percent of total reported funding was from non-grant sources. It is likely that non-grant capital investment is much higher, but simply not recorded by airport management.

- **Commercial Service Airports' Dominance:** As expected, commercial service airports tend to have higher capital spending than general aviation airports, because they have more extensive infrastructure requirements. For example, Portland International Jetport accounts for almost one-third of the total.

## Visitor Spending

The Maine surveys did not ask questions about visitor spending, because the State has already compiled data on this topic over a much broader survey population and demographic. As mentioned in the Methodology section, average visitor spending per trip was estimated at \$1,172 for Portland International Jetport and \$563 at the other 34 airports.



It turns out that visitor spending is the largest component of direct aviation impacts to the Maine economy – 10 times larger than the average annual capital spending at airports. This underscores the importance of airports to the tourist industry in Maine. It also suggests the economic need for aviation in reaching tourist destinations that may be remote or inaccessible by car.



# 4. IMPLAN ANALYSIS AND RESULTS

To estimate total economic impacts, the IMPLAN model was used to analyze inputs from each Maine airport. In this study, the direct impacts, which include airport jobs, annual visitor spending, and capital spending, were collected and entered into the model. Each direct impact was then assigned a specific sector code within the IMPLAN system, allowing it to be categorized within the broader economic framework. IMPLAN then estimated the indirect and induced impacts. Indirect impacts refer to the inter-industry transactions that occur as a result of the direct activities, while induced impacts are the broader effects on household income and consumer spending within the community. As

mentioned previously in Section 2.2, the indirect and induced impacts have been combined into a single category called "induced" in this report.

Finally, the direct and induced totals were added together, generating a comprehensive overview of the overall economic effects. The results were then aggregated in a final table, showing all three sets of impacts for each airport. This approach helped in understanding not only the immediate economic contributions of the airports but also the ripple effects that permeate various sectors of the local and regional economy.

## 4.1 IMPLAN INPUTS

**Table 3** presents a listing of the direct inputs to the IMPLAN model by airport. The three critical aspects of their economic contribution included the number of airport jobs, annual visitor spending, and annual capital spending.

- **Airport Jobs:** This column indicates the employment opportunities created by each airport. The data reveals significant variation in employment levels. Bangor International (BGR) and Portland International Jetport (PWM)

emerge as significant employers, providing 1,291 and 1,188 jobs, respectively. It should be noted that Bangor's numbers included 490 FTE military personnel. On the other end of the spectrum, some smaller regional and municipal airports, such as Belfast Municipal (BST) and Stonington Municipal (93B), provide employment to fewer than 5 individuals.

- **Annual Visitor Spending:** This metric represents the money spent by visitors using these airports. Again, there is a substantial

difference across the airports. Portland International Jetport (PWM) dominated the spending category, with visitors spending over \$582 million annually. In contrast, smaller airports like Charles A. Chase Jr. Memorial Field (44B) and Stephen A. Bean Municipal (8B0) had annual visitor spending in the tens of thousands of dollars.

- Annual Capital Spending:** This column represents investments made in infrastructure and other capital expenses. Some airports, such as Portland International Jetport (PWM), demonstrate robust capital development with spending exceeding \$20 million, while some others reported little or no capital spending.

The collective data shows the significant variations between Maine’s airports, reflected by the

differences in size, function, and strategic focus. Larger international and regional airports contribute extensively to job creation and drive substantial visitor spending, acting as vital hubs for economic activity. Meanwhile, smaller municipal and regional airports, though contributing less in absolute terms, still play crucial roles in local connectivity and economic viability, particularly in more remote areas. These variations underscored the importance of understanding the unique context and role of each airport when considering investment and development strategies.

Overall, the IMPLAN input data summarized the aviation sector as one that provides roughly 3,300 direct airport jobs, and more than \$733 million in direct annual capital and visitor spending across the state. These spending levels created significant additional numbers of direct and induced jobs.

**Table 4 – IMPLAN Inputs by Airport**

LOC ID	Airport Name	Airport Jobs	Annual Visitor Spending	Annual Capital Spending
<b>Commercial Service Airports</b>				
AUG	Augusta State	49	\$1,804,390	\$644,366
BGR	Bangor International	1,291	\$67,064,048	\$5,980,000
BHB	Hancock County - Bar Harbor	60	\$2,529,679	\$1,264,173
RKD	Knox County Regional	76	\$4,892,419	\$4,180,000
PWM	Portland International Jetport	1,188	\$582,952,528	\$20,900,000
PQI	Presque Isle International	161	\$2,484,210	\$3,877,754
<b>General Aviation Airports</b>				
LEW	Auburn/Lewiston Municipal	34	\$2,102,867	\$2,760,000
BST	Belfast Municipal	1	\$84,396	\$1,031,379
OB1	Bethel Regional	11	\$70,330	\$127,247
B19	Biddeford Municipal	1.5	\$182,858	\$1,410,574
BXM	Brunswick Executive	77	\$703,300	\$2,752,935
CAR	Caribou Municipal	1	\$42,198	\$1,354,130
OWK	Central Maine Regional	2	\$101,979	\$271,587
44B	Charles A. Chase Jr. Memorial Field	1	\$24,616	\$1,022
OLD	Dewitt Field, Old Town Municipal	24	\$843,960	\$180,357
1B0	Dexter Regional	2	\$70,330	\$1,269,623
IZG	Eastern Slope Regional	1	\$130,111	\$558,241
EPM	Eastport Municipal	1	\$63,297	\$1,544,889

**Table 4 – IMPLAN Inputs by Airport**

LOC ID	Airport Name	Airport Jobs	Annual Visitor Spending	Annual Capital Spending
3B1	Greenville Municipal	1	\$210,990	\$169,143
HUL	Houlton International	2	\$175,825	\$1,251,053
57B	Islesboro	1	\$75,956	\$1,000
LRG	Lincoln Regional	13	\$18,286	\$867,426
MVM	Machias Valley Municipal	1	\$21,099	\$749,137
MLT	Millinocket Municipal	8	\$98,462	\$311,982
59B	Newton Field	1	\$35,165	\$1,724,755
FVE	Northern Aroostook Regional	1	\$16,422	\$845,056
81B	Oxford County Regional	17	\$106,550	\$350,000
2B7	Pittsfield Municipal	13	\$179,342	\$367,570
PNN	Princeton Municipal	1	\$45,011	\$1,290,250
SFM	Sanford Seacoast Regional	60	\$607,511	\$1,306,440
8B0	Stephen A. Bean Municipal	3	\$43,956	\$2,855,470
93B	Stonington Municipal	0.25	\$14,066	\$0
B21	Sugarloaf Regional	13	\$87,913	\$253,731
WVL	Waterville Robert LaFleur	19	\$281,320	\$2,182,000
IWI	Wiscasset	1	\$118,682	\$937,851
<b>Total</b>		<b>3,136.8</b>	<b>\$668,284,068</b>	<b>\$65,571,141</b>

*Airport Jobs and Capital Spending Source: Airport Manager Surveys, 2022*

*Visitor Spending Source: Estimated from State Tourism Data and Surveys*

## 4.2 IMPLAN ANALYSIS RESULTS

As illustrated in Table 4, the IMPLAN analysis results showcased a detailed breakdown of the economic impact of Maine's airports, from Augusta State to Wiscasset. These results provide insights into both direct and induced effects, reflecting the essential role the state's airports play in bolstering the economy.



Key highlights from a statewide perspective include:

- **Total Employment:** Across all airports, Maine benefited from 14,422 total jobs, comprised of 10,112 direct and 4,309 induced jobs.
- **Total Income:** The airports contributed \$721,785,000 in total income, comprised of \$475,744,200 in direct income and \$246,040,800 in induced income.
- **Total Output:** Together, the airports generated a total output of \$1,790,148,400, including \$1,052,385,900 in direct output and \$737,762,500 in induced output.

Among the individual airports:

- **Portland International Jetport** led with the highest figures, providing 10,007 total jobs and contributing over \$1.17 billion in total output.
- **Bangor International** followed as another major contributor, with a total of 2,808 jobs and more than \$341.9 million in total output.
- **Smaller Commercial Service Airports**, such as **Hancock County - Bar Harbor** and **Knox County Regional**, also made substantial contributions, adding millions to the state's economy.
- **General Aviation Airports:** The combined economic impact of Maine's general aviation airports underscored their essential role in the state's economy. These airports collectively supported 782 jobs, contributed \$45,395,500 in incomes, and generated \$115,909,900 in total

output. While these airports do not handle commercial passenger traffic, their importance is felt across many economic sectors, including private transportation, logistics, tourism, and regional development. They act as key connectors for businesses, individuals, and communities, strengthening the statewide economic infrastructure.

The analysis suggests that Maine's airports are more than mere transportation centers. They are significant economic engines, with ripple effects that extend across hundreds of sectors in the local economy. Whether through direct job provision or induced effects on spending, these airports significantly enhance the economic vitality of the State.



**Table 5 – IMPLAN Analysis Results: Direct, Induced, and Total Impacts**

Airport Name	Direct Employment	Induced Employment	Total Employment	Direct Income	Induced Income	Total Income	Direct Output	Induced Output	Total Output
<b>Commercial Service Airports</b>									
Augusta State	70	31	101	\$4,386,100	\$1,616,200	\$6,002,300	\$9,101,000	\$4,904,600	\$14,005,600
Bangor International	2,024	784	2,808	\$101,393,500	\$39,940,200	\$141,333,700	\$216,253,500	\$125,726,500	\$341,980,000
Hancock County - Bar Harbor	90	33	123	\$5,218,700	\$1,570,400	\$6,789,100	\$12,991,400	\$5,175,300	\$18,166,700
Knox County Regional	147	96	243	\$8,815,500	\$4,509,700	\$13,325,200	\$27,130,500	\$13,988,100	\$41,118,600
Portland International Jetport	7,042	2,965	10,007	\$301,845,500	\$177,649,800	\$479,495,300	\$654,793,600	\$520,672,900	\$1,175,466,500
Presque Isle International	210	148	358	\$22,293,200	\$7,150,700	\$29,443,900	\$59,064,900	\$24,436,200	\$83,501,100
<b>General Aviation Airports</b>									
Auburn/Lewiston Municipal	70	31	101	\$3,795,000	\$1,711,600	\$5,506,600	\$10,879,700	\$5,403,200	\$16,282,900
Belfast Municipal	8	3	11	\$374,900	\$151,600	\$526,500	\$1,181,600	\$529,600	\$1,711,200
Bethel Regional	12	3	16	\$655,700	\$133,700	\$789,400	\$1,031,300	\$452,800	\$1,484,100
Biddeford Municipal	11	7	18	\$643,400	\$435,600	\$1,079,000	\$1,687,800	\$1,325,300	\$3,013,100
Brunswick Executive	98	51	149	\$5,323,600	\$3,087,700	\$8,411,300	\$12,795,200	\$8,927,300	\$21,722,500
Caribou Municipal	8	5	13	\$375,200	\$232,100	\$607,300	\$1,388,600	\$813,300	\$2,201,900
Central Maine Regional	4	1	6	\$221,800	\$60,100	\$281,900	\$503,800	\$209,900	\$713,700
C. A. Chase Jr. Memorial Field	1	0	2	\$39,700	\$10,200	\$49,900	\$83,300	\$36,800	\$120,100
Dewitt Field, Old Town Mun.	34	15	49	\$2,761,000	\$758,200	\$3,519,200	\$3,904,900	\$2,395,600	\$6,300,500
Dexter Regional	10	6	16	\$529,600	\$321,600	\$851,200	\$1,483,800	\$1,074,800	\$2,558,600
Eastern Slope Regional	6	2	7	\$256,000	\$74,400	\$330,400	\$734,100	\$264,300	\$998,400
Eastport Municipal	10	4	14	\$416,800	\$164,000	\$580,800	\$1,596,600	\$602,700	\$2,199,300
Greenville Municipal	5	1	6	\$139,600	\$40,500	\$180,100	\$403,600	\$156,500	\$560,100
Houlton International	11	5	16	\$530,500	\$262,800	\$793,300	\$1,564,600	\$920,300	\$2,484,900
Islesboro	1	0	1	\$26,100	\$8,400	\$34,500	\$63,000	\$30,200	\$93,200
Lincoln Regional	18	11	29	\$1,238,400	\$574,200	\$1,812,600	\$3,488,000	\$1,823,900	\$5,311,900
Machias Valley Municipal	6	2	8	\$253,900	\$85,100	\$339,000	\$829,100	\$314,100	\$1,143,200

**Table 5 – IMPLAN Analysis Results: Direct, Induced, and Total Impacts**

Airport Name	Direct Employment	Induced Employment	Total Employment	Direct Income	Induced Income	Total Income	Direct Output	Induced Output	Total Output
Millinocket Municipal	11	5	16	\$583,700	\$258,300	\$842,000	\$1,022,900	\$797,200	\$1,820,100
Newton Field	11	5	15	\$639,800	\$232,100	\$871,900	\$1,821,600	\$792,700	\$2,614,300
Northern Aroostook Regional	6	3	9	\$292,600	\$153,900	\$446,500	\$929,700	\$540,100	\$1,469,800
Oxford County Regional	20	5	26	\$1,022,200	\$244,200	\$1,266,400	\$1,782,200	\$816,700	\$2,598,900
Pittsfield Municipal	17	16	33	\$3,701,700	\$753,100	\$4,454,800	\$4,969,300	\$2,470,900	\$7,440,200
Princeton Municipal	9	4	13	\$400,400	\$142,800	\$543,200	\$1,389,900	\$525,700	\$1,915,600
Sanford Seacoast Regional	73	37	110	\$3,992,900	\$2,249,500	\$6,242,400	\$8,339,200	\$6,692,900	\$15,032,100
Stephen A. Bean Municipal	21	10	30	\$923,700	\$407,900	\$1,331,600	\$3,180,500	\$1,512,300	\$4,692,800
Stonington Municipal	0	0	0	\$10,200	\$2,300	\$12,500	\$16,900	\$7,900	\$24,800
Sugarloaf Regional	7	3	10	\$367,700	\$110,100	\$477,800	\$780,500	\$415,900	\$1,196,400
Waterville Robert LaFleur	34	15	49	\$1,911,300	\$800,300	\$2,711,600	\$4,086,500	\$2,507,100	\$6,593,600
Wiscasset	8	3	11	\$364,300	\$137,500	\$501,800	\$1,112,800	\$498,900	\$1,611,700
<b>Statewide Totals</b>	<b>10,112</b>	<b>4,309</b>	<b>14,422</b>	<b>475,744,200</b>	<b>246,040,800</b>	<b>721,785,000</b>	<b>1,052,385,900</b>	<b>737,762,500</b>	<b>1,790,148,400</b>

APPENDIX A

# Four Case Studies





Annual Economic Impact

# CHERRYFIELD FOODS

Deblois Flight Strip (43B)



**316 JOBS**

Total Employment Impacts



**\$12.7 MILLION**

Total Income Impacts



**\$32.0 MILLION**

Total Dollar Impacts



**\$1.97 MILLION**

State and Local Taxes





# DEBLOIS FLIGHT STRIP

The geographic location of Maine as the most northeasterly state among the Lower 48, presents a unique advantage for air transportation and commerce. Maine shares a 611-mile border with the Canadian provinces of Quebec and New Brunswick. Bangor International's (BGR) location along major flight paths makes it a convenient refueling stop for long-haul flights. Although there are no regularly scheduled direct international passenger flights currently at BGR, Bangor offers 24-hour access to U.S. Customs and Border Protection and serves as a critical entry and exit point for transatlantic flights, whether commercial, private, or air cargo operations. Hancock County Bar Harbor (BHB) also offers scheduled air service, albeit on a smaller scale via Cape Air to Boston connecting with jetBlue and 90+ domestic and international destinations. The important roles these National Plan of Integrated Airport Systems (NPIAS) airports play provides synergies for the interaction with smaller but essential facilities in preserving and increasing economic growth within the region.

One such facility is Deblois Flight Strip. Tucked away Downeast in a rural area along State Highway 193, equidistant between the towns of Cherryfield and Beddington lies an unassuming ribbon of asphalt 4,500 feet x 75 feet. The pavement is positioned about a quarter mile west of the main road and goes virtually unnoticed to all but blueberry harvesters and local youth who utilize it as a readymade drag strip and a gathering place with friends on weekends. Built in 1942, Deblois Air Strip served as an emergency landing airfield for military aircraft on training flights of the United States Army Air Forces. The field was closed after World War II and turned over for local government use. Currently owned by the State of Maine, this non-NPIAS airfield – although not supported through FAA funding – does play a supporting role to other NIPAS airports such as Bangor International, Hancock County-Bar Harbor, and Machias Valley Airport.



In 2020, the unmanned Flight Strip reported just 100 general aviation aircraft operations. This number is low considering the Bangor flight school uses the GPS approach to Deblois for training purposes. In addition, LifeFlight Maine utilizes the Flight Strip for operations training and the Air National Guard also conducts training operations at the Flight Strip. Most of these operations go unnoticed and unreported.

The Flight Strip's economic significance is its location in the middle of tens of thousands of acres of wild blueberry growing operations across the region. Cherryfield Foods – the single largest producer of wild blueberries in Maine – utilizes the Flight Strip during the growing and harvesting seasons. They consider the Flight Strip a valued asset that enhances the efficiency of their operations.

## **THE LARGEST PRODUCER OF WILD BLUEBERRIES IN NORTH AMERICA**

Maine produces 90 percent of all low-bush blueberries in North America. Cherryfield Foods grows and purchases approximately 34 million pounds of wild blueberries in Maine annually. This represents 41 percent of the total crop statewide and about 37 percent of all production in North America.

Cherryfield Foods is the United States division of farming and processing for Canadian-based Oxford Food Group. As the largest wild blueberry processing company in the world, Oxford Food Group owns around 47,000 acres of land in the State of Maine. Of this total, about 11,000 acres are dedicated to growing wild blueberries, with another 1,200 acres currently in development. The company also purchases fruit from approximately 30 independent landowners and provides a variety of farming services. The average field price paid to farmers for wild blueberries over the past five (5) years is 55 cents per pound. A small family growing operation of 100 acres, averaging 6,000 to 8,000 pounds per acre (in an alternating year harvest rotation) could gross \$165,000 to \$220,000 per year for these independent growers. Even after deducting expenses, this represents an important source of revenue for many Maine families. As our economic impact analysis shows, this revenue circulates into local communities, benefiting many.

# Economic Impacts of Blueberry Production

IMPLAN, an economic impact modeling program, was used to estimate the economic impact of the Cherryfield Foods annual blueberry production by analyzing its direct and indirect effects. Indirect effects include the purchase of labor, inputs, and services required to produce the crop, as well as the induced effects of increased consumer spending due to the increases in income for employees of the blueberry farm. The direct effects include the value of the crop itself, as well as any revenue generated from the sale of by-products from the crop. Of course, the convenience of Deblois Flight Strip contributes to the convenience and efficiencies of Cherryfield's corporate flight department.

During peak season, Cherryfield Foods employs approximately 220 personnel in Maine, with a year-round full time equivalent employment of 106. These employees are primarily based in the towns of Cherryfield and Machias where the group operates two factories and storage facilities. The factory positions support sales of fruit and products both internationally and domestically to most States in the USA. The annual economic impact of this one company's blueberry operations in the Region annually contributes to:

- **316 Jobs in Maine**
- **30 Independent Maine Farms**
- **\$12.7 Million in Incomes for Maine Residents**
- **\$32.0 million in Total Output**
- **\$1.97 million in State and Local Taxes Annually**



# Beyond AGRICULTURE

A significant portion of the lands owned by the Oxford Food Group in Maine are destined to become the home of a new \$270 million wind energy development.

Apex Clean Energy is developing Downeast Wind, a wind energy project located on the Oxford Food Group's lands in Washington County. Downeast Wind will have 126 megawatts (MW) of capacity from a 30-turbine wind farm in and near the town of Columbia, about nine miles southeast from Deblois Flight Strip. It is expected to generate enough homegrown Maine clean energy to power more than 38,000 homes per year. Work has already begun on the sites with the wind farm going online in late 2023 or early 2024. The company has said it

expects to create six permanent jobs, as well as 164 temporary jobs during construction. While Apex is headquartered in Virginia, the local Downeast Wind development team includes Portland-based engineering company Stantec; Sewell Engineering, of Old Town; TJDA landscape architects, of Yarmouth; Portland law firm Verrill; Bodwell Enviroacoustics, of Brunswick; and energy development firm Flycatcher, of Brunswick.

(<https://www.downeastwindfarm.com/> <https://www.mainebiz.biz/article/270m-washington-county-wind-project-on-track-for-2021-groundbreaking> )

Downeast Wind is projected to generate nearly \$20 million in community benefits for Columbia and Washington County that break down as follows:

- \$7.5 million in community benefit money dedicated to education, economic development, infrastructure, and public safety.
- \$8.2 million in TIF revenue including \$5 million for roads, bridges and other infrastructure, as well as \$600,000 for public safety.
- \$4 million in flexible community benefit money for property tax relief, infrastructure, and education.

Some \$85 million of Downeast Wind's \$270 million investment will be a direct investment in Washington County in the form of construction costs, infrastructure improvements and landowner payments.

## To Infinity and Beyond

The Maine Spaceport Initiative is seeking to secure the state's position in the new Space Economy. The state's unique geographic northeasterly position in the U.S. provides an ideal launch trajectory for polar orbits of small satellites, as well as an advantageous site for ground station development. The state's proposed vertical launch, horizontal launch, and Center for Innovation and Excellence complexes comprise the core of the proposed Spaceport Complex, which is currently in the strategic planning phase. A number of sites are being considered in Washington County.

It is projected that such development could contribute \$500 million to \$2.5 billion per year to the state's GDP by 2040 and provide between 3,400 and 6,700 good paying jobs per year by 2040. The Maine Space Grant Consortium commissioned from USM's Center for Business and Economic Research projects this activity would also generate significant tax revenues statewide. With its position roughly 12 miles from the coast and equidistant between airports in Bar Harbor and Machias, it is conceivable that the presence of Deblois Flight Strip could play a small role in supporting a Spaceport site in the area.

# Relationship with other **NPIAS AIRPORTS**

In its own way, Deblois Flight Strip currently fills a geographic facility gap in the region albeit with certain limitations. The Flight Strip's limited length (4,500 feet) lack of lighting, and lack of all-weather/around-the-clock accessibility makes it occasionally necessary for Cherryfield Foods' flight crews to reroute operations to other airports in the region.

Machias Airport is closest but does not provide a runway long enough to permit the aircraft to operate without significant weight penalties and ideal weather conditions. Bangor International Airport (BGR) is 52 road miles and an hour and fifteen-minute drive west; and Hancock County/Bar Harbor Airport (BHB) is 43 road miles and just over an hour drive southwest. Both airports are superior in terms of infrastructure and amenities. They simply are not as convenient geographically with longer ground travel times to the heart of Cherryfield Foods' area of activity.



# Airport Role

The small airports like Deblois Flight Strip play a number of significant roles beyond the basic aircraft take-off and landing functions most people usually consider. The following are just some of the less known but important uses for these facilities:

1. **Emergency Services:** Small airports often serve as bases for emergency services, such as air ambulances and search and rescue operations. They are essential for rapid response times in critical situations, particularly in remote areas.
2. **Firefighting:** Landing strips can serve as staging areas for aerial firefighting operations. Aircraft can be loaded with water or fire retardant and then be quickly deployed to nearby wildfires.
3. **Law Enforcement:** Law enforcement agencies sometimes use small airports for operations such as surveillance, traffic management, or rapid response to incidents. They can also be used for training exercises.
4. **Wildlife Management:** In some cases, airports serve as a base for wildlife management activities. They can be used for launching missions to track animals, distribute food during harsh winters, or for veterinary services in the case of animal diseases.
5. **Training:** They are often used as training facilities for new pilots or other aviation professionals. The lower traffic volumes and slower pace can provide a safer, less stressful learning environment.
6. **Economic Development:** Small airports can also spur local economic development by attracting businesses that benefit from quick, direct access to air transport. They can also be a draw for tourism, particularly in remote or scenic areas.
7. **Recreational Use:** These facilities can also serve recreational pilots and provide space for hobbyists to fly, for flight schools, and for special events.
8. **Environmental Monitoring and Research:** Airports can also serve as bases for environmental research or monitoring flights, such as those used to collect data on forest fires, monitor pollution levels, or track weather patterns.

Each of these roles contributes to the importance and value of small airports in general, underscoring the importance of their maintenance and development.





## Public Private PARTNERSHIP

In 2006, the Oxford Food Group invested its own funds, in collaboration with the Maine Department of Transportation, to extend the runway at Deblois.

Between 2014 and 2017 the company's flight department worked with the FAA to develop an instrument flight approach – "43B GPS approach" – into the Deblois Flight Strip. This is a significant advantage for all of the flying public who utilize this airfield to access the area where the current NPIAS system does not provide service. Many small airfields only have Visual Flight Rules which significantly restrict their operations during inclement weather. As previously mentioned, the Bangor Flight School, LifeFlight, and Air National Guard all use the GPS approach to Deblois for training purposes.

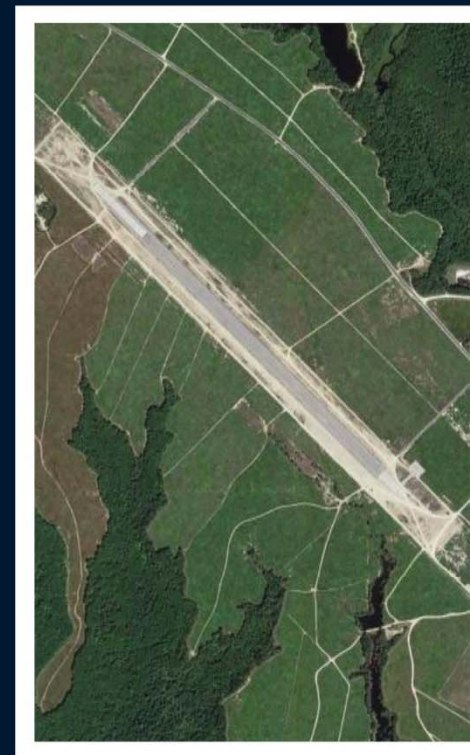
LifeFlight has expressed the enhanced capabilities and safety that could be gained with the addition of runway lights. The continuation and improvement of Deblois Flight Strip could be an important strategic move, leveraging public investments to stimulate private investments and create a safer, more efficient airport system.



## CURRENT ISSUES

Unfortunately, after investing in extending the runway at Deblois, pilots have recently been forced to reroute due to safety concerns – during otherwise ideal conditions. The primary concern is the accumulation of foreign object debris (FOD) as the result of the degradation of the asphalt surface by unauthorized local ground vehicles. This unsanctioned use by local vehicles on the runway has also resulted in heightened risks for an aircraft/automobile interaction.

The Deblois Flight Strip has no terminal, hangars, or other buildings. It is simply a runway with a small parking apron on the east side of the south end. There is no wildlife exclusion/security fence protecting active flight areas. Thus, the risk of potential wildlife hazards is elevated. The lack of security on site is a contributing issue. This highlights the need for a security fence along with periodic maintenance such as removal of Foreign Object Debris (FOD) and resurfacing of the runway. A possible solution would involve further public private partnering between Oxford Food Group, the State of Maine, with local government and law enforcement adding the Flight Strip to routine patrol routes.





## AN UNDERAPPRECIATED RESOURCE

The results of this study show that even small non-NPIAS general aviation airports provide a variety of benefits to the communities they serve. Deblois Flight Strip contributes to the local economy by helping support jobs, attracting business and investment, and supporting tax generation. Deblois is also available for disaster relief and as a base for emergency services such as search and rescue operations, and other emergencies. Of less note are the recreational opportunities GA airports provide for recreational flying, sightseeing, and tourism.

It is clear that the small airports of Maine – as seemingly insignificant as the Deblois Flight Strip – are valuable economic contributors within the regions they serve and should be maintained and protected to ensure their role and function well into the future.





## **Maine Economic Impact**

[www.maine.gov/mdot/aviation](http://www.maine.gov/mdot/aviation)

### **MaineDOT**

16 Statehouse Station

Augusta, ME 04333

Ph: 207-624-3000



Annual Economic Impact

# LIFEFLIGHT OF MAINE

Sanford Seacoast Regional Airport (SFM)

Auburn-Lewiston Municipal Airport (LEW)

Bangor International Airport (BGR)



**270 JOBS**

Total Employment



**\$36.2 MILLION**

Total Dollar Impacts



**\$15.8 MILLION**

Total Income Impacts



**\$1.19 MILLION**

State and Local



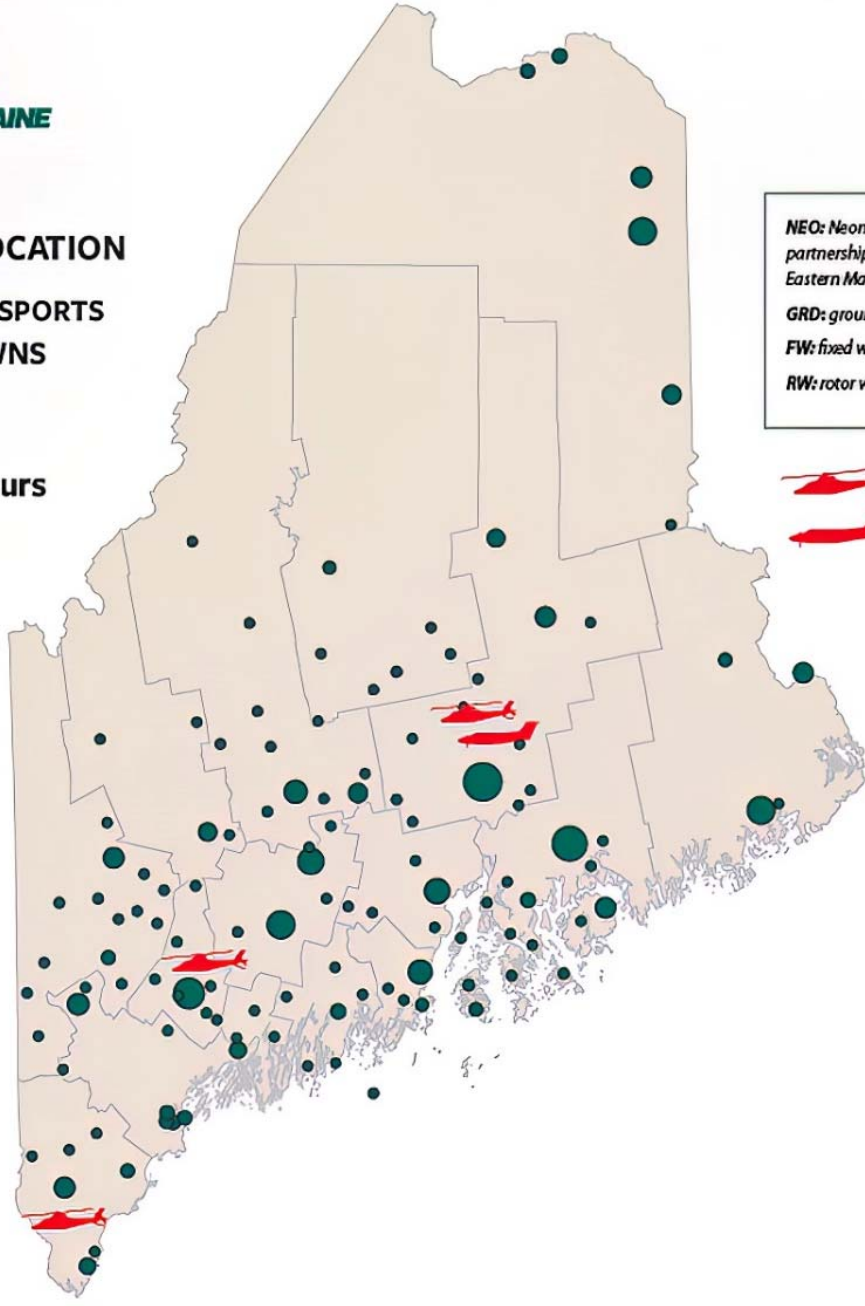
# FY 2021 TRANSPORTS BY LOCATION

**2,303** TOTAL TRANSPORTS  
**136** MAINE TOWNS

**1** transport  
every **4** hours

**NEO:** Neonatal transports in partnership with Northern Light Eastern Maine Medical Center NICU team  
**GRD:** ground transports  
**FW:** fixed wing (airplane) transports  
**RW:** rotor wing (helicopter) transports

 Helicopter Base  
 Airplane Base



Plus 83 transports from 18 towns in New Hampshire, Vermont, and Massachusetts

# LIFEFLIGHT OF MAINE

LifeFlight of Maine is one of the most efficient providers of aerial emergency medical transport in the nation. LifeFlight features a small administrative team and some of the lowest charges in the country. The service is co-owned by Northern Light Health and Central Maine Health Care.

LifeFlight currently employs 117 personnel including: 26 nurses, 26 paramedics, and an aviation staff of 24 pilots, 10 Airframe & Powerplant (A&P) mechanics, 28 administrative/support personnel, 8 communication specialists, and 5 employees at the LifeFlight foundations. The multiplied effects of these direct jobs are:

- **Total Economic Impact: 230 Jobs**
- **\$15.13 million in Incomes**
- **\$38.81 million in Total Output**
- **\$1.25 million in State and Local Taxes Annually**

In a typical year LifeFlight transports approximately 2,300 patients. LifeFlight cares for all patients – regardless of their ability to pay. Patient fees cover most operational expenses, but the operation also relies on donors to the LifeFlight Foundation to support the purchase of aircraft, medical equipment, aviation infrastructure enhancements, and providing education and training for the LifeFlight crews and community partners across the state.





## HISTORY AND MISSION

As recently as 1998, Maine was the only state in the nation without full time aeromedical transport. Major trauma centers did not have helipads. There were only two helipads at community hospitals in Rockport and Sanford. The infrastructure did not exist to support aeromedical operations statewide. There was no effective communication system in place, there were no adequate maintenance facilities, weather reporting was limited in rural areas and on the islands, and outside of major airports, fuel availability was virtually nonexistent.

Over 25 years, LifeFlight has built a state-of-the-art EMT system supporting safe delivery of aviation medicine with:

- 33 hospital helipads
- 10 community helipads
- 158 remote access landing zones
- Over 3,165 planned emergency rendezvous landing zones
- Remote fueling capabilities for rural hospitals
- Helping with weather observation systems at each of the state's system airports, as well as additional locations at hospitals, selected islands, and remote locations
- Advanced IFR Capable aircraft with 39 advanced instrument flight navigation approach and departure procedures at hospitals and islands

As needs were assessed, LifeFlight of Maine was started as a private nonprofit organization with a public mission serving as the state's only emergency air ambulance service. The mission is to ensure that every person, in every community, has access to critical care and medical transport when they need it most.

To date, over 35,000 patients have been transported from every County in Maine, and over 430 of the state's 483 Cities, Towns, and Plantations.

# LifeFlight's Contribution to Maine's Aviation Infrastructure

One example of LifeFlight's added economic impact that is not measured in annual estimates, is the construction of helipads, fueling facilities, and visual weather observation systems across the state. A suitable helipad may be as simple as a 25-foot diameter paved surface capable of supporting 14,000 pounds in a cleared area with a 60-foot or larger radius. They can be as complex as rooftop platforms that anchor into a hospital's structural framework, with access into the hospital for patients and medical crews.



Each of these facilities generate jobs and wages for design, materials/equipment, construction/installation, operations, and maintenance. They serve to enhance the state's aviation capabilities for all operators.

## MOBILE INTENSIVE CARE UNITS

LifeFlight operates five (5) twin-engine instrument flight capable air ambulance helicopters, a twin-engine Beechcraft King Air 200 airplane, and a variety of specialized ground vehicles on call 24/7, 365 days a year. LifeFlight has plans to add another Beechcraft King Air 200. All aerial platforms are equipped as mobile intensive care units (ICU's), bringing advanced medical team skills, technology, and highly capable emergency care directly to patients – wherever they may be in the state.

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The vastness of Maine, coupled with limited resources and specialized staff at many rural healthcare facilities, requires each aircraft to have more than \$500,000 of specialized medical equipment onboard, along with additional medications not usually found in typical EMT aircraft. These aerial hospitals are strategically based at three (3) airports across the state:

- **Sanford Seacoast Regional Airport (SFM)**
- **Auburn-Lewiston Municipal Airport (LEW)**
- **Bangor International Airport (BGR).**



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This “total access” to virtually every remote corner of the state has the added benefit of providing “peace of mind” for residents and visitors of Maine. In addition, this peace of mind opens many areas of the state to business development and tourism revenues that would otherwise be limited by individuals concerned about timely access to essential health care. This access ultimately translates into additional jobs and an improved state economy.

## JOSHUA DICKSON – DIRECTOR OF AVIATION SERVICES – EXPLAINS THE LIFEFLIGHT MISSION

“Due to limited medical resources in most of the locations we serve across the state, our aircraft are equipped with a mobile lab unit; heart, blood pressure, and breathing monitors; intravenous (IV) infusion pumps, ventilators, electrical stimulation to change heart rhythms, and a much deeper store of pharmaceuticals to address virtually any condition our teams may encounter. Our aircraft and highly trained staff are as close to an actual hospital ICU as we are able equip them.”

### THE IMPORTANCE OF LIFEFLIGHT’S ABILITY TO OPERATE VIRTUALLY ANYWHERE

The geography of Maine is a big challenge. The service area is 50,000-square-miles of the most heavily forested region outside of Alaska. Add hundreds of coastal islands with full-time and seasonal populations, and four or five months of winter weather and one can begin to understand what medical flight crews are up against. Other challenges are the demographics and economics of the state. Maine is the most rural state in the country as measured by population outside of urban centers. Maine has the oldest population by average age in the country, and a resource-based economy with limited insurance coverage. Josh Dickson adds, “The east-west road network is characterized in many remote areas by, ‘You can’t get there from here’ due to inadequate ground access. So you can see, we give people a second chance they might not have otherwise.”

“We give people a second chance.”



# The Importance of Airports to LifeFlight's Operations



While LifeFlight helicopters have the ability to operate in thousands of landing zones across the state, the twin engine LifeFlight King Air 200 must have access to a safe landing strip. The King Air is faster and more efficient over long distances than the helicopters, with the added ability to climb above certain types of inclement weather. This is vital to conducting transportation operations with patients originating in locations beyond a certain helicopter flight radius, or who require transport to specialized facilities further away.

12% of patients are taken to Boston and beyond for specialized care not available in state.

This service provides rural hospitals and patients an invaluable link to specialists and more fully staffed and equipped trauma centers. LifeFlight is working with the MaineDOT, the FAA, and communities to improve runways to support access to the King Air across rural Maine, with projects in Rangeley, Jackman, Eastport, Biddeford, and Machias.

A recent study revealed that nearly a third of Maine's rural hospitals are facing the risk of closure. That means that functional airstrips are more important than ever. Not only do crews bring patients to hospitals, but they also deliver what's essentially ICU-level care to remote areas. "For us, airports are health-care facilities," Dickson says. "We can drop an aerial hospital – on-demand – at a moment's notice. For this reason, we view investment in rural airports is an investment in health care."

# Introduction to Patient AirLift Services (PALS)

Patient AirLift Services is a non-profit network of volunteer pilots and support staff that arrange free flights for medical patients and family members in Maine who require medical diagnosis, treatment, or follow-up and are unable to afford typical EMT service or to fly commercially. These are patients who might otherwise be unable to travel due to the discomfort of a long drive in an automobile. Although not affiliated with LifeFlight, PALS serves as a much-needed safety net for families with a family member who has a recurring need for transport to specialists for ongoing treatments. In this scenario, the services provided by LifeFlight would become cost prohibitive.

PALS also provides emotional support to the families, often by arranging compassionate mission flights for family members of patients to ensure they have support when they are away from home for long periods. PALS also assists military personnel and their families with free flights as an aid in the recovery and rehabilitation processes for our wounded veterans. Additionally, PALS has a long history of supporting humanitarian efforts in the event of natural or man-made disasters.



# PALS provides a valuable service to Maine families by helping them access the medical care they need.



## JIM PLATZ

Jim Platz is Chairman of the Board of Directors of Patient AirLift Services and has served on the board since its inception. Jim has over 17 years' experience as a volunteer pilot and has flown more than 4,000 missions and logged over 7,000 hours of volunteer flying time, most of which in a twin engine Cessna 414. When speaking of his experiences with Patient Airlift Services, Jim says "I am continually amazed by the courage, determination, faith, and positive attitudes that our patients show in the face of challenging situations. It is an honor and a privilege to be a part of these people's lives."

## THE IMPACT OF ONE VOLUNTEER PILOT TO MAINE FAMILIES OVER 17 YEARS:

- 7,000 Hours Flying Time
- 4,000 Missions
- 1.75 Average Hours per Flight
- Twin Engine Cessna 414
- Operational Cost of \$800 per hour
- Pilot Time \$200 per hour

This represents a real value of \$7 Million donated to transporting medical patients, military personnel, and their family members. By the time comparable margins charged by similar for profits services are included, the market value of patient transfers provided by this single pilot are valued at an annual average of more than \$617,000 in flight services.







## **Maine Economic Impact**

[www.maine.gov/mdot/aviation](http://www.maine.gov/mdot/aviation)

### **MaineDOT**

16 Statehouse Station

Augusta, ME 04333

Ph: 207-624-3000



Five-Day Economic Impact

## INTERNATIONAL SEAPLANE FLY-IN

Since 1976, the event annually attracts hundreds of participants and over 5,000 spectators.



**14.5 JOBS**  
Total Employment



**\$1.1 MILLION**  
Total Dollar Impacts



**\$402,300**  
Total Income Impacts



**\$104,900**  
State and Local



# SEAPLANE ACTIVITIES

There's an old New England expression frequently attributed to rural Mainers when asked for directions, "You can't get there from here."

With a total area of 35,380 square miles, Maine is roughly equal in size to the other five New England states combined. The state features 436,064 acres of state and national parks and has over 21,000 miles of public highways – exceeding any other New England state. Even so, its rugged terrain makes the construction of roads a daunting challenge in many areas. As the most heavily forested state in the lower 48, Maine has vast tracts of remote wilderness, seldom accessed by humans. A drive of more than a few miles often necessitates a winding route between hills and around bodies of water. As such, ground transportation is severely limited in many parts of the state.

## THOUSANDS OF POSSIBLE LANDING AREAS

Seaplane operations in Maine offer citizens and visitors the opportunity to access many of the 6,000 lakes and ponds filled with freshwater game fish, abundant wildlife, and to enjoy the solitude of remote mountain cabins along their shores. Seaplanes also provide access and emergency services to some of the most remote areas in the continental United States.

## TIME MACHINES

It's been said that being transported from modern civilization with all its distractions, to a simple cabin along a remote Maine shoreline is much like entering a world first encountered by the Pilgrims and early explorers. In many cases, there are no phones (no cell signals), no electricity, no running water, or other modern amenities. In other camps, visitors enjoy all the modern conveniences, including room service. The ability to conveniently access otherwise isolated wilderness areas facilitates many tourism and economic activities that just would not be profitable otherwise. For this reason, these unique aircraft are a vital part of aviation in Maine.



Seaplanes also connect with Maine's National Plan of Integrated Airport Systems (NPIAS) airports when they use airport infrastructure other than runways, such as AWOS and remote weather cameras for flight planning and operational safety. Their ability to provide "last mile" transport provides a reliable connection between seaplanes and the NPIAS airport system. Even so, they are relatively unknown and underappreciated except to those who utilize them directly.

## **A MOVING TARGET**

No one knows precisely how many seaplanes there are operating in the State. This is in part because the FAA does not distinguish between aircraft on floats and aircraft on wheels, or on skis for that matter. The other issue is that Maine aviators are a resourceful bunch and are prone to swap their floats for skis to keep operating when the lakes and ponds freeze over, or for wheels when other needs require.

Steve Williams is Chairman of the Maine Seaplane Pilots Association and also serves on the board of the International Seaplane Fly-In in Greenville. He estimates there are about 150 seaplanes operating in the state. Of these, 15 or so are involved in commercial activities from sightseeing flights, to transporting passengers and their gear to remote lakeside camps. Approximately 10 are involved in governmental operations including forestry management, fire protection, inland/marine fish and game management, and emergency response. The balance are privately owned and operated.

## **THE AMERICAN SPORTSMAN**

A true Mainer, Andy Rowe is a licensed bush pilot, seaplane pilot, a U.S. Coast Guard (USCG) Master Mariner, and currently serves as the Maine state liaison for the Recreational Aviation Foundation (RAF). The RAF is a nonprofit volunteer-based organization dedicated to the mission of "preserving, improving, and creating airstrips for recreational access." Among Andy's unique credentials was his role as a cameraman for ABC's "American Sportsman" hosted by Curt Gowdy. Andy shot nearly 1,000 television episodes and found the time to sail the Atlantic from Cape Town, South Africa to Spitzbergen, Norway. Of all the places Andy has been, he chose to make Maine his permanent home.

# Preserving AIRPORTS

The RAF and The Nature Conservancy (TNC) have an agreement allowing the RAF to manage recreational aviation use of Red Pine Airfield, located within TNC's Saint John River Forest in northern Maine about a dozen miles from the Canadian border. Andy and fellow RAF Maine Liaison Steve Mason have installed signage and a windsock, and have organized workdays at the airfield, with volunteers mowing and weed eating. The airfield is now open for the enjoyment of park visitors and availability for emergency services.

Charles A. Chase Memorial Field in Dover Foxcroft (44B) was set to be replaced with a solar farm, which would have been a great loss for general aviation in Maine. Andy and Steve combined forces with RAF state liaisons from New Hampshire and Massachusetts to organize efforts to preserve the 2,926-foot by 75-foot grass strip field and save it from closure. In addition, Andy identified Cowboy's Air Ranch Airport in Washington County for a 1,500-foot runway extension to make it more accessible, and the RAF also assisted the Fish River Flying Club to re-open Fort Kent Municipal Airfield in Maine. The bottom line is active preservation of small GA airports.

Andy claims one of his greatest pleasures comes from flying into a remote area with a clean lake and good muskie fishing in the colorful fall foliage. In his words, "Flying in saves hours of driving and being beaten up on logging roads."



# INTERNATIONAL SEAPLANE FLY-IN

- 200 Float Planes
- 300 Conventional Planes
- 5,000 Spectators
- 5 Days / 4 Nights
- Peak Season for Retail/Restaurants/Hotels/and Vendors



## AN ECONOMIC BOOM

Since 1976, The International Seaplane Fly-In has attracted hundreds of participants the week after Labor Day to celebrate their unique culture on Moosehead Lake in Greenville. Over 5,000 spectators come from across the U.S. and world. When weather is good, over 200 float planes fill the lake while 300 wheeled aircraft compete for space at the nearby airfield.

It's impressive that a single event of only five days and four nights generates more than \$1.11 million in total impact, supports nearly 15 full time jobs, and delivers over \$104,900 in state and local taxes. Many of Greenville's establishments have come to count on the event generating their make-or-break income for the year. Enterprising vendors set up kiosks along the east side of the Cove. They sell unique fare and wares from fresh Maine lobster rolls, fried foods, and onion rings; to t-shirts, locally made crafts, signature Moosehead Lake items, and event souvenirs. After a full day enjoying float plane contests and events, visitors fill local restaurants and pubs surrounding the Cove to refuel and relax. The significance of this event for the local economy is immense.

Over a Five Day Span the Fly-In Generates:

- **14.5 full time equivalent jobs**
- **Over \$402,300 in Income**
- **More than \$1.11 million in Total Impact**
- **Over \$104,900 in State and Local Taxes**



# Naples Seaplane ADVENTURES

Seaplane rides have been an attraction on Long Lake in Naples since 1929. Matthew McFadden came to Maine in 2005 to earn his seaplane rating. He then worked the next eight years as an instructor in both land and sea planes, giving scenic flights, and working as an aircraft mechanic. Since 2014, Matt can be found on Long Lake from May through mid-October serving as the chief pilot and proprietor of Naples Seaplane Adventures, carrying on a tradition spanning 93 years.

Matt serves over 2,000 passengers each season. Some are repeat customers, who return year-after-year. Others are first time flyers seeking an adventure with family and friends. His peak season is late July through early August when he operates as many as 20 scenic flights a day in good weather. Matt makes certain everyone is safe and has a great experience.

In the off season, Matt continues to give both land and sea flying lessons and performs aircraft maintenance. So, between various essentials such as parts and maintenance, fueling, printing, signage, tee shirts, hats, stickers, etc., even a small one-man seaplane operation has the ability to support 3.6 jobs and more than \$388,200 of total economic output.





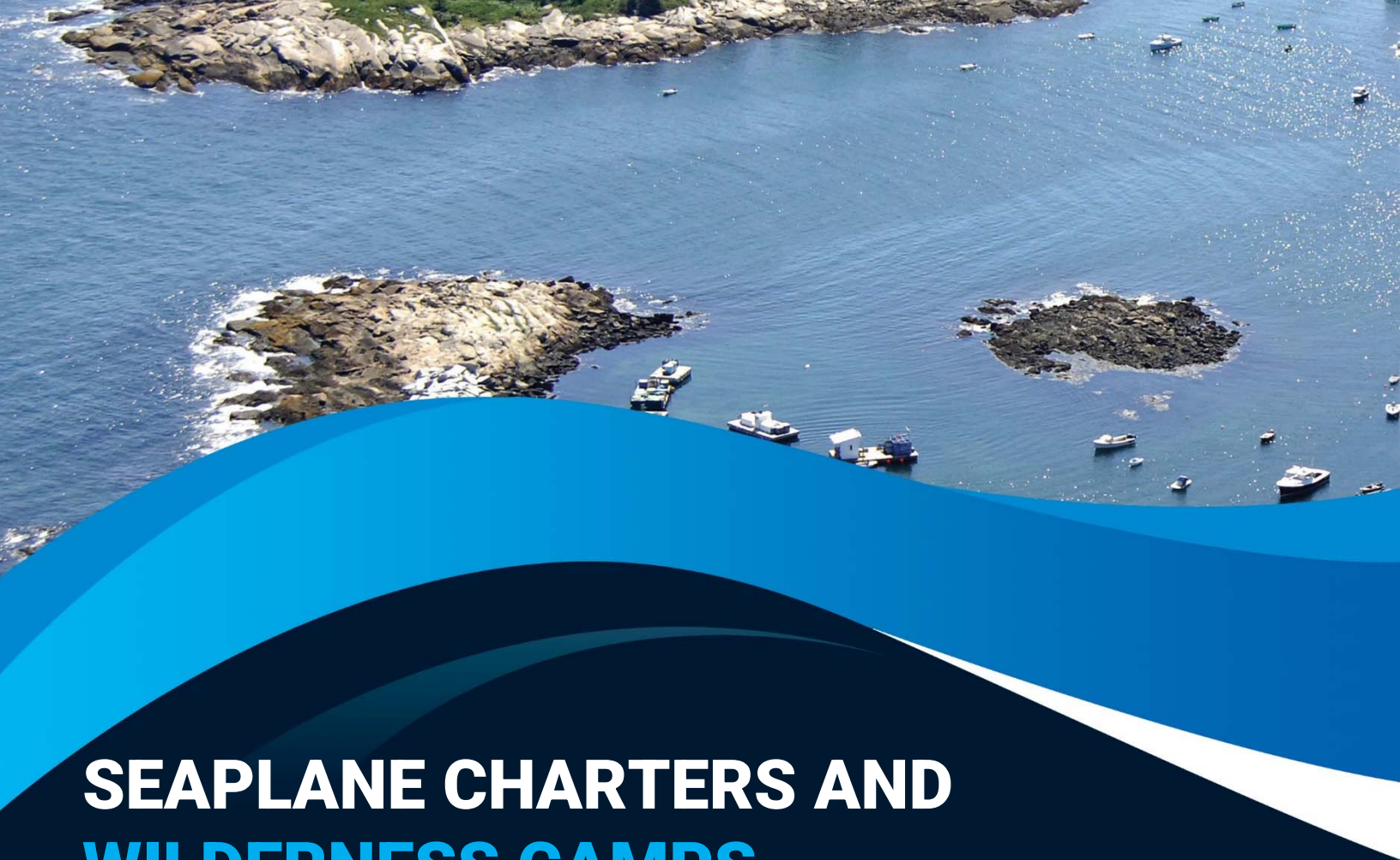
# Maine's Seaplane Bases

Seaplane bases are FAA designated runways on the water, whether it be a lake, pond, river, or saltwater bay. Many of these offer AvGas and other services. After 76 years of service, Twitchell's Airport and Seaplane Base in Turner, Maine closed in November 2022. The airport land was sold. This dropped the total number of recognized seaplane bases in Maine to 46. In April 2023, it was announced that Twitchell's Seaplane Base would be reopening in May 2023. There are discussions regarding the establishment of a new seaplane base on Flagstaff Lake in the near future. This would bring the total to 48 seaplane bases in the state.



## **EVEN A SMALL ONE-MAN OPERATION CAN GENERATE:**

- **3.6 full time equivalent Jobs**
- **Over \$209,100 in Income**
- **More than \$388,200 in Total Impact**
- **Over \$28,500 in State and Local Taxes**



# SEAPLANE CHARTERS AND WILDERNESS CAMPS

Katahdin Air Service is a small seaplane charter operation located on Ambejejus Lake. Katahdin Air transports charter passengers and their gear to various remote camps around the state, offers daily scenic plane rides of the Katahdin Area from short 30-minute and one-hour scenic flights as well as 3-hour flights that take guests to a remote sporting camp for dinner and then a sunset flight back to the seaplane base. Some of the larger camps operate their own float planes, while others partner with seaplane operators – such as Katahdin Air – to transport into and out of camps in the vast Northwoods. Katahdin Air Service has been transporting people to remote locations in northern Maine for 60 years. Many guests enjoy sightseeing tours of Mt. Katahdin, Baxter State Park and the West Branch of the Penobscot River. Fall foliage flights are also popular.

Katahdin Air Service is owned and operated by Penobscot Island Air and utilizes two Cessna 206 floatplanes for charter during the open water season (typically May 1 through October 31). Katahdin Air employs four full time and two part time personnel seasonally, and logs just over 800 hours of flight time annually.





## RELATED INDUSTRIES

PK Floats was founded in 1954 and employs a dozen skilled staff in Lincoln, Maine. PK craftsmen construct around 20 sets of high quality, riveted aluminum amphibious aircraft floats every year for a variety of aircraft types. The price for a set of new custom floats is between \$60,000 to \$100,000, depending on aircraft model and finishes required. PK Floats has a backlog of over 12 months and has a loyal following.

Clamar Floats is the leading manufacturer of light weight, high performance, composite floats that incorporate the latest material infusion technology utilizing Kevlar, Carbon Fiber and e-glass materials. Clamar moved from Canada to Brunswick Maine in 2018.

At the time of this report, Clamar employed six manufacturing personnel with plans to expand. Currently, their amphibious floats range from \$35,000 to \$55,000 per set, and the company enjoys a six month backlog.

## THE GREATEST IMPACT

In conclusion, while seaplanes contribute significantly to commerce, tourism, and safety, perhaps their most meaningful impact lies in enhancing the quality of life for Mainers and visitors. From all the functions and activities outlined above, to simply utilizing hangars and maintenance services at airports across the state during the winter months, this relatively small but essential aviation segment embodies the preservation of history and the improvement of citizens' lives, making it an integral part of Maine's aviation identity.





## **Maine Economic Impact**

[www.maine.gov/mdot/aviation](http://www.maine.gov/mdot/aviation)

### **MaineDOT**

16 Statehouse Station

Augusta, ME 04333

Ph: 207-624-3000



Annual Economic Impact

# **PENOBSCOT ISLAND AIR**

Knox County Regional Airport (RKD)



**67 JOBS**

**Total Employment Impacts**



**\$3.2 MILLION**

**Total Income Impacts**



**\$6.55 MILLION**

**Total Dollar Impacts**



**\$547,700**

**State and Local Taxes**



There's an old saying in aviation, "If you want to make a small fortune in aviation, start with a large one." Kevin Waters at Knox County Regional Airport (RKD) in Owls Head, Maine did not have a large bank account. His fortune was his heart for doing good to help others.

Shortly before Christmas 2004, the air operator that had been providing passenger air taxi and parcel delivery service to the residents and visitors of the islands in Penobscot Bay abruptly ceased operations. Kevin went to the FAA the next day and informed them, "We need to keep this going. There are too many people who depend on this service." Islanders on Matinicus called a special meeting and collected about \$17,000 in cash to assist Waters as a "no strings attached" infusion to restart air service to the islands.

### **A SINGLE AIRCRAFT TAKES FLIGHT**

Penobscot Island Air (PIA) took flight in January 2005 with one single engine Cessna aircraft capable of transporting four passengers and a small amount of cargo. The operation steadily grew, adding aircraft and personnel while building upon Kevin's steady message to staff and customers, "You count, and don't forget it." Sadly, Kevin passed away July 5, 2020, at age 62.

### **LEGACY AND RESILIENCE**

In the sorrow and disruption that followed, Kevin's wife Terry – a registered nurse – with the reassurance of PIA staff, stepped in to take on the day-to-day operations and management of PIA. The staff functioned as one big family to keep things going and to serve their customers.







## ISLAND TRANSPORTATION

The essential role of air services cannot be overstated, especially when it comes to emergencies and the economic well-being of island communities. Today, Penobscot Island Air continues operations from RKD with a fleet of six (6) Cessna 206 and 207 aircraft. These light four-passenger single prop aircraft transport over 10,000 passengers and deliver more than 250,000 packages to the islands annually.

PIA also operates vans and a utility boat for these deliveries that include essential machine parts and materials, food, beverages, medicine, U.S. Mail, FedEx, UPS, etc., as well as the occasional dog, cat, pig, bicycle, wedding cake or wedding gown. Simply put, PIA is a lifeline for islanders. The islands served are Islesboro, North Haven, Vinalhaven, and Matinicus. Charter flights are available to two dozen regularly served locations across Maine and occasionally Canada.



# Air Service IMPORTANCE

The Maine State Ferry Service provides transportation to several of the islands, but this service is limited. In peak season – from April through October – the state ferry makes four trips a month to Matinicus; two trips a month in March and November; and one trip a month in December and January. The trip takes two hours and fifteen minutes each way in relatively calm seas. If the waves are up, the service is postponed. If there were no air service, a large portion of island residents and tourists would go somewhere else. The potential economic impact would be significant.

In addition to this, Penobscot Island Air (in combination with Cape Air) helps Knox County Regional Airport meet the minimum threshold of 10,000 passenger enplanements annually to ensure \$1 million each year in FAA AIP (airport improvement plan) entitlement funding. These funds help keep RKD in optimum operational condition.



# Comprehensive OFFERINGS

The staff at Penobscot Island Air, consisting of up to 30 highly skilled personnel, provides a comprehensive array of services designed to cater to the diverse requirements of their clientele.

## EMERGENCY MEDIVAC TRANSPORTATION

PIA provides Medevac transport service to the islands of Penobscot Bay as part of PIA's commitment to the island communities. This is done at no cost to patients or medical providers. PIA covers all pilot, fuel, and aircraft expenses. Some years the number of these flights exceeds 300. These are typically initiated by EMTs requesting transports. PIA pilots and aircraft transport the EMTs and patients from the islands to mainland hospitals.

## ESSENTIAL GOVERNMENT SERVICES

In addition to the U.S. Mail and freight deliveries, PIA provides flights for the U.S. Fish and Wildlife Service and U.S. Forest Service as they conduct air surveys of wildlife, watersheds, land, and fisheries.

## LOCAL AIRCRAFT CHARTER

PIA will arrange short-range passenger charters to accommodate the unique needs of traveling customers, as well as coordinating long-distance air charter needs beyond Knox County Regional Airport. This often includes coordination of ground transportation and connecting with jet or turboprop air charter aircraft.

## SIGHTSEEING AND LIGHTHOUSE TOURS

PIA regularly schedules scenic flights providing guests a panoramic aerial view of Penobscot Bay. Fall foliage and lighthouse tours are also very popular. This is very much a boost to the tourism economy both directly as aircraft and pilots are booked and paid for the flights; and indirectly as photos and adventures are posted to social media.





## SEAPLANE CHARTERS

Katahdin Air Service is located about 115 air miles north of RKD near Millinocket. Katahdin Air is owned and operated by PIA offering two Cessna 206 floatplanes for charter during the open water season (typically May 1 through October 31).

This service transports charter passengers and their gear to various remote camps around the state, as well as daily scenic plane rides of the Katahdin Area via short 30-minute or one-hour scenic flights to Mt. Katahdin, Baxter State Park, the West Branch of the Penobscot River, and Fall foliage flights. A special 3-hour dinner flight is available to a remote sporting camp for dinner and a sunset flight back to the seaplane base. Katahdin Air employs four full time and two part time personnel seasonally, and logs just over 800 hours of flight time annually.

## FLIGHT TRAINING

Most of PIA's pilots have their Certified Flight Instructor ratings and provide pilot training to 15 – 16 students annually. Not only does this activity result in nearly \$200,000 of additional direct revenue to PIA, with induced impacts multiplied as those dollars are further spent in the local economy, but this service is developing a future workforce while doing its small part in helping to alleviate the national shortage of pilots.

# Statewide IMPACT

Construction has recently been completed on a new \$4.8 million hangar for PIA at RKD. It will provide areas for administrative office space, flight training, a severe weather shelter for aircraft, maintenance operations, package handling and loading, etc., greatly improving facilities for PIA's mission and operations. 40 jobs were created during the construction of the hangar.



# THE FUTURE

In the wake of the COVID-19 pandemic, operational costs have risen steeply. Fuel costs are higher; labor, maintenance, and insurance costs have increased, while downward pressure exists on maintaining current airfares. Add to this the change in the demographics of the islands, from working lobstermen and fishermen, to travelers and a tourism economy. The island of Matinicus for example, had as many as 280 full time residents in the late 1800s. By 2010 that number dropped to about 75. Today, Matinicus has only 14 to 15 full-time residents during the winter months. This greatly reduces any economies of scale and incentives for maintaining current frequencies of operations.

The runway on North Haven is privately owned, and between May and October PIA operations are restricted to two flights per day Monday through Friday, between the hours of 9:00 AM and 4:00 PM, and one flight per day Saturday and Sunday. This greatly reduces opportunities to transport contractors, laborers and tradespeople, who typically need to travel outbound around 7:00 AM and return between 5:00 and 7:00 PM.

One alternative that is being pursued by PIA is the transition to unmanned aerial vehicles (UAV). PIA has inked a letter of intent to acquire a PYKA Pelican Cargo UAV. This is a fully autonomous electric aircraft capable of transporting 400 pounds of mail and cargo up to 200 miles in virtually all-weather conditions on one charge.





This equates to four roundtrip flights to the islands served by PIA on a single charge. This aircraft is virtually silent and requires a mere 400 feet of rollout for takeoff. Many days on Penobscot Bay are shrouded with heavy fog obscuring visual flight opportunities for pilots. Flights must be delayed until the fog lifts. The ability to operate in weather conditions that keep manned aircraft grounded is a boost in efficiency and productivity.

As the technology evolves, PIA is seeking to deploy larger advanced air mobility aircraft to transport passengers to and from the islands. These flights will initially involve a human pilot aboard but will evolve to provide a fully autonomous experience. The payload for these aircraft is reported to be 1,500 pounds, which will easily accommodate four passengers, their baggage, as well as a bit of mail or cargo. It is anticipated that this will reduce labor costs,

enhance safety, and provide an environmentally friendly service platform. The electrical infrastructure that will facilitate charging aircraft batteries will also permit the airport to add electric vehicle charging stations for ground-based transportation. PIA is also evaluating the addition of a solar array to help offset energy costs.

## **BEYOND PENOBSCOT BAY**

As it turns out, the care and compassion that drove Kevin Waters to launch his vision of PIA as a vital resource and true neighbor for the citizens in the Penobscot Bay region, has actually grown to have statewide significance, creating 30 direct jobs, supporting tourism, educating the workforce, and providing critical access and essential services to the people in Maine making Penobscot Island Air a very good neighbor indeed.







## **Maine Economic Impact**

[www.maine.gov/mdot/aviation](http://www.maine.gov/mdot/aviation)

### **MaineDOT**

16 Statehouse Station

Augusta, ME 04333

Ph: 207-624-3000

APPENDIX B

# Tables w/Aggregated Results



**Table B-1: Total Impacts**

Total Impacts (Airports)	Total Jobs	Annual Earnings	Annual Economic Activity
Commercial Service (6)	13,640	\$676,389,500	\$1,674,238,500
General Aviation (29)	782	\$45,395,500	\$115,909,900
<b>Total (35)</b>	<b>14,422</b>	<b>\$721,785,000</b>	<b>\$1,790,148,400</b>

Source: IMPLAN Modeling by Consultant, 2023.

**Table B-2: Airport Economic Impact by MSASP Region**

Region (Airports)	Total Jobs	Annual Earnings	Annual Economic Activity
Central (10)	3,190	\$165,977,600	\$398,594,100
Coastal (7)	538	\$29,600,900	\$84,448,700
Southern (3)	10,135	\$486,816,700	\$1,193,511,700
Northern (6)	441	\$33,945,600	\$96,789,700
Western Mountains (6)	84	\$3,981,200	\$11,546,100
Washington County (3)	34	\$1,463,000	\$5,258,100
<b>Total (35)</b>	<b>14,422</b>	<b>\$721,785,000</b>	<b>\$1,790,148,400</b>

Source: IMPLAN Modeling by Consultant, 2023.

**Table B-3: Economic Impact by Airport Role**

Airport Role (Airports)	Total Jobs	Annual Earnings	Annual Economic Activity
Primary (5)	13,539	\$670,387,200	\$1,660,232,900
Regional (3)	312	\$17,751,300	\$45,320,600
Local (14)	420	\$26,558,600	\$62,613,400
Basic (10)	149	\$6,991,000	\$21,743,400
Unclassified (3)	3	\$96,900	\$238,100
<b>Total (35)</b>	<b>14,422</b>	<b>\$721,785,000</b>	<b>\$1,790,148,400</b>

Source: IMPLAN Modeling by Consultant, 2023.

**Table B-4: Total Economic Impacts**

LOC ID	Airport Name	Employment	Income	Output
AUG	Augusta State	101	\$6,002,300	\$14,005,600
BGR	Bangor International	2,808	\$141,333,700	\$341,980,000
BHB	Hancock County - Bar Harbor	123	\$6,789,100	\$18,166,700
RKD	Knox County Regional	243	\$13,325,200	\$41,118,600
PWM	Portland International Jetport	10,007	\$479,495,300	\$1,175,466,500
PQI	Presque Isle International	358	\$29,443,900	\$83,501,100
LEW	Auburn/Lewiston Municipal	101	\$5,506,600	\$16,282,900
BST	Belfast Municipal	11	\$526,500	\$1,711,200
OB1	Bethel Regional	16	\$789,400	\$1,484,100

**Table B-4: Total Economic Impacts**

<b>LOC ID</b>	<b>Airport Name</b>	<b>Employment</b>	<b>Income</b>	<b>Output</b>
B19	Biddeford Municipal	18	\$1,079,000	\$3,013,100
BXM	Brunswick Executive	149	\$8,411,300	\$21,722,500
CAR	Caribou Municipal	13	\$607,300	\$2,201,900
OWK	Central Maine Regional	6	\$281,900	\$713,700
44B	Charles A. Chase Jr. Memorial Field	2	\$49,900	\$120,100
OLD	Dewitt Field, Old Town Municipal	49	\$3,519,200	\$6,300,500
1B0	Dexter Regional	16	\$851,200	\$2,558,600
IZG	Eastern Slope Regional	7	\$330,400	\$998,400
EPM	Eastport Municipal	14	\$580,800	\$2,199,300
3B1	Greenville Municipal	6	\$180,100	\$560,100
HUL	Houlton International	16	\$793,300	\$2,484,900
57B	Islesboro	1	\$34,500	\$93,200
LRG	Lincoln Regional	29	\$1,812,600	\$5,311,900
MVM	Machias Valley Municipal	8	\$339,000	\$1,143,200
MLT	Millinocket Municipal	16	\$842,000	\$1,820,100
59B	Newton Field	15	\$871,900	\$2,614,300
FVE	Northern Aroostook Regional	9	\$446,500	\$1,469,800
81B	Oxford County Regional	26	\$1,266,400	\$2,598,900
2B7	Pittsfield Municipal	33	\$4,454,800	\$7,440,200
PNN	Princeton Municipal	13	\$543,200	\$1,915,600
SFM	Sanford Seacoast Regional	110	\$6,242,400	\$15,032,100
8B0	Stephen A. Bean Municipal	30	\$1,331,600	\$4,692,800
93B	Stonington Municipal	0	\$12,500	\$24,800
B21	Sugarloaf Regional	10	\$477,800	\$1,196,400
WVL	Waterville Robert LaFleur	49	\$2,711,600	\$6,593,600
IWI	Wiscasset	11	\$501,800	\$1,611,700

Source: IMPLAN Modeling by Consultant, 2023.

APPENDIX C

# Airport IMPLAN Results



## Economic Impacts for Augusta State, Kennebec County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$4,386,100
Airport Expenditures	\$9,101,000
Airport-Related Employment	70 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$4,904,500
Total Induced Employment Impacts	31 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$14,005,500</b>
<b>Grand Total Income Impacts</b>	<b>\$6,002,300</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>101 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$863,300</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### AUG Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>70.5</b>	<b>12.3</b>	<b>18.3</b>	<b>101.1</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.1	0.2
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.1	0.0	0.1
23 Construction	3.5	0.2	0.1	3.9
31-33 Manufacturing	0.0	0.1	0.0	0.1
42 Wholesale Trade	0.0	0.4	0.5	0.9
44-45 Retail trade	2.5	0.7	3.4	6.5
48-49 Transportation & Warehousing	27.7	1.8	0.5	29.9
51 Information	0.0	0.2	0.2	0.4
52 Finance & insurance	0.0	0.6	0.7	1.3
53 Real estate & rental	3.0	1.0	0.6	4.5
54 Professional- scientific & tech services	0.0	0.7	0.6	1.3
55 Management of companies	0.0	1.0	0.3	1.3
56 Administrative & waste services	0.0	1.4	0.6	2.0
61 Educational services	0.0	0.1	1.0	1.1
62 Health & social services	0.0	0.0	5.1	5.1
71 Arts- entertainment & recreation	2.8	0.3	0.5	3.6
72 Accommodation & food services	18.0	2.2	2.3	22.4
81 Other services	0.0	1.2	1.8	3.0
92 Government & non NAICs	13.0	0.4	0.2	13.6
<i>Multiplier</i>	1.43			

### AUG Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$4,386,120</b>	<b>\$676,438</b>	<b>\$939,745</b>	<b>\$6,002,303</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$917	\$2,307	\$3,224
21 Mining	\$0	\$700	\$39	\$739
22 Utilities	\$0	\$8,240	\$6,361	\$14,601
23 Construction	\$194,094	\$10,183	\$7,753	\$212,031
31-33 Manufacturing	\$0	\$7,007	\$2,781	\$9,789
42 Wholesale Trade	\$0	\$36,025	\$38,816	\$74,841
44-45 Retail trade	\$78,933	\$31,602	\$125,854	\$236,389
48-49 Transportation & Warehousing	\$1,860,747	\$110,063	\$28,281	\$1,999,091
51 Information	\$0	\$13,298	\$14,173	\$27,471
52 Finance & insurance	\$0	\$38,514	\$40,075	\$78,588
53 Real estate & rental	\$134,098	\$37,045	\$19,345	\$190,487
54 Professional- scientific & tech services	\$0	\$47,525	\$36,943	\$84,468
55 Management of companies	\$0	\$89,817	\$24,050	\$113,867
56 Administrative & waste services	\$0	\$65,608	\$28,278	\$93,886
61 Educational services	\$0	\$3,075	\$46,671	\$49,746
62 Health & social services	\$0	\$4	\$342,653	\$342,658
71 Arts- entertainment & recreation	\$65,877	\$3,061	\$9,508	\$78,446
72 Accommodation & food services	\$643,536	\$67,456	\$66,500	\$777,493
81 Other services	\$0	\$71,900	\$84,365	\$156,265
92 Government & non NAICs	\$1,408,834	\$34,399	\$14,992	\$1,458,225
<i>Multiplier</i>	1.37			

### AUG Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$9,101,009</b>	<b>\$1,967,694</b>	<b>\$2,936,821</b>	<b>\$14,005,524</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$2,187	\$5,407	\$7,593
21 Mining	\$0	\$11,275	\$1,168	\$12,443
22 Utilities	\$0	\$78,786	\$60,886	\$139,672
23 Construction	\$644,366	\$39,508	\$30,986	\$714,861
31-33 Manufacturing	\$0	\$27,157	\$10,653	\$37,810
42 Wholesale Trade	\$0	\$171,233	\$156,555	\$327,788
44-45 Retail trade	\$195,524	\$87,080	\$371,582	\$654,186
48-49 Transportation & Warehousing	\$3,810,984	\$208,480	\$67,117	\$4,086,581
51 Information	\$0	\$70,703	\$71,997	\$142,700
52 Finance & insurance	\$0	\$156,317	\$174,448	\$330,765
53 Real estate & rental	\$965,707	\$242,005	\$618,449	\$1,826,161
54 Professional- scientific & tech services	\$0	\$106,374	\$84,549	\$190,923
55 Management of companies	\$0	\$205,903	\$55,134	\$261,037
56 Administrative & waste services	\$0	\$152,454	\$64,826	\$217,280
61 Educational services	\$0	\$5,366	\$71,347	\$76,713
62 Health & social services	\$0	\$8	\$622,596	\$622,604

**AUG Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$223,690	\$20,706	\$35,260	\$279,656
72 Accommodation & food services	\$1,530,549	\$155,271	\$204,514	\$1,890,333
81 Other services	\$0	\$126,608	\$184,416	\$311,024
92 Government & non NAICs	\$1,730,188	\$100,275	\$44,931	\$1,875,395
Multiplier	1.54			

**AUG Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$114,518	\$42,754	\$68,072	\$225,343
Sub County Special Districts	\$45,605	\$17,051	\$27,151	\$89,807
County	\$7,843	\$2,932	\$4,669	\$15,444
State	\$298,770	\$90,621	\$143,334	\$532,726
Federal	\$733,054	\$101,761	\$147,132	\$981,947
<b>Total Tax Impact</b>	<b>\$1,199,790</b>	<b>\$255,119</b>	<b>\$390,358</b>	<b>\$1,845,266</b>



## Economic Impacts for Bangor International, Bangor, ME MSA

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$101,393,400
Airport Expenditures	\$216,253,500
Airport-Related Employment	2,024 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$125,726,500
Total Induced Employment Impacts	784 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$341,980,000</b>
<b>Grand Total Income Impacts</b>	<b>\$141,333,700</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>2,808 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$21,616,600</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### BGR Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>2,024.4</b>	<b>269.9</b>	<b>513.9</b>	<b>2,808.3</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.3	3.2	3.6
21 Mining	0.0	0.1	0.0	0.1
22 Utilities	0.0	2.4	1.8	4.2
23 Construction	33.4	3.7	4.4	41.5
31-33 Manufacturing	180.0	2.0	0.9	182.9
42 Wholesale Trade	0.0	13.7	11.6	25.3
44-45 Retail trade	108.8	9.8	92.5	211.1
48-49 Transportation & Warehousing	309.9	35.3	15.5	360.8
51 Information	0.0	6.4	5.5	11.8
52 Finance & insurance	0.0	12.3	17.7	30.1
53 Real estate & rental	67.0	23.3	18.4	108.7
54 Professional- scientific & tech services	0.0	24.3	19.2	43.5
55 Management of companies	0.0	23.8	7.5	31.3
56 Administrative & waste services	0.0	45.9	24.4	70.3
61 Educational services	0.0	0.8	13.1	13.9
62 Health & social services	65.0	0.3	138.0	203.3
71 Arts- entertainment & recreation	97.9	6.9	12.6	117.4
72 Accommodation & food services	423.3	24.5	60.0	507.8
81 Other services	8.0	26.1	61.7	95.8
92 Government & non NAICs	731.0	7.9	6.0	745.0
<i>Multiplier</i>	1.39			

### BGR Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$99,342,529</b>	<b>\$14,104,072</b>	<b>\$25,264,421</b>	<b>\$138,711,022</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$7,201	\$43,755	\$50,956
21 Mining	\$0	\$1,762	(\$155)	\$1,608
22 Utilities	\$0	\$355,945	\$255,698	\$611,643
23 Construction	\$1,736,066	\$194,747	\$221,187	\$2,152,001
31-33 Manufacturing	\$14,221,903	\$125,749	\$48,362	\$14,396,014
42 Wholesale Trade	\$0	\$1,045,280	\$848,178	\$1,893,458
44-45 Retail trade	\$3,236,770	\$399,456	\$3,149,822	\$6,786,049
48-49 Transportation & Warehousing	\$13,493,726	\$1,858,512	\$765,980	\$16,118,217
51 Information	\$0	\$403,587	\$340,104	\$743,691
52 Finance & insurance	\$0	\$874,110	\$1,115,423	\$1,989,534
53 Real estate & rental	\$2,571,052	\$694,811	\$524,637	\$3,790,499
54 Professional- scientific & tech services	\$0	\$1,398,593	\$1,069,567	\$2,468,160
55 Management of companies	\$0	\$2,160,180	\$665,884	\$2,826,064
56 Administrative & waste services	\$0	\$1,662,693	\$889,196	\$2,551,889
61 Educational services	\$0	\$27,839	\$441,184	\$469,024
62 Health & social services	\$5,195,668	\$19,473	\$9,728,391	\$14,943,532
71 Arts- entertainment & recreation	\$2,483,901	\$101,082	\$248,643	\$2,833,626
72 Accommodation & food services	\$15,302,580	\$798,165	\$1,694,550	\$17,795,295
81 Other services	\$238,907	\$1,325,530	\$2,744,893	\$4,309,331
92 Government & non NAICs	\$40,861,956	\$649,355	\$469,119	\$41,980,430
<i>Multiplier</i>	1.40			

### BGR Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$216,253,484</b>	<b>\$44,638,118</b>	<b>\$81,088,426</b>	<b>\$341,980,027</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$15,733	\$126,587	\$142,320
21 Mining	\$0	\$31,990	\$9,553	\$41,542
22 Utilities	\$0	\$3,127,569	\$2,288,825	\$5,416,394
23 Construction	\$5,980,000	\$780,368	\$921,164	\$7,681,531
31-33 Manufacturing	\$42,660,367	\$594,848	\$254,374	\$43,509,589
42 Wholesale Trade	\$0	\$4,570,302	\$3,937,756	\$8,508,059
44-45 Retail trade	\$8,148,585	\$1,196,031	\$9,630,719	\$18,975,335
48-49 Transportation & Warehousing	\$27,953,506	\$3,982,640	\$2,125,993	\$34,062,139
51 Information	\$0	\$2,540,440	\$2,331,388	\$4,871,828
52 Finance & insurance	\$0	\$3,351,390	\$4,566,937	\$7,918,327
53 Real estate & rental	\$20,229,897	\$5,460,239	\$17,029,470	\$42,719,607
54 Professional- scientific & tech services	\$0	\$3,140,171	\$2,691,866	\$5,832,037
55 Management of companies	\$0	\$4,901,636	\$1,534,160	\$6,435,796
56 Administrative & waste services	\$0	\$4,432,637	\$2,359,359	\$6,791,996
61 Educational services	\$0	\$60,406	\$800,674	\$861,080
62 Health & social services	\$8,811,149	\$42,935	\$17,545,177	\$26,399,261

**BGR Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$8,313,930	\$669,443	\$1,035,510	\$10,018,882
72 Accommodation & food services	\$34,880,378	\$1,882,800	\$5,373,000	\$42,136,178
81 Other services	\$381,650	\$2,093,114	\$5,022,182	\$7,496,945
92 Government & non NAICs	\$58,894,022	\$1,763,427	\$1,503,731	\$62,161,181
Multiplier	1.58			

**BGR Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$3,429,817	\$873,138	\$1,998,212	\$6,301,167
Sub County Special Districts	\$939,860	\$239,471	\$548,164	\$1,727,495
County	\$272,322	\$69,385	\$158,826	\$500,532
State	\$7,660,896	\$1,691,201	\$3,735,325	\$13,087,423
Federal	\$18,325,267	\$2,431,209	\$4,419,464	\$25,175,940
<b>Total Tax Impact</b>	<b>\$30,628,162</b>	<b>\$5,304,404</b>	<b>\$10,859,991</b>	<b>\$46,792,557</b>

## Economic Impacts for Hancock County- Bar Harbor, Hancock County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$5,218,700
Airport Expenditures	\$12,991,400
Airport-Related Employment	90 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$5,175,300
Total Induced Employment Impacts	33 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$18,166,600</b>
<b>Grand Total Income Impacts</b>	<b>\$6,789,100</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>123 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$1,362,200</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### BHB Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>89.8</b>	<b>19.4</b>	<b>13.9</b>	<b>123.2</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.1	0.0	0.2
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.1	0.1	0.1
23 Construction	7.1	0.2	0.2	7.5
31-33 Manufacturing	12.0	0.0	0.1	12.2
42 Wholesale Trade	0.0	0.3	0.5	0.8
44-45 Retail trade	3.3	4.0	1.8	9.1
48-49 Transportation & Warehousing	25.1	0.5	2.6	28.1
51 Information	0.0	0.2	0.3	0.5
52 Finance & insurance	0.0	0.7	1.0	1.7
53 Real estate & rental	7.0	0.9	1.5	9.4
54 Professional- scientific & tech services	0.0	0.6	0.7	1.3
55 Management of companies	0.0	0.1	0.4	0.5
56 Administrative & waste services	0.0	0.6	1.5	2.1
61 Educational services	0.0	0.7	0.0	0.7
62 Health & social services	0.0	5.1	0.0	5.1
71 Arts- entertainment & recreation	3.0	0.8	0.4	4.2
72 Accommodation & food services	12.5	2.1	0.7	15.3
81 Other services	0.0	2.2	1.8	4.0
92 Government & non NAICs	20.0	0.1	0.3	20.4
<i>Multiplier</i>	1.37			

### BHB Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$5,218,740</b>	<b>\$888,281</b>	<b>\$682,129</b>	<b>\$6,789,150</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$5,275	\$1,517	\$6,792
21 Mining	\$0	\$69	\$2,104	\$2,173
22 Utilities	\$0	\$6,363	\$8,877	\$15,241
23 Construction	\$374,427	\$10,104	\$11,470	\$396,002
31-33 Manufacturing	\$836,119	\$1,316	\$7,964	\$845,399
42 Wholesale Trade	\$0	\$15,715	\$34,903	\$50,618
44-45 Retail trade	\$117,596	\$147,960	\$86,952	\$352,509
48-49 Transportation & Warehousing	\$1,198,838	\$19,038	\$123,678	\$1,341,554
51 Information	\$0	\$10,944	\$15,490	\$26,434
52 Finance & insurance	\$0	\$39,107	\$60,426	\$99,533
53 Real estate & rental	\$353,473	\$18,933	\$31,231	\$403,638
54 Professional- scientific & tech services	\$0	\$41,233	\$40,959	\$82,192
55 Management of companies	\$0	\$13,687	\$80,328	\$94,015
56 Administrative & waste services	\$0	\$18,049	\$42,806	\$60,855
61 Educational services	\$0	\$26,319	\$1,007	\$27,326
62 Health & social services	\$0	\$312,520	\$5	\$312,525
71 Arts- entertainment & recreation	\$118,615	\$26,291	\$4,964	\$149,870
72 Accommodation & food services	\$602,533	\$83,115	\$30,406	\$716,055
81 Other services	\$0	\$81,872	\$73,783	\$155,655
92 Government & non NAICs	\$1,617,138	\$10,370	\$23,258	\$1,650,766
<i>Multiplier</i>	1.30			

### BHB Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$12,991,368</b>	<b>\$3,034,565</b>	<b>\$2,140,691</b>	<b>\$18,166,624</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$7,764	\$2,052	\$9,817
21 Mining	\$0	\$687	\$18,005	\$18,691
22 Utilities	\$0	\$69,283	\$99,889	\$169,172
23 Construction	\$1,264,173	\$40,776	\$45,169	\$1,350,118
31-33 Manufacturing	\$3,691,086	\$8,520	\$41,605	\$3,741,211
42 Wholesale Trade	\$0	\$73,633	\$166,336	\$239,969
44-45 Retail trade	\$274,116	\$441,003	\$238,463	\$953,583
48-49 Transportation & Warehousing	\$1,868,705	\$49,660	\$232,295	\$2,150,659
51 Information	\$0	\$61,365	\$83,069	\$144,434
52 Finance & insurance	\$0	\$188,800	\$265,163	\$453,963
53 Real estate & rental	\$2,391,983	\$773,556	\$293,765	\$3,459,304
54 Professional- scientific & tech services	\$0	\$100,348	\$98,803	\$199,151
55 Management of companies	\$0	\$22,935	\$134,597	\$157,531
56 Administrative & waste services	\$0	\$54,772	\$132,749	\$187,521
61 Educational services	\$0	\$42,060	\$1,992	\$44,053
62 Health & social services	\$0	\$590,356	\$12	\$590,368

### BHB Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$313,604	\$73,360	\$27,530	\$414,494
72 Accommodation & food services	\$1,205,113	\$216,034	\$68,159	\$1,489,305
81 Other services	\$0	\$192,354	\$137,060	\$329,414
92 Government & non NAICs	\$1,982,587	\$27,301	\$53,978	\$2,063,866
Multiplier	1.40			

### BHB Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$344,244	\$70,063	\$114,373	\$528,680
Sub County Special Districts	\$96,426	\$19,632	\$32,051	\$148,109
County	\$15,364	\$3,128	\$5,107	\$23,599
State	\$445,822	\$82,929	\$133,070	\$661,821
Federal	\$961,269	\$113,078	\$148,077	\$1,222,424
<b>Total Tax Impact</b>	<b>\$1,863,126</b>	<b>\$288,829</b>	<b>\$432,678</b>	<b>\$2,584,633</b>

## Economic Impacts for Knox County Regional, Knox County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$8,815,600
Airport Expenditures	\$27,130,500
Airport-Related Employment	147 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$13,988,100
Total Induced Employment Impacts	96 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$41,118,600</b>
<b>Grand Total Income Impacts</b>	<b>\$13,325,300</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>243 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$1,227,900</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### RKD Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>146.6</b>	<b>57.0</b>	<b>39.0</b>	<b>242.6</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.1	0.3	0.4
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.1	0.1	0.2
23 Construction	23.1	2.8	0.4	26.3
31-33 Manufacturing	0.0	0.3	0.0	0.3
42 Wholesale Trade	0.0	1.0	0.5	1.6
44-45 Retail trade	9.4	3.7	7.3	20.4
48-49 Transportation & Warehousing	49.6	13.7	0.8	64.2
51 Information	0.0	0.9	0.6	1.5
52 Finance & insurance	0.0	3.4	1.3	4.7
53 Real estate & rental	6.0	4.8	1.6	12.4
54 Professional- scientific & tech services	0.0	4.4	2.0	6.5
55 Management of companies	0.0	1.3	0.3	1.6
56 Administrative & waste services	4.0	7.2	1.5	12.7
61 Educational services	0.0	0.3	0.9	1.2
62 Health & social services	0.0	0.0	11.2	11.2
71 Arts- entertainment & recreation	6.1	0.8	1.3	8.2
72 Accommodation & food services	28.3	7.8	4.0	40.1
81 Other services	0.0	3.1	4.3	7.4
92 Government & non NAICs	20.0	1.3	0.4	21.6
<i>Multiplier</i>	1.65			

### RKD Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$8,815,566</b>	<b>\$2,624,314</b>	<b>\$1,885,382</b>	<b>\$13,325,263</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$2,568	\$8,953	\$11,521
21 Mining	\$0	\$97	\$2	\$99
22 Utilities	\$0	\$15,846	\$10,281	\$26,128
23 Construction	\$1,263,726	\$148,910	\$20,378	\$1,433,015
31-33 Manufacturing	\$0	\$16,800	\$2,197	\$18,997
42 Wholesale Trade	\$0	\$92,943	\$43,136	\$136,079
44-45 Retail trade	\$295,087	\$168,194	\$270,619	\$733,901
48-49 Transportation & Warehousing	\$3,807,793	\$581,373	\$38,984	\$4,428,150
51 Information	\$0	\$50,257	\$34,233	\$84,490
52 Finance & insurance	\$0	\$231,304	\$88,546	\$319,850
53 Real estate & rental	\$84,174	\$111,161	\$33,694	\$229,030
54 Professional- scientific & tech services	\$0	\$224,194	\$106,159	\$330,353
55 Management of companies	\$0	\$175,280	\$39,207	\$214,486
56 Administrative & waste services	\$121,570	\$251,393	\$52,576	\$425,539
61 Educational services	\$0	\$12,802	\$36,199	\$49,001
62 Health & social services	\$0	\$27	\$718,073	\$718,100
71 Arts- entertainment & recreation	\$225,418	\$15,547	\$44,834	\$285,799
72 Accommodation & food services	\$1,159,570	\$269,911	\$137,381	\$1,566,862
81 Other services	\$0	\$142,122	\$168,821	\$310,943
92 Government & non NAICs	\$1,858,227	\$113,586	\$31,109	\$2,002,922
<i>Multiplier</i>	1.51			

### RKD Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$27,130,470</b>	<b>\$7,839,995</b>	<b>\$6,148,112</b>	<b>\$41,118,577</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$4,882	\$15,582	\$20,464
21 Mining	\$0	\$6,450	\$114	\$6,564
22 Utilities	\$0	\$160,709	\$102,875	\$263,584
23 Construction	\$4,180,000	\$578,868	\$81,212	\$4,840,079
31-33 Manufacturing	\$0	\$103,003	\$11,415	\$114,418
42 Wholesale Trade	\$0	\$294,228	\$146,209	\$440,436
44-45 Retail trade	\$702,358	\$477,609	\$808,860	\$1,988,827
48-49 Transportation & Warehousing	\$13,164,097	\$1,048,697	\$97,042	\$14,309,836
51 Information	\$0	\$289,995	\$193,281	\$483,276
52 Finance & insurance	\$0	\$862,269	\$355,328	\$1,217,597
53 Real estate & rental	\$1,298,981	\$1,107,260	\$1,495,148	\$3,901,389
54 Professional- scientific & tech services	\$0	\$580,722	\$259,661	\$840,384
55 Management of companies	\$0	\$335,627	\$75,073	\$410,700
56 Administrative & waste services	\$388,819	\$663,505	\$137,021	\$1,189,345
61 Educational services	\$0	\$24,703	\$55,789	\$80,492
62 Health & social services	\$0	\$52	\$1,327,795	\$1,327,847



**RKD Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$606,513	\$66,963	\$126,113	\$799,589
72 Accommodation & food services	\$2,477,035	\$594,128	\$389,493	\$3,460,656
81 Other services	\$0	\$272,324	\$378,888	\$651,212
92 Government & non NAICs	\$4,312,666	\$368,002	\$91,213	\$4,771,881
Multiplier	1.52			

**RKD Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$12,977	\$111,645	\$131,852	\$256,474
Sub County Special Districts	\$11,477	\$98,589	\$116,430	\$226,496
County	\$1,713	\$14,672	\$17,326	\$33,711
State	\$238,714	\$227,432	\$245,066	\$711,212
Federal	\$1,751,988	\$448,060	\$309,952	\$2,510,000
<b>Total Tax Impact</b>	<b>\$2,016,869</b>	<b>\$900,398</b>	<b>\$820,625</b>	<b>\$3,737,893</b>

## Economic Impacts for Portland International Jetport, Portland-South Portland, ME MSA

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$301,845,500
Airport Expenditures	\$654,793,700
Airport-Related Employment	7,042 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$520,672,900
Total Induced Employment Impacts	2,965 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$1,175,466,600</b>
<b>Grand Total Income Impacts</b>	<b>\$479,495,300</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>10,007 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$86,521,600</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### PWM Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>7,042.3</b>	<b>1,287.2</b>	<b>1,678.0</b>	<b>10,007.4</b>
11 Ag, Forestry, Fish & Hunting	0.0	4.8	8.9	13.7
21 Mining	0.0	0.8	0.2	0.9
22 Utilities	0.0	6.5	3.0	9.5
23 Construction	109.9	19.5	13.8	143.2
31-33 Manufacturing	0.0	11.9	6.4	18.4
42 Wholesale Trade	0.0	35.7	42.5	78.2
44-45 Retail trade	746.1	39.2	265.7	1,051.1
48-49 Transportation & Warehousing	1,779.9	157.6	49.4	1,986.9
51 Information	0.0	30.9	24.6	55.5
52 Finance & insurance	0.0	77.3	101.8	179.1
53 Real estate & rental	58.0	155.8	69.0	282.7
54 Professional- scientific & tech services	0.0	134.5	82.4	216.9
55 Management of companies	0.0	86.4	18.9	105.3
56 Administrative & waste services	38.0	190.8	78.2	307.0
61 Educational services	1.0	6.3	70.6	77.9
62 Health & social services	0.0	0.0	412.6	412.7
71 Arts- entertainment & recreation	817.6	60.5	58.8	936.9
72 Accommodation & food services	3,182.7	141.0	175.7	3,499.4
81 Other services	20.0	95.3	178.8	294.1
92 Government & non NAICs	289.0	32.5	16.6	338.1
<i>Multiplier</i>	1.42			

### PWM Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$301,845,515</b>	<b>\$79,870,333</b>	<b>\$97,779,437</b>	<b>\$479,495,285</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$86,920	\$131,619	\$218,538
21 Mining	\$0	\$30,347	\$3,631	\$33,978
22 Utilities	\$0	\$933,701	\$423,040	\$1,356,741
23 Construction	\$6,881,689	\$1,244,902	\$854,848	\$8,981,439
31-33 Manufacturing	\$0	\$791,243	\$410,675	\$1,201,918
42 Wholesale Trade	\$0	\$3,416,357	\$4,217,698	\$7,634,055
44-45 Retail trade	\$28,857,055	\$1,802,459	\$10,931,660	\$41,591,174
48-49 Transportation & Warehousing	\$70,389,257	\$8,344,117	\$2,299,443	\$81,032,817
51 Information	\$0	\$2,518,085	\$1,985,601	\$4,503,686
52 Finance & insurance	\$0	\$7,512,112	\$9,466,801	\$16,978,913
53 Real estate & rental	\$2,391,811	\$4,592,282	\$2,044,423	\$9,028,516
54 Professional- scientific & tech services	\$0	\$11,606,946	\$7,015,650	\$18,622,596
55 Management of companies	\$0	\$12,150,714	\$2,660,733	\$14,811,447
56 Administrative & waste services	\$1,588,340	\$9,717,533	\$4,113,229	\$15,419,103
61 Educational services	\$44,996	\$284,773	\$3,274,845	\$3,604,614
62 Health & social services	\$0	\$856	\$29,615,295	\$29,616,151
71 Arts- entertainment & recreation	\$23,419,359	\$849,520	\$1,492,198	\$25,761,077
72 Accommodation & food services	\$136,966,862	\$5,019,456	\$6,185,154	\$148,171,473
81 Other services	\$712,112	\$5,614,182	\$8,977,457	\$15,303,752
92 Government & non NAICs	\$30,594,033	\$3,353,828	\$1,675,435	\$35,623,296
<i>Multiplier</i>	1.59			

### PWM Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$654,793,661</b>	<b>\$226,652,325</b>	<b>\$294,020,602</b>	<b>\$1,175,466,588</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$332,366	\$522,983	\$855,350
21 Mining	\$0	\$352,913	\$86,647	\$439,560
22 Utilities	\$0	\$8,436,335	\$3,809,594	\$12,245,929
23 Construction	\$20,900,000	\$4,303,177	\$3,044,271	\$28,247,448
31-33 Manufacturing	\$0	\$3,692,752	\$2,337,218	\$6,029,970
42 Wholesale Trade	\$0	\$12,800,405	\$16,127,096	\$28,927,501
44-45 Retail trade	\$64,764,014	\$5,155,773	\$30,923,776	\$100,843,563
48-49 Transportation & Warehousing	\$147,380,501	\$15,737,345	\$5,745,514	\$168,863,360
51 Information	\$0	\$13,772,790	\$10,197,573	\$23,970,363
52 Finance & insurance	\$0	\$24,839,053	\$33,500,050	\$58,339,103
53 Real estate & rental	\$18,035,153	\$36,992,710	\$59,739,376	\$114,767,239
54 Professional- scientific & tech services	\$0	\$23,204,888	\$14,149,408	\$37,354,295
55 Management of companies	\$0	\$22,698,428	\$4,970,444	\$27,668,872
56 Administrative & waste services	\$3,700,374	\$22,579,087	\$9,134,033	\$35,413,494
61 Educational services	\$85,914	\$526,865	\$5,056,265	\$5,669,044
62 Health & social services	\$0	\$1,588	\$52,353,175	\$52,354,763

### PWM Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$72,268,625	\$4,822,617	\$4,821,048	\$81,912,290
72 Accommodation & food services	\$288,758,683	\$11,035,929	\$17,015,200	\$316,809,812
81 Other services	\$1,068,397	\$8,141,539	\$16,273,320	\$25,483,257
92 Government & non NAICs	\$37,831,999	\$7,225,765	\$4,213,611	\$49,271,375
Multiplier	1.80			

### PWM Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$18,229,566	\$4,328,821	\$7,787,092	\$30,345,479
Sub County Special Districts	\$5,421,916	\$1,287,538	\$2,315,939	\$9,025,393
County	\$968,964	\$230,084	\$413,942	\$1,612,989
State	\$27,279,595	\$6,902,502	\$11,355,646	\$45,537,742
Federal	\$49,279,130	\$14,036,903	\$16,865,092	\$80,181,126
<b>Total Tax Impact</b>	<b>\$101,179,171</b>	<b>\$26,785,849</b>	<b>\$38,737,711</b>	<b>\$166,702,730</b>

## Economic Impacts for Presque Isle International, Aroostook County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$22,293,200
Airport Expenditures	\$59,064,900
Airport-Related Employment	210 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$24,436,200
Total Induced Employment Impacts	148 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$83,501,100</b>
<b>Grand Total Income Impacts</b>	<b>\$29,443,800</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>358 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$23,621,200</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### PQI Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>209.7</b>	<b>54.7</b>	<b>93.1</b>	<b>357.6</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.2	0.8	1.0
21 Mining	0.0	0.1	0.0	0.1
22 Utilities	0.0	0.2	0.2	0.4
23 Construction	22.4	0.7	0.8	23.9
31-33 Manufacturing	10.0	0.9	0.2	11.1
42 Wholesale Trade	13.0	2.9	1.1	17.0
44-45 Retail trade	3.5	4.4	19.3	27.2
48-49 Transportation & Warehousing	93.9	11.5	2.8	108.2
51 Information	0.0	1.0	1.1	2.1
52 Finance & insurance	0.0	3.7	5.3	9.0
53 Real estate & rental	10.0	3.7	2.9	16.6
54 Professional- scientific & tech services	7.0	3.4	2.8	13.2
55 Management of companies	0.0	2.8	0.9	3.6
56 Administrative & waste services	0.0	6.4	2.8	9.2
61 Educational services	3.0	0.1	2.2	5.4
62 Health & social services	0.0	0.0	28.7	28.7
71 Arts- entertainment & recreation	4.1	0.6	1.3	6.0
72 Accommodation & food services	14.9	4.4	11.1	30.4
81 Other services	0.0	5.6	7.4	13.0
92 Government & non NAICs	28.1	2.3	1.2	31.5
<i>Multiplier</i>	1.70			

### PQI Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$22,293,164</b>	<b>\$2,863,337</b>	<b>\$4,287,318</b>	<b>\$29,443,818</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$9,801	\$35,988	\$45,789
21 Mining	\$0	\$631	\$33	\$665
22 Utilities	\$0	\$17,434	\$26,663	\$44,098
23 Construction	\$1,032,126	\$31,179	\$33,825	\$1,097,131
31-33 Manufacturing	\$753,577	\$90,578	\$15,934	\$860,089
42 Wholesale Trade	\$853,350	\$227,507	\$85,810	\$1,166,667
44-45 Retail trade	\$106,047	\$190,467	\$676,228	\$972,742
48-49 Transportation & Warehousing	\$15,708,895	\$793,703	\$169,874	\$16,672,472
51 Information	\$0	\$54,308	\$59,639	\$113,947
52 Finance & insurance	\$0	\$212,077	\$299,655	\$511,732
53 Real estate & rental	\$398,597	\$111,457	\$77,747	\$587,802
54 Professional- scientific & tech services	\$537,713	\$164,901	\$132,987	\$835,601
55 Management of companies	\$0	\$182,531	\$55,892	\$238,423
56 Administrative & waste services	\$0	\$190,443	\$86,755	\$277,197
61 Educational services	\$91,329	\$4,166	\$74,249	\$169,744
62 Health & social services	\$0	\$5	\$1,748,447	\$1,748,451
71 Arts- entertainment & recreation	\$84,362	\$3,737	\$23,945	\$112,045
72 Accommodation & food services	\$522,651	\$136,517	\$288,490	\$947,659
81 Other services	\$0	\$272,294	\$305,802	\$578,095
92 Government & non NAICs	\$2,204,515	\$169,599	\$89,354	\$2,463,468
<i>Multiplier</i>	1.32			

### PQI Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$59,064,854</b>	<b>\$8,974,547</b>	<b>\$15,461,660</b>	<b>\$83,501,061</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$16,430	\$91,416	\$107,846
21 Mining	\$0	\$15,884	\$1,782	\$17,667
22 Utilities	\$0	\$206,289	\$311,582	\$517,872
23 Construction	\$3,877,754	\$141,639	\$156,559	\$4,175,952
31-33 Manufacturing	\$5,562,087	\$348,349	\$111,037	\$6,021,473
42 Wholesale Trade	\$19,169,775	\$973,098	\$378,504	\$20,521,377
44-45 Retail trade	\$269,189	\$558,344	\$2,103,937	\$2,931,470
48-49 Transportation & Warehousing	\$21,792,053	\$1,406,920	\$406,023	\$23,604,997
51 Information	\$0	\$473,873	\$477,806	\$951,680
52 Finance & insurance	\$0	\$1,152,185	\$1,746,292	\$2,898,478
53 Real estate & rental	\$2,562,525	\$864,006	\$3,583,143	\$7,009,674
54 Professional- scientific & tech services	\$1,481,210	\$469,412	\$361,139	\$2,311,762
55 Management of companies	\$0	\$491,027	\$150,356	\$641,382
56 Administrative & waste services	\$0	\$559,523	\$262,645	\$822,168
61 Educational services	\$216,257	\$9,667	\$123,677	\$349,601
62 Health & social services	\$0	\$12	\$3,204,228	\$3,204,241

**PQI Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$307,968	\$35,526	\$97,127	\$440,620
72 Accommodation & food services	\$1,183,452	\$321,810	\$969,663	\$2,474,925
81 Other services	\$0	\$466,843	\$618,679	\$1,085,522
92 Government & non NAICs	\$2,642,584	\$463,707	\$306,063	\$3,412,354
Multiplier	1.41			

**PQI Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$6,855,879	\$171,397	\$390,461	\$7,417,737
Sub County Special Districts	\$3,048,566	\$76,148	\$173,538	\$3,298,253
County	\$634,664	\$15,853	\$36,128	\$686,646
State	\$11,113,559	\$353,356	\$751,651	\$12,218,566
Federal	(\$90,541)	\$519,734	\$771,439	\$1,200,632
<b>Total Tax Impact</b>	<b>\$21,562,128</b>	<b>\$1,136,488</b>	<b>\$2,123,217</b>	<b>\$24,821,833</b>

## Economic Impacts for Auburn/Lewiston Municipal, Lewiston-Auburn, ME MSA

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$3,795,100
Airport Expenditures	\$10,879,700
Airport-Related Employment	70 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$5,403,200
Total Induced Employment Impacts	31 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$16,282,900</b>
<b>Grand Total Income Impacts</b>	<b>\$5,506,700</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>101 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$759,800</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### LEW Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>70.0</b>	<b>15.3</b>	<b>15.7</b>	<b>101.0</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.1	0.1
21 Mining	0.0	0.1	0.0	0.1
22 Utilities	0.0	0.1	0.0	0.1
23 Construction	15.2	0.2	0.1	15.5
31-33 Manufacturing	8.0	0.3	0.1	8.4
42 Wholesale Trade	0.0	1.3	0.3	1.6
44-45 Retail trade	2.8	2.0	2.8	7.6
48-49 Transportation & Warehousing	14.4	1.7	0.6	16.7
51 Information	0.0	0.2	0.1	0.4
52 Finance & insurance	0.0	0.6	0.8	1.4
53 Real estate & rental	0.0	1.2	0.5	1.7
54 Professional- scientific & tech services	0.0	2.0	0.7	2.7
55 Management of companies	0.0	1.2	0.2	1.4
56 Administrative & waste services	1.0	2.4	0.8	4.1
61 Educational services	0.0	0.1	0.8	0.8
62 Health & social services	6.0	0.0	4.2	10.2
71 Arts- entertainment & recreation	3.3	0.4	0.4	4.1
72 Accommodation & food services	18.3	0.6	1.8	20.7
81 Other services	0.0	0.7	1.2	2.0
92 Government & non NAICs	1.0	0.3	0.2	1.5
<i>Multiplier</i>	1.44			



### LEW Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$3,795,052</b>	<b>\$885,065</b>	<b>\$826,596</b>	<b>\$5,506,714</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$602	\$1,428	\$2,029
21 Mining	\$0	\$4,418	\$49	\$4,467
22 Utilities	\$0	\$10,257	\$4,603	\$14,860
23 Construction	\$836,126	\$9,228	\$7,387	\$852,741
31-33 Manufacturing	\$858,480	\$20,763	\$5,051	\$884,294
42 Wholesale Trade	\$0	\$103,598	\$24,778	\$128,376
44-45 Retail trade	\$95,703	\$86,829	\$106,351	\$288,883
48-49 Transportation & Warehousing	\$897,745	\$122,618	\$35,160	\$1,055,524
51 Information	\$0	\$17,418	\$11,040	\$28,457
52 Finance & insurance	\$0	\$41,119	\$54,688	\$95,807
53 Real estate & rental	\$0	\$35,068	\$14,520	\$49,588
54 Professional- scientific & tech services	\$0	\$137,220	\$46,360	\$183,580
55 Management of companies	\$0	\$95,259	\$18,987	\$114,246
56 Administrative & waste services	\$31,753	\$99,281	\$32,349	\$163,382
61 Educational services	\$0	\$2,526	\$39,590	\$42,115
62 Health & social services	\$268,486	\$606	\$288,265	\$557,358
71 Arts- entertainment & recreation	\$72,685	\$3,481	\$6,303	\$82,470
72 Accommodation & food services	\$651,490	\$21,283	\$53,350	\$726,123
81 Other services	\$0	\$42,484	\$57,509	\$99,993
92 Government & non NAICs	\$82,583	\$31,008	\$18,829	\$132,420
<i>Multiplier</i>	1.45			

### LEW Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$10,879,710</b>	<b>\$2,769,153</b>	<b>\$2,634,075</b>	<b>\$16,282,938</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$1,844	\$4,039	\$5,883
21 Mining	\$0	\$40,407	\$506	\$40,913
22 Utilities	\$0	\$100,290	\$44,979	\$145,269
23 Construction	\$2,760,000	\$34,942	\$28,966	\$2,823,908
31-33 Manufacturing	\$3,868,093	\$98,118	\$24,297	\$3,990,507
42 Wholesale Trade	\$0	\$421,044	\$100,565	\$521,609
44-45 Retail trade	\$227,867	\$255,078	\$312,274	\$795,220
48-49 Transportation & Warehousing	\$1,273,892	\$258,610	\$77,049	\$1,609,551
51 Information	\$0	\$86,080	\$51,010	\$137,089
52 Finance & insurance	\$0	\$194,870	\$274,242	\$469,112
53 Real estate & rental	\$0	\$271,934	\$549,299	\$821,233
54 Professional- scientific & tech services	\$0	\$312,268	\$114,814	\$427,082
55 Management of companies	\$0	\$227,199	\$45,286	\$272,485
56 Administrative & waste services	\$101,824	\$253,449	\$81,098	\$436,371
61 Educational services	\$0	\$4,403	\$58,566	\$62,969
62 Health & social services	\$549,985	\$1,326	\$529,584	\$1,080,894

### LEW Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$260,692	\$24,959	\$25,667	\$311,319
72 Accommodation & food services	\$1,742,418	\$51,101	\$163,276	\$1,956,795
81 Other services	\$0	\$71,381	\$104,972	\$176,353
92 Government & non NAICs	\$94,938	\$59,851	\$43,585	\$198,375
Multiplier	1.50			

### LEW Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$119,273	\$54,455	\$65,696	\$239,424
Sub County Special Districts	\$33,453	\$15,284	\$18,442	\$67,179
County	\$8,115	\$3,708	\$4,474	\$16,297
State	\$235,405	\$93,070	\$108,395	\$436,870
Federal	\$621,007	\$144,426	\$134,985	\$900,417
<b>Total Tax Impact</b>	<b>\$1,017,253</b>	<b>\$310,943</b>	<b>\$331,991</b>	<b>\$1,660,187</b>

## Economic Impacts for Belfast Municipal, Waldo County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$374,900
Airport Expenditures	\$1,181,600
Airport-Related Employment	8 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$529,600
Total Induced Employment Impacts	3 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$1,711,200</b>
<b>Grand Total Income Impacts</b>	<b>\$526,500</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>11 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$64,600</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### BST Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>7.9</b>	<b>1.9</b>	<b>1.4</b>	<b>11.3</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.1
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	6.0	0.0	0.0	6.0
31-33 Manufacturing	0.0	0.1	0.0	0.1
42 Wholesale Trade	0.0	0.1	0.0	0.1
44-45 Retail trade	0.1	0.6	0.3	1.1
48-49 Transportation & Warehousing	0.7	0.2	0.1	0.9
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.1	0.1	0.1
53 Real estate & rental	0.0	0.1	0.0	0.2
54 Professional- scientific & tech services	0.0	0.1	0.1	0.2
55 Management of companies	0.0	0.1	0.0	0.1
56 Administrative & waste services	0.0	0.2	0.1	0.3
61 Educational services	0.0	0.0	0.1	0.1
62 Health & social services	0.0	0.0	0.4	0.4
71 Arts- entertainment & recreation	0.1	0.0	0.0	0.2
72 Accommodation & food services	0.5	0.0	0.1	0.7
81 Other services	0.0	0.1	0.2	0.3
92 Government & non NAICs	0.5	0.0	0.0	0.5
<i>Multiplier</i>	1.42			

### BST Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$374,888</b>	<b>\$91,289</b>	<b>\$60,348</b>	<b>\$526,526</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$234	\$313	\$547
21 Mining	\$0	\$657	\$3	\$660
22 Utilities	\$0	\$655	\$367	\$1,022
23 Construction	\$280,923	\$622	\$661	\$282,207
31-33 Manufacturing	\$0	\$7,207	\$145	\$7,352
42 Wholesale Trade	\$0	\$4,214	\$1,035	\$5,250
44-45 Retail trade	\$3,351	\$33,241	\$8,601	\$45,193
48-49 Transportation & Warehousing	\$42,586	\$10,682	\$1,750	\$55,017
51 Information	\$0	\$1,243	\$880	\$2,123
52 Finance & insurance	\$0	\$3,738	\$3,852	\$7,591
53 Real estate & rental	\$0	\$3,878	\$1,231	\$5,109
54 Professional- scientific & tech services	\$0	\$7,134	\$2,608	\$9,742
55 Management of companies	\$0	\$4,503	\$1,392	\$5,895
56 Administrative & waste services	\$0	\$6,622	\$1,879	\$8,501
61 Educational services	\$0	\$140	\$2,455	\$2,595
62 Health & social services	\$0	\$0	\$21,760	\$21,760
71 Arts- entertainment & recreation	\$3,006	\$152	\$744	\$3,902
72 Accommodation & food services	\$18,032	\$1,342	\$4,444	\$23,817
81 Other services	\$0	\$3,874	\$5,548	\$9,422
92 Government & non NAICs	\$26,990	\$1,152	\$680	\$28,822
<i>Multiplier</i>	1.40			

### BST Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,181,616</b>	<b>\$313,776</b>	<b>\$215,830</b>	<b>\$1,711,222</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$618	\$780	\$1,397
21 Mining	\$0	\$4,486	\$31	\$4,517
22 Utilities	\$0	\$7,878	\$4,335	\$12,213
23 Construction	\$1,031,379	\$2,660	\$2,883	\$1,036,921
31-33 Manufacturing	\$0	\$41,096	\$917	\$42,012
42 Wholesale Trade	\$0	\$26,560	\$5,350	\$31,910
44-45 Retail trade	\$9,145	\$89,403	\$29,990	\$128,538
48-49 Transportation & Warehousing	\$59,397	\$24,215	\$4,768	\$88,380
51 Information	\$0	\$8,251	\$5,666	\$13,917
52 Finance & insurance	\$0	\$12,567	\$11,993	\$24,560
53 Real estate & rental	\$0	\$29,880	\$55,428	\$85,308
54 Professional- scientific & tech services	\$0	\$17,718	\$7,172	\$24,890
55 Management of companies	\$0	\$11,581	\$3,579	\$15,160
56 Administrative & waste services	\$0	\$21,592	\$5,869	\$27,462
61 Educational services	\$0	\$270	\$3,650	\$3,919
62 Health & social services	\$0	\$0	\$43,139	\$43,139

**BST Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$10,463	\$1,000	\$2,705	\$14,168
72 Accommodation & food services	\$40,205	\$3,358	\$12,766	\$56,329
81 Other services	\$0	\$8,751	\$13,325	\$22,076
92 Government & non NAICs	\$31,027	\$1,893	\$1,484	\$34,404
Multiplier	1.45			

**BST Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$854	\$9,005	\$4,452	\$14,310
Sub County Special Districts	\$665	\$7,009	\$3,465	\$11,139
County	\$183	\$1,924	\$951	\$3,059
State	\$10,431	\$16,727	\$8,907	\$36,065
Federal	\$66,358	\$17,432	\$12,822	\$96,611
<b>Total Tax Impact</b>	<b>\$78,490</b>	<b>\$52,096</b>	<b>\$30,597</b>	<b>\$161,184</b>

## Economic Impacts for Bethel Regional, Oxford County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$655,700
Airport Expenditures	\$1,031,400
Airport-Related Employment	12 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$452,700
Total Induced Employment Impacts	3 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$1,484,000</b>
<b>Grand Total Income Impacts</b>	<b>\$789,400</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>15 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$97,200</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### OB1 Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>12.5</b>	<b>1.8</b>	<b>1.2</b>	<b>15.4</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	0.7	0.0	0.0	0.8
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.0	0.0	0.0
44-45 Retail trade	0.1	0.4	0.1	0.6
48-49 Transportation & Warehousing	8.2	0.0	0.4	8.6
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.1	0.1	0.1
53 Real estate & rental	0.0	0.1	0.1	0.1
54 Professional- scientific & tech services	0.0	0.1	0.1	0.1
55 Management of companies	0.0	0.0	0.0	0.1
56 Administrative & waste services	0.0	0.0	0.1	0.2
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.5	0.0	0.5
71 Arts- entertainment & recreation	0.1	0.1	0.0	0.2
72 Accommodation & food services	0.4	0.2	0.0	0.6
81 Other services	0.0	0.2	0.1	0.3
92 Government & non NAICs	3.0	0.0	0.1	3.1
<i>Multiplier</i>	1.24			

### OB1 Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$655,736</b>	<b>\$77,221</b>	<b>\$56,478</b>	<b>\$789,435</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$379	\$121	\$500
21 Mining	\$0	\$0	\$2	\$2
22 Utilities	\$0	\$489	\$322	\$811
23 Construction	\$34,146	\$877	\$1,931	\$36,953
31-33 Manufacturing	\$0	\$140	\$1,132	\$1,272
42 Wholesale Trade	\$0	\$1,139	\$912	\$2,052
44-45 Retail trade	\$3,121	\$14,003	\$3,654	\$20,778
48-49 Transportation & Warehousing	\$418,447	\$2,382	\$21,567	\$442,396
51 Information	\$0	\$1,061	\$1,101	\$2,162
52 Finance & insurance	\$0	\$3,699	\$3,464	\$7,163
53 Real estate & rental	\$0	\$1,212	\$1,234	\$2,447
54 Professional- scientific & tech services	\$0	\$3,428	\$2,722	\$6,150
55 Management of companies	\$0	\$1,373	\$4,260	\$5,633
56 Administrative & waste services	\$0	\$1,184	\$3,007	\$4,190
61 Educational services	\$0	\$2,268	\$17	\$2,285
62 Health & social services	\$0	\$26,709	\$1	\$26,709
71 Arts- entertainment & recreation	\$2,914	\$2,190	\$390	\$5,494
72 Accommodation & food services	\$15,400	\$6,246	\$1,014	\$22,660
81 Other services	\$0	\$6,688	\$4,301	\$10,989
92 Government & non NAICs	\$181,708	\$1,755	\$5,327	\$188,791
<i>Multiplier</i>	1.20			

### OB1 Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,031,355</b>	<b>\$287,961</b>	<b>\$164,726</b>	<b>\$1,484,042</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$1,494	\$403	\$1,896
21 Mining	\$0	\$4	\$24	\$28
22 Utilities	\$0	\$6,047	\$3,973	\$10,020
23 Construction	\$127,247	\$3,928	\$8,529	\$139,703
31-33 Manufacturing	\$0	\$692	\$5,711	\$6,402
42 Wholesale Trade	\$0	\$4,941	\$4,081	\$9,022
44-45 Retail trade	\$7,621	\$44,210	\$10,687	\$62,518
48-49 Transportation & Warehousing	\$645,371	\$6,076	\$39,834	\$691,280
51 Information	\$0	\$6,439	\$6,851	\$13,289
52 Finance & insurance	\$0	\$17,900	\$17,028	\$34,928
53 Real estate & rental	\$0	\$79,529	\$9,864	\$89,393
54 Professional- scientific & tech services	\$0	\$8,708	\$7,193	\$15,901
55 Management of companies	\$0	\$3,189	\$9,897	\$13,087
56 Administrative & waste services	\$0	\$4,221	\$10,373	\$14,594
61 Educational services	\$0	\$2,613	\$37	\$2,650
62 Health & social services	\$0	\$52,979	\$1	\$52,981

**OB1 Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$8,719	\$7,181	\$2,223	\$18,123
72 Accommodation & food services	\$33,504	\$18,581	\$2,483	\$54,568
81 Other services	\$0	\$13,773	\$7,521	\$21,293
92 Government & non NAICs	\$208,893	\$5,457	\$18,013	\$232,364
Multiplier	1.44			

**OB1 Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$12,859	\$1,574	\$6,378	\$20,812
Sub County Special Districts	\$15,752	\$1,928	\$7,810	\$25,491
County	\$1,280	\$157	\$635	\$2,071
State	\$33,048	\$3,760	\$12,000	\$48,808
Federal	\$114,286	\$10,118	\$12,495	\$136,899
<b>Total Tax Impact</b>	<b>\$177,225</b>	<b>\$17,537</b>	<b>\$39,318</b>	<b>\$234,080</b>



## Economic Impacts for Biddeford Municipal, Portland-South Portland, ME MSA

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$643,400
Airport Expenditures	\$1,687,800
Airport-Related Employment	11 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$1,325,300
Total Induced Employment Impacts	7 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$3,013,100</b>
<b>Grand Total Income Impacts</b>	<b>\$1,079,100</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>18 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$133,300</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### B19 Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>10.7</b>	<b>3.8</b>	<b>3.3</b>	<b>17.8</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	7.4	0.0	0.0	7.5
31-33 Manufacturing	0.0	0.0	0.2	0.2
42 Wholesale Trade	0.0	0.1	0.3	0.4
44-45 Retail trade	0.2	0.6	0.8	1.7
48-49 Transportation & Warehousing	0.4	0.1	0.3	0.7
51 Information	0.0	0.1	0.1	0.1
52 Finance & insurance	0.0	0.2	0.1	0.3
53 Real estate & rental	0.0	0.2	0.3	0.4
54 Professional- scientific & tech services	0.0	0.2	0.4	0.6
55 Management of companies	0.0	0.0	0.1	0.1
56 Administrative & waste services	0.0	0.2	0.3	0.5
61 Educational services	0.0	0.2	0.0	0.2
62 Health & social services	0.0	0.9	0.0	0.9
71 Arts- entertainment & recreation	0.3	0.1	0.0	0.4
72 Accommodation & food services	1.0	0.4	0.1	1.5
81 Other services	0.0	0.4	0.2	0.6
92 Government & non NAICs	1.5	0.0	0.0	1.6
<i>Multiplier</i>	1.66			

### B19 Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$643,355</b>	<b>\$221,848</b>	<b>\$213,890</b>	<b>\$1,079,093</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$298	\$257	\$555
21 Mining	\$0	\$8	\$1,589	\$1,598
22 Utilities	\$0	\$956	\$1,111	\$2,067
23 Construction	\$464,456	\$1,942	\$1,267	\$467,665
31-33 Manufacturing	\$0	\$932	\$13,572	\$14,504
42 Wholesale Trade	\$0	\$9,546	\$28,773	\$38,319
44-45 Retail trade	\$8,896	\$24,764	\$42,354	\$76,014
48-49 Transportation & Warehousing	\$9,735	\$5,214	\$15,211	\$30,160
51 Information	\$0	\$4,497	\$4,475	\$8,972
52 Finance & insurance	\$0	\$21,558	\$10,510	\$32,068
53 Real estate & rental	\$0	\$4,629	\$9,896	\$14,525
54 Professional- scientific & tech services	\$0	\$15,920	\$37,554	\$53,474
55 Management of companies	\$0	\$6,034	\$11,875	\$17,909
56 Administrative & waste services	\$0	\$9,332	\$17,260	\$26,592
61 Educational services	\$0	\$7,552	\$446	\$7,998
62 Health & social services	\$0	\$67,072	\$1	\$67,073
71 Arts- entertainment & recreation	\$7,346	\$3,391	\$710	\$11,448
72 Accommodation & food services	\$41,738	\$14,039	\$3,327	\$59,104
81 Other services	\$0	\$20,374	\$10,286	\$30,660
92 Government & non NAICs	\$111,184	\$3,790	\$3,416	\$118,389
<i>Multiplier</i>	1.68			

### B19 Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,687,753</b>	<b>\$667,158</b>	<b>\$658,191</b>	<b>\$3,013,101</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$1,183	\$679	\$1,862
21 Mining	\$0	\$196	\$13,826	\$14,022
22 Utilities	\$0	\$8,611	\$10,013	\$18,623
23 Construction	\$1,410,574	\$6,917	\$4,377	\$1,421,868
31-33 Manufacturing	\$0	\$5,300	\$62,066	\$67,366
42 Wholesale Trade	\$0	\$36,500	\$110,457	\$146,957
44-45 Retail trade	\$19,815	\$70,054	\$113,540	\$203,409
48-49 Transportation & Warehousing	\$19,766	\$13,032	\$39,313	\$72,111
51 Information	\$0	\$23,089	\$24,340	\$47,429
52 Finance & insurance	\$0	\$76,208	\$35,529	\$111,737
53 Real estate & rental	\$0	\$135,771	\$73,955	\$209,726
54 Professional- scientific & tech services	\$0	\$32,114	\$72,288	\$104,402
55 Management of companies	\$0	\$11,272	\$22,183	\$33,455
56 Administrative & waste services	\$0	\$20,723	\$40,178	\$60,901
61 Educational services	\$0	\$11,648	\$792	\$12,440
62 Health & social services	\$0	\$118,514	\$2	\$118,516

### B19 Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$22,669	\$10,949	\$3,592	\$37,209
72 Accommodation & food services	\$87,112	\$38,594	\$7,991	\$133,697
81 Other services	\$0	\$36,961	\$16,459	\$53,420
92 Government & non NAICs	\$127,818	\$9,523	\$6,609	\$143,950
Multiplier	1.79			

### B19 Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$2,384	\$23,043	\$17,663	\$43,090
Sub County Special Districts	\$711	\$6,853	\$5,253	\$12,817
County	\$126	\$1,225	\$939	\$2,290
State	\$18,334	\$30,962	\$25,761	\$75,057
Federal	\$113,915	\$32,644	\$38,270	\$184,830
<b>Total Tax Impact</b>	<b>\$135,471</b>	<b>\$94,727</b>	<b>\$87,886</b>	<b>\$318,084</b>

## Economic Impacts for Brunswick Executive, Portland-South Portland, ME MSA

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$5,323,600
Airport Expenditures	\$12,795,200
Airport-Related Employment	98 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$8,927,300
Total Induced Employment Impacts	51 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$21,722,400</b>
<b>Grand Total Income Impacts</b>	<b>\$8,411,300</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>149 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$1,238,500</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### BXM Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>98.4</b>	<b>21.3</b>	<b>29.4</b>	<b>149.1</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.1	0.2	0.2
21 Mining	0.0	0.1	0.0	0.1
22 Utilities	0.0	0.0	0.1	0.1
23 Construction	14.5	0.3	0.2	15.0
31-33 Manufacturing	12.0	0.5	0.1	12.6
42 Wholesale Trade	0.0	1.2	0.7	2.0
44-45 Retail trade	0.9	1.8	4.7	7.4
48-49 Transportation & Warehousing	49.4	3.9	0.9	54.2
51 Information	0.0	0.5	0.4	0.9
52 Finance & insurance	0.0	1.1	1.8	2.8
53 Real estate & rental	0.0	1.8	1.2	3.0
54 Professional- scientific & tech services	1.0	2.6	1.4	5.0
55 Management of companies	0.0	0.8	0.3	1.1
56 Administrative & waste services	0.0	3.3	1.4	4.7
61 Educational services	16.0	0.3	1.2	17.5
62 Health & social services	0.0	0.0	7.2	7.2
71 Arts- entertainment & recreation	1.0	0.3	1.0	2.4
72 Accommodation & food services	3.7	0.6	3.1	7.4
81 Other services	0.0	1.6	3.1	4.8
92 Government & non NAICs	0.0	0.4	0.3	0.7
<i>Multiplier</i>	1.51			

### BXM Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$5,323,620</b>	<b>\$1,374,093</b>	<b>\$1,713,595</b>	<b>\$8,411,308</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$851	\$2,307	\$3,158
21 Mining	\$0	\$3,213	\$64	\$3,276
22 Utilities	\$0	\$6,480	\$7,415	\$13,895
23 Construction	\$906,452	\$19,659	\$14,980	\$941,092
31-33 Manufacturing	\$741,435	\$36,715	\$7,197	\$785,347
42 Wholesale Trade	\$0	\$118,631	\$73,923	\$192,555
44-45 Retail trade	\$34,214	\$90,957	\$191,591	\$316,762
48-49 Transportation & Warehousing	\$2,644,550	\$211,345	\$40,299	\$2,896,194
51 Information	\$0	\$41,662	\$34,801	\$76,463
52 Finance & insurance	\$0	\$98,625	\$165,881	\$264,505
53 Real estate & rental	\$0	\$56,102	\$35,832	\$91,934
54 Professional- scientific & tech services	\$88,253	\$230,274	\$122,949	\$441,477
55 Management of companies	\$0	\$114,611	\$46,631	\$161,242
56 Administrative & waste services	\$0	\$171,550	\$72,085	\$243,635
61 Educational services	\$719,932	\$12,733	\$57,352	\$790,017
62 Health & social services	\$0	\$10	\$519,051	\$519,061
71 Arts- entertainment & recreation	\$28,254	\$5,054	\$26,149	\$59,457
72 Accommodation & food services	\$160,531	\$21,262	\$108,394	\$290,186
81 Other services	\$0	\$88,316	\$157,329	\$245,645
92 Government & non NAICs	\$0	\$46,042	\$29,366	\$75,408
<i>Multiplier</i>	1.58			

### BXM Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$12,795,165</b>	<b>\$3,774,548</b>	<b>\$5,152,720</b>	<b>\$21,722,433</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$2,658	\$9,167	\$11,825
21 Mining	\$0	\$28,708	\$1,519	\$30,226
22 Utilities	\$0	\$58,643	\$66,774	\$125,418
23 Construction	\$2,752,935	\$67,964	\$53,348	\$2,874,247
31-33 Manufacturing	\$4,096,786	\$166,655	\$40,961	\$4,304,402
42 Wholesale Trade	\$0	\$448,006	\$282,659	\$730,665
44-45 Retail trade	\$76,210	\$247,151	\$541,978	\$865,338
48-49 Transportation & Warehousing	\$3,911,179	\$401,089	\$100,692	\$4,412,960
51 Information	\$0	\$233,272	\$178,729	\$412,001
52 Finance & insurance	\$0	\$343,128	\$587,026	\$930,154
53 Real estate & rental	\$0	\$434,232	\$1,046,863	\$1,481,095
54 Professional- scientific & tech services	\$161,194	\$409,163	\$247,966	\$818,323
55 Management of companies	\$0	\$214,102	\$87,109	\$301,211
56 Administrative & waste services	\$0	\$382,484	\$160,075	\$542,559
61 Educational services	\$1,374,628	\$24,111	\$88,554	\$1,487,292
62 Health & social services	\$0	\$19	\$917,583	\$917,602

**BXM Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$87,188	\$26,300	\$84,486	\$197,974
72 Accommodation & food services	\$335,045	\$51,412	\$298,197	\$684,654
81 Other services	\$0	\$120,019	\$285,179	\$405,198
92 Government & non NAICs	\$0	\$115,433	\$73,856	\$189,289
Multiplier	1.70			

**BXM Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$198,788	\$88,616	\$136,471	\$423,875
Sub County Special Districts	\$59,134	\$26,356	\$40,588	\$126,078
County	\$10,564	\$4,710	\$7,254	\$22,529
State	\$333,914	\$133,047	\$199,010	\$665,971
Federal	\$882,905	\$231,947	\$295,561	\$1,410,412
<b>Total Tax Impact</b>	<b>\$1,485,305</b>	<b>\$484,676</b>	<b>\$678,884</b>	<b>\$2,648,865</b>

## Economic Impacts for Caribou Municipal, Aroostook County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$375,200
Airport Expenditures	\$1,388,600
Airport-Related Employment	8 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$813,400
Total Induced Employment Impacts	5 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$2,202,000</b>
<b>Grand Total Income Impacts</b>	<b>\$607,300</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>13 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$85,600</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### CAR Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>8.3</b>	<b>2.6</b>	<b>1.9</b>	<b>12.8</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.1
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	7.8	0.0	0.0	7.9
31-33 Manufacturing	0.0	0.2	0.0	0.2
42 Wholesale Trade	0.0	0.2	0.0	0.2
44-45 Retail trade	0.1	1.0	0.4	1.4
48-49 Transportation & Warehousing	0.1	0.3	0.1	0.4
51 Information	0.0	0.0	0.0	0.1
52 Finance & insurance	0.0	0.1	0.1	0.2
53 Real estate & rental	0.0	0.1	0.1	0.2
54 Professional- scientific & tech services	0.0	0.2	0.1	0.2
55 Management of companies	0.0	0.0	0.0	0.1
56 Administrative & waste services	0.0	0.2	0.1	0.2
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.0	0.6	0.6
71 Arts- entertainment & recreation	0.1	0.0	0.0	0.1
72 Accommodation & food services	0.3	0.0	0.2	0.5
81 Other services	0.0	0.1	0.2	0.3
92 Government & non NAICs	0.0	0.0	0.0	0.1
<i>Multiplier</i>	1.55			

### CAR Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$375,228</b>	<b>\$144,184</b>	<b>\$87,865</b>	<b>\$607,277</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$2,048	\$737	\$2,785
21 Mining	\$0	\$206	\$1	\$206
22 Utilities	\$0	\$872	\$549	\$1,421
23 Construction	\$360,423	\$536	\$692	\$361,651
31-33 Manufacturing	\$0	\$26,983	\$327	\$27,311
42 Wholesale Trade	\$0	\$11,723	\$1,761	\$13,484
44-45 Retail trade	\$1,801	\$41,482	\$13,865	\$57,148
48-49 Transportation & Warehousing	\$2,693	\$20,422	\$3,478	\$26,593
51 Information	\$0	\$2,196	\$1,225	\$3,421
52 Finance & insurance	\$0	\$5,318	\$6,140	\$11,457
53 Real estate & rental	\$0	\$4,552	\$1,598	\$6,150
54 Professional- scientific & tech services	\$0	\$8,086	\$2,722	\$10,808
55 Management of companies	\$0	\$3,142	\$1,145	\$4,287
56 Administrative & waste services	\$0	\$5,711	\$1,776	\$7,487
61 Educational services	\$0	\$116	\$1,493	\$1,608
62 Health & social services	\$0	\$0	\$35,843	\$35,843
71 Arts- entertainment & recreation	\$1,433	\$121	\$489	\$2,043
72 Accommodation & food services	\$8,878	\$1,309	\$5,906	\$16,093
81 Other services	\$0	\$7,241	\$6,284	\$13,525
92 Government & non NAICs	\$0	\$2,121	\$1,836	\$3,956
<i>Multiplier</i>	1.62			

### CAR Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,388,598</b>	<b>\$496,702</b>	<b>\$316,660</b>	<b>\$2,201,960</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$3,248	\$1,871	\$5,118
21 Mining	\$0	\$4,702	\$37	\$4,739
22 Utilities	\$0	\$10,278	\$6,411	\$16,689
23 Construction	\$1,354,130	\$2,433	\$3,201	\$1,359,764
31-33 Manufacturing	\$0	\$97,103	\$2,281	\$99,384
42 Wholesale Trade	\$0	\$53,264	\$7,769	\$61,033
44-45 Retail trade	\$4,573	\$120,782	\$43,137	\$168,492
48-49 Transportation & Warehousing	\$4,561	\$52,231	\$8,313	\$65,105
51 Information	\$0	\$18,597	\$9,808	\$28,405
52 Finance & insurance	\$0	\$26,353	\$35,756	\$62,109
53 Real estate & rental	\$0	\$34,871	\$73,188	\$108,058
54 Professional- scientific & tech services	\$0	\$22,156	\$7,390	\$29,546
55 Management of companies	\$0	\$8,453	\$3,080	\$11,533
56 Administrative & waste services	\$0	\$18,323	\$5,377	\$23,700
61 Educational services	\$0	\$249	\$2,492	\$2,741
62 Health & social services	\$0	\$0	\$65,714	\$65,714



**CAR Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$5,231	\$1,045	\$1,986	\$8,262
72 Accommodation & food services	\$20,103	\$3,866	\$19,865	\$43,833
81 Other services	\$0	\$13,245	\$12,694	\$25,939
92 Government & non NAICs	\$0	\$5,503	\$6,294	\$11,796
Multiplier	1.59			

**CAR Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	(\$1,331)	\$15,038	\$7,998	\$21,705
Sub County Special Districts	(\$603)	\$6,684	\$3,555	\$9,636
County	(\$125)	\$1,392	\$740	\$2,006
State	\$9,197	\$27,636	\$15,396	\$52,229
Federal	\$74,055	\$22,185	\$15,808	\$112,048
<b>Total Tax Impact</b>	<b>\$81,193</b>	<b>\$72,934</b>	<b>\$43,497</b>	<b>\$197,624</b>

## Economic Impacts for Central Maine Regional, Somerset County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$221,800
Airport Expenditures	\$503,800
Airport-Related Employment	5 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$210,000
Total Induced Employment Impacts	1 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$713,800</b>
<b>Grand Total Income Impacts</b>	<b>\$281,900</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>6 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$34,200</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### OWK Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>4.5</b>	<b>0.6</b>	<b>0.6</b>	<b>5.8</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	1.4	0.0	0.0	1.5
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.0	0.0	0.0
44-45 Retail trade	0.1	0.1	0.2	0.4
48-49 Transportation & Warehousing	0.2	0.0	0.0	0.2
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.0	0.0	0.0
53 Real estate & rental	0.0	0.0	0.1	0.1
54 Professional- scientific & tech services	0.0	0.0	0.1	0.1
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.0	0.1	0.1
61 Educational services	1.0	0.0	0.0	1.0
62 Health & social services	0.0	0.2	0.0	0.2
71 Arts- entertainment & recreation	0.2	0.0	0.0	0.2
72 Accommodation & food services	0.6	0.1	0.0	0.7
81 Other services	0.0	0.0	0.0	0.1
92 Government & non NAICs	1.0	0.0	0.0	1.0
<i>Multiplier</i>	1.27			

### OWK Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$221,765</b>	<b>\$27,391</b>	<b>\$32,787</b>	<b>\$281,943</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$373	\$294	\$667
21 Mining	\$0	(\$1)	(\$3)	(\$4)
22 Utilities	\$0	\$319	\$585	\$905
23 Construction	\$89,626	\$385	\$438	\$90,449
31-33 Manufacturing	\$0	\$60	\$2,030	\$2,089
42 Wholesale Trade	\$0	\$393	\$2,078	\$2,471
44-45 Retail trade	\$4,241	\$4,296	\$6,970	\$15,508
48-49 Transportation & Warehousing	\$5,955	\$773	\$3,070	\$9,797
51 Information	\$0	\$315	\$734	\$1,049
52 Finance & insurance	\$0	\$942	\$1,899	\$2,841
53 Real estate & rental	\$0	\$472	\$2,676	\$3,148
54 Professional- scientific & tech services	\$0	\$912	\$2,966	\$3,877
55 Management of companies	\$0	\$489	\$2,162	\$2,651
56 Administrative & waste services	\$0	\$769	\$3,078	\$3,846
61 Educational services	\$39,728	\$633	\$264	\$40,625
62 Health & social services	\$0	\$11,637	\$0	\$11,637
71 Arts- entertainment & recreation	\$1,816	\$254	\$70	\$2,140
72 Accommodation & food services	\$21,170	\$1,778	\$752	\$23,700
81 Other services	\$0	\$2,114	\$1,849	\$3,963
92 Government & non NAICs	\$59,229	\$479	\$875	\$60,583
<i>Multiplier</i>	1.27			

### OWK Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$503,825</b>	<b>\$93,139</b>	<b>\$116,836</b>	<b>\$713,801</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$351	\$443	\$793
21 Mining	\$0	\$9	\$213	\$222
22 Utilities	\$0	\$3,239	\$5,993	\$9,232
23 Construction	\$271,587	\$1,348	\$1,480	\$274,414
31-33 Manufacturing	\$0	\$335	\$11,057	\$11,392
42 Wholesale Trade	\$0	\$1,944	\$8,317	\$10,260
44-45 Retail trade	\$11,050	\$13,972	\$19,798	\$44,821
48-49 Transportation & Warehousing	\$11,023	\$1,926	\$7,819	\$20,769
51 Information	\$0	\$2,007	\$5,205	\$7,212
52 Finance & insurance	\$0	\$4,364	\$8,616	\$12,980
53 Real estate & rental	\$0	\$22,990	\$19,480	\$42,470
54 Professional- scientific & tech services	\$0	\$2,187	\$6,840	\$9,027
55 Management of companies	\$0	\$1,008	\$4,458	\$5,465
56 Administrative & waste services	\$0	\$2,227	\$9,151	\$11,378
61 Educational services	\$80,851	\$731	\$537	\$82,118
62 Health & social services	\$0	\$21,870	\$0	\$21,870

### OWK Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$12,642	\$1,099	\$667	\$14,408
72 Accommodation & food services	\$48,582	\$5,791	\$1,920	\$56,292
81 Other services	\$0	\$4,228	\$2,982	\$7,210
92 Government & non NAICs	\$68,090	\$1,515	\$1,861	\$71,466
Multiplier	1.42			

### OWK Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$2,749	\$1,900	\$1,716	\$6,365
Sub County Special Districts	\$3,516	\$2,441	\$2,205	\$8,162
County	\$815	\$566	\$511	\$1,892
State	\$9,714	\$4,235	\$3,822	\$17,771
Federal	\$39,126	\$4,940	\$4,254	\$48,320
<b>Total Tax Impact</b>	<b>\$55,920</b>	<b>\$14,082</b>	<b>\$12,508</b>	<b>\$82,510</b>

## Economic Impacts for Charles A. Chase Jr. Memorial Field, Piscataquis County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$39,600
Airport Expenditures	\$83,300
Airport-Related Employment	1 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$36,800
Total Induced Employment Impacts	0 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$120,100</b>
<b>Grand Total Income Impacts</b>	<b>\$49,800</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>2 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$10,900</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### 44B Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>1.3</b>	<b>0.1</b>	<b>0.1</b>	<b>1.6</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	0.0	0.0	0.0	0.0
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.0	0.0	0.0
44-45 Retail trade	0.0	0.0	0.0	0.1
48-49 Transportation & Warehousing	1.1	0.0	0.0	1.1
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.0	0.0	0.0
53 Real estate & rental	0.0	0.0	0.0	0.0
54 Professional- scientific & tech services	0.0	0.0	0.0	0.0
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.0	0.0	0.0
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.0	0.0	0.0
71 Arts- entertainment & recreation	0.0	0.0	0.0	0.0
72 Accommodation & food services	0.2	0.0	0.0	0.2
81 Other services	0.0	0.0	0.0	0.0
92 Government & non NAICs	0.0	0.0	0.0	0.0
<i>Multiplier</i>	1.20			

#### 44B Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$39,626</b>	<b>\$5,587</b>	<b>\$4,627</b>	<b>\$49,839</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$9	\$15	\$24
21 Mining	\$0	\$1	\$0	\$1
22 Utilities	\$0	\$91	\$50	\$141
23 Construction	\$262	\$248	\$57	\$566
31-33 Manufacturing	\$0	\$40	\$11	\$51
42 Wholesale Trade	\$0	\$65	\$42	\$106
44-45 Retail trade	\$921	\$156	\$795	\$1,872
48-49 Transportation & Warehousing	\$32,759	\$1,606	\$76	\$34,440
51 Information	\$0	\$96	\$43	\$139
52 Finance & insurance	\$0	\$250	\$129	\$379
53 Real estate & rental	\$0	\$181	\$86	\$267
54 Professional- scientific & tech services	\$0	\$199	\$185	\$384
55 Management of companies	\$0	\$183	\$23	\$205
56 Administrative & waste services	\$0	\$480	\$82	\$562
61 Educational services	\$0	\$4	\$57	\$61
62 Health & social services	\$0	\$0	\$2,079	\$2,079
71 Arts- entertainment & recreation	\$826	\$9	\$56	\$891
72 Accommodation & food services	\$4,858	\$181	\$380	\$5,418
81 Other services	\$0	\$682	\$306	\$988
92 Government & non NAICs	\$0	\$1,107	\$157	\$1,264
<i>Multiplier</i>	1.26			

#### 44B Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$83,346</b>	<b>\$18,706</b>	<b>\$18,071</b>	<b>\$120,123</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$24	\$57	\$81
21 Mining	\$0	\$4	\$1	\$5
22 Utilities	\$0	\$863	\$476	\$1,339
23 Construction	\$1,022	\$1,112	\$257	\$2,392
31-33 Manufacturing	\$0	\$178	\$45	\$223
42 Wholesale Trade	\$0	\$386	\$270	\$656
44-45 Retail trade	\$2,667	\$546	\$2,648	\$5,861
48-49 Transportation & Warehousing	\$64,878	\$3,546	\$234	\$68,657
51 Information	\$0	\$548	\$240	\$788
52 Finance & insurance	\$0	\$1,386	\$744	\$2,130
53 Real estate & rental	\$0	\$1,902	\$5,101	\$7,003
54 Professional- scientific & tech services	\$0	\$527	\$541	\$1,068
55 Management of companies	\$0	\$566	\$70	\$636
56 Administrative & waste services	\$0	\$1,567	\$266	\$1,833
61 Educational services	\$0	\$10	\$137	\$147
62 Health & social services	\$0	\$0	\$4,246	\$4,246

**44B Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$3,052	\$47	\$222	\$3,321
72 Accommodation & food services	\$11,727	\$467	\$1,222	\$13,416
81 Other services	\$0	\$1,076	\$740	\$1,816
92 Government & non NAICs	\$0	\$3,952	\$552	\$4,504
Multiplier	1.44			

**44B Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$2,065	\$111	\$417	\$2,593
Sub County Special Districts	\$1,306	\$70	\$264	\$1,640
County	\$429	\$23	\$87	\$539
State	\$4,838	\$364	\$930	\$6,132
Federal	\$5,968	\$1,103	\$784	\$7,855
<b>Total Tax Impact</b>	<b>\$14,605</b>	<b>\$1,672</b>	<b>\$2,482</b>	<b>\$18,759</b>

## Economic Impacts for Dewitt Field, Old Town Municipal, Bangor, ME MSA

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$2,761,000
Airport Expenditures	\$3,904,800
Airport-Related Employment	34 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$2,395,700
Total Induced Employment Impacts	15 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$6,300,500</b>
<b>Grand Total Income Impacts</b>	<b>\$3,519,300</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>49 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$328,100</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### OLD Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>33.8</b>	<b>2.3</b>	<b>12.8</b>	<b>48.9</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.1	0.1
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.1
23 Construction	1.0	0.0	0.1	1.2
31-33 Manufacturing	0.0	0.0	0.0	0.1
42 Wholesale Trade	0.0	0.1	0.3	0.4
44-45 Retail trade	1.2	0.2	2.3	3.6
48-49 Transportation & Warehousing	4.5	0.4	0.4	5.3
51 Information	0.0	0.1	0.1	0.2
52 Finance & insurance	0.0	0.1	0.4	0.5
53 Real estate & rental	0.0	0.2	0.5	0.7
54 Professional- scientific & tech services	0.0	0.2	0.5	0.7
55 Management of companies	0.0	0.2	0.2	0.4
56 Administrative & waste services	0.0	0.4	0.6	1.0
61 Educational services	0.0	0.0	0.3	0.3
62 Health & social services	0.0	0.0	3.4	3.4
71 Arts- entertainment & recreation	1.2	0.1	0.3	1.6
72 Accommodation & food services	4.9	0.2	1.5	6.6
81 Other services	0.0	0.2	1.5	1.7
92 Government & non NAICs	21.0	0.1	0.2	21.2
<i>Multiplier</i>	1.45			



### OLD Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$2,760,988</b>	<b>\$119,402</b>	<b>\$638,867</b>	<b>\$3,519,257</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$102	\$1,107	\$1,209
21 Mining	\$0	\$24	(\$4)	\$21
22 Utilities	\$0	\$3,160	\$6,470	\$9,630
23 Construction	\$52,360	\$2,012	\$5,592	\$59,963
31-33 Manufacturing	\$0	\$2,101	\$1,223	\$3,324
42 Wholesale Trade	\$0	\$7,053	\$21,455	\$28,508
44-45 Retail trade	\$36,599	\$7,086	\$79,664	\$123,349
48-49 Transportation & Warehousing	\$208,426	\$19,633	\$19,368	\$247,427
51 Information	\$0	\$3,768	\$8,604	\$12,372
52 Finance & insurance	\$0	\$6,362	\$28,189	\$34,551
53 Real estate & rental	\$0	\$5,839	\$13,272	\$19,111
54 Professional- scientific & tech services	\$0	\$10,535	\$27,044	\$37,579
55 Management of companies	\$0	\$16,592	\$16,838	\$33,431
56 Administrative & waste services	\$0	\$13,656	\$22,483	\$36,139
61 Educational services	\$0	\$281	\$11,124	\$11,405
62 Health & social services	\$0	\$3	\$246,047	\$246,050
71 Arts- entertainment & recreation	\$31,258	\$1,024	\$6,285	\$38,567
72 Accommodation & food services	\$180,096	\$5,522	\$42,843	\$228,462
81 Other services	\$0	\$8,845	\$69,396	\$78,241
92 Government & non NAICs	\$2,252,249	\$5,803	\$11,868	\$2,269,920
<i>Multiplier</i>	1.27			

### OLD Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$3,904,779</b>	<b>\$383,237</b>	<b>\$2,012,503</b>	<b>\$6,300,519</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$226	\$3,143	\$3,369
21 Mining	\$0	\$350	\$237	\$587
22 Utilities	\$0	\$27,622	\$56,844	\$84,466
23 Construction	\$180,357	\$7,959	\$22,857	\$211,173
31-33 Manufacturing	\$0	\$10,773	\$6,313	\$17,086
42 Wholesale Trade	\$0	\$33,307	\$97,766	\$131,073
44-45 Retail trade	\$91,452	\$21,238	\$239,072	\$351,762
48-49 Transportation & Warehousing	\$328,076	\$40,665	\$52,760	\$421,501
51 Information	\$0	\$23,282	\$57,891	\$81,173
52 Finance & insurance	\$0	\$24,189	\$113,287	\$137,476
53 Real estate & rental	\$0	\$45,822	\$422,505	\$468,327
54 Professional- scientific & tech services	\$0	\$25,788	\$66,803	\$92,591
55 Management of companies	\$0	\$37,521	\$38,078	\$75,599
56 Administrative & waste services	\$0	\$36,879	\$58,553	\$95,432
61 Educational services	\$0	\$604	\$19,821	\$20,424
62 Health & social services	\$0	\$5	\$435,572	\$435,577

**OLD Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$104,626	\$6,856	\$25,693	\$137,174
72 Accommodation & food services	\$402,054	\$12,918	\$133,354	\$548,325
81 Other services	\$0	\$12,399	\$124,613	\$137,012
92 Government & non NAICs	\$2,798,215	\$14,834	\$37,342	\$2,850,392
Multiplier	1.61			

**OLD Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$26,617	\$8,065	\$49,598	\$84,279
Sub County Special Districts	\$7,258	\$2,212	\$13,606	\$23,076
County	\$2,103	\$641	\$3,942	\$6,686
State	\$106,062	\$15,291	\$92,713	\$214,066
Federal	\$521,891	\$20,099	\$109,687	\$651,677
<b>Total Tax Impact</b>	<b>\$663,931</b>	<b>\$46,308</b>	<b>\$269,546</b>	<b>\$979,784</b>

## Economic Impacts for Dexter Regional, Bangor, ME MSA

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$529,600
Airport Expenditures	\$1,483,800
Airport-Related Employment	10 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$1,074,800
Total Induced Employment Impacts	6 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$2,558,600</b>
<b>Grand Total Income Impacts</b>	<b>\$851,200</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>16 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$110,800</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### 1B0 Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>9.8</b>	<b>3.1</b>	<b>3.1</b>	<b>16.0</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	7.1	0.0	0.0	7.1
31-33 Manufacturing	0.0	0.0	0.2	0.2
42 Wholesale Trade	0.0	0.1	0.3	0.4
44-45 Retail trade	0.1	0.6	0.9	1.5
48-49 Transportation & Warehousing	0.1	0.1	0.3	0.5
51 Information	0.0	0.0	0.0	0.1
52 Finance & insurance	0.0	0.1	0.1	0.2
53 Real estate & rental	0.0	0.1	0.2	0.3
54 Professional- scientific & tech services	0.0	0.1	0.3	0.4
55 Management of companies	0.0	0.0	0.1	0.1
56 Administrative & waste services	0.0	0.1	0.3	0.5
61 Educational services	0.0	0.1	0.0	0.1
62 Health & social services	0.0	0.8	0.0	0.8
71 Arts- entertainment & recreation	0.1	0.1	0.0	0.2
72 Accommodation & food services	0.4	0.4	0.1	0.9
81 Other services	0.0	0.4	0.1	0.5
92 Government & non NAICs	2.0	0.0	0.0	2.1
<i>Multiplier</i>	1.63			

### 1B0 Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$529,560</b>	<b>\$157,302</b>	<b>\$164,323</b>	<b>\$851,185</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$272	\$222	\$494
21 Mining	\$0	(\$1)	\$2	\$1
22 Utilities	\$0	\$1,587	\$1,806	\$3,393
23 Construction	\$368,587	\$1,379	\$784	\$370,750
31-33 Manufacturing	\$0	\$301	\$11,364	\$11,665
42 Wholesale Trade	\$0	\$5,272	\$24,920	\$30,192
44-45 Retail trade	\$3,050	\$19,595	\$37,757	\$60,401
48-49 Transportation & Warehousing	\$3,940	\$4,771	\$18,678	\$27,389
51 Information	\$0	\$2,113	\$3,150	\$5,263
52 Finance & insurance	\$0	\$6,966	\$5,509	\$12,475
53 Real estate & rental	\$0	\$3,259	\$7,974	\$11,233
54 Professional- scientific & tech services	\$0	\$6,662	\$18,790	\$25,453
55 Management of companies	\$0	\$4,146	\$8,508	\$12,654
56 Administrative & waste services	\$0	\$5,539	\$11,773	\$17,313
61 Educational services	\$0	\$2,788	\$232	\$3,020
62 Health & social services	\$0	\$60,518	\$2	\$60,520
71 Arts- entertainment & recreation	\$2,605	\$1,552	\$381	\$4,538
72 Accommodation & food services	\$15,008	\$10,560	\$2,338	\$27,906
81 Other services	\$0	\$17,108	\$7,207	\$24,316
92 Government & non NAICs	\$136,371	\$2,915	\$2,925	\$142,210
<i>Multiplier</i>	1.61			

### 1B0 Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,483,842</b>	<b>\$495,682</b>	<b>\$579,096</b>	<b>\$2,558,620</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$772	\$544	\$1,316
21 Mining	\$0	\$58	\$95	\$154
22 Utilities	\$0	\$13,942	\$15,793	\$29,735
23 Construction	\$1,269,623	\$5,638	\$3,103	\$1,278,364
31-33 Manufacturing	\$0	\$1,555	\$60,655	\$62,211
42 Wholesale Trade	\$0	\$24,024	\$116,725	\$140,749
44-45 Retail trade	\$7,621	\$58,805	\$109,422	\$175,848
48-49 Transportation & Warehousing	\$7,602	\$13,002	\$51,168	\$71,772
51 Information	\$0	\$14,214	\$21,157	\$35,371
52 Finance & insurance	\$0	\$27,992	\$21,035	\$49,028
53 Real estate & rental	\$0	\$104,282	\$56,877	\$161,159
54 Professional- scientific & tech services	\$0	\$16,462	\$43,701	\$60,164
55 Management of companies	\$0	\$9,375	\$19,239	\$28,615
56 Administrative & waste services	\$0	\$14,426	\$31,715	\$46,141
61 Educational services	\$0	\$4,960	\$473	\$5,432
62 Health & social services	\$0	\$107,091	\$3	\$107,094

### 1B0 Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$8,719	\$6,339	\$2,389	\$17,448
72 Accommodation & food services	\$33,504	\$32,840	\$6,252	\$72,597
81 Other services	\$0	\$30,739	\$12,271	\$43,011
92 Government & non NAICs	\$156,773	\$9,164	\$6,476	\$172,413
Multiplier	1.72			

### 1B0 Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	(\$420)	\$19,449	\$12,209	\$31,238
Sub County Special Districts	(\$125)	\$5,337	\$3,349	\$8,561
County	(\$36)	\$1,546	\$970	\$2,481
State	\$12,115	\$33,540	\$22,824	\$68,480
Federal	\$97,680	\$24,258	\$27,013	\$148,951
<b>Total Tax Impact</b>	<b>\$109,214</b>	<b>\$84,131</b>	<b>\$66,365</b>	<b>\$259,710</b>

## Economic Impacts for Eastern Slope Regional, Oxford County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$256,000
Airport Expenditures	\$734,100
Airport-Related Employment	6 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$264,100
Total Induced Employment Impacts	2 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$998,300</b>
<b>Grand Total Income Impacts</b>	<b>\$330,400</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>7 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$35,800</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### IZG Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>5.6</b>	<b>0.8</b>	<b>0.8</b>	<b>7.2</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	3.3	0.0	0.0	3.3
31-33 Manufacturing	0.0	0.0	0.1	0.1
42 Wholesale Trade	0.0	0.0	0.0	0.1
44-45 Retail trade	0.2	0.2	0.3	0.6
48-49 Transportation & Warehousing	0.3	0.0	0.1	0.4
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.0	0.0	0.1
53 Real estate & rental	0.0	0.0	0.0	0.1
54 Professional- scientific & tech services	0.0	0.0	0.1	0.1
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.0	0.1	0.1
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.2	0.0	0.2
71 Arts- entertainment & recreation	0.2	0.0	0.0	0.2
72 Accommodation & food services	0.7	0.1	0.0	0.8
81 Other services	0.0	0.1	0.0	0.1
92 Government & non NAICs	1.0	0.0	0.0	1.0
<i>Multiplier</i>	1.29			

### IZG Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$255,975</b>	<b>\$32,874</b>	<b>\$41,573</b>	<b>\$330,421</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$161	\$171	\$332
21 Mining	\$0	\$0	\$8	\$8
22 Utilities	\$0	\$208	\$402	\$609
23 Construction	\$149,800	\$373	\$305	\$150,479
31-33 Manufacturing	\$0	\$60	\$3,256	\$3,315
42 Wholesale Trade	\$0	\$485	\$2,421	\$2,905
44-45 Retail trade	\$5,773	\$5,959	\$12,626	\$24,358
48-49 Transportation & Warehousing	\$5,951	\$1,014	\$5,749	\$12,715
51 Information	\$0	\$451	\$745	\$1,196
52 Finance & insurance	\$0	\$1,575	\$2,116	\$3,690
53 Real estate & rental	\$0	\$515	\$1,130	\$1,645
54 Professional- scientific & tech services	\$0	\$1,460	\$3,918	\$5,378
55 Management of companies	\$0	\$584	\$2,362	\$2,947
56 Administrative & waste services	\$0	\$504	\$2,002	\$2,506
61 Educational services	\$0	\$975	\$18	\$994
62 Health & social services	\$0	\$11,363	\$0	\$11,364
71 Arts- entertainment & recreation	\$5,391	\$933	\$204	\$6,529
72 Accommodation & food services	\$28,489	\$2,661	\$1,008	\$32,158
81 Other services	\$0	\$2,845	\$2,030	\$4,875
92 Government & non NAICs	\$60,569	\$746	\$1,103	\$62,418
<i>Multiplier</i>	1.29			

### IZG Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$734,148</b>	<b>\$122,614</b>	<b>\$141,513</b>	<b>\$998,276</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$635	\$417	\$1,052
21 Mining	\$0	\$2	\$63	\$65
22 Utilities	\$0	\$2,569	\$4,959	\$7,528
23 Construction	\$558,241	\$1,674	\$1,347	\$561,261
31-33 Manufacturing	\$0	\$294	\$17,041	\$17,335
42 Wholesale Trade	\$0	\$2,101	\$11,196	\$13,298
44-45 Retail trade	\$14,099	\$18,813	\$34,908	\$67,821
48-49 Transportation & Warehousing	\$14,064	\$2,588	\$14,642	\$31,294
51 Information	\$0	\$2,738	\$4,781	\$7,519
52 Finance & insurance	\$0	\$7,627	\$9,067	\$16,694
53 Real estate & rental	\$0	\$33,894	\$10,007	\$43,900
54 Professional- scientific & tech services	\$0	\$3,709	\$10,164	\$13,873
55 Management of companies	\$0	\$1,358	\$5,488	\$6,846
56 Administrative & waste services	\$0	\$1,798	\$7,345	\$9,143
61 Educational services	\$0	\$1,123	\$39	\$1,162
62 Health & social services	\$0	\$22,537	\$1	\$22,538

**IZG Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$16,130	\$3,059	\$1,163	\$20,351
72 Accommodation & food services	\$61,984	\$7,913	\$2,451	\$72,347
81 Other services	\$0	\$5,862	\$3,898	\$9,760
92 Government & non NAICs	\$69,631	\$2,320	\$2,538	\$74,489
Multiplier	1.36			

**IZG Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$1,664	\$2,874	\$2,715	\$7,253
Sub County Special Districts	\$2,040	\$3,520	\$3,325	\$8,885
County	\$166	\$286	\$270	\$722
State	\$8,397	\$5,394	\$5,109	\$18,900
Federal	\$47,446	\$6,394	\$5,320	\$59,160
<b>Total Tax Impact</b>	<b>\$59,713</b>	<b>\$18,468</b>	<b>\$16,740</b>	<b>\$94,921</b>



## Economic Impacts for Eastport Municipal, Washington County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$416,800
Airport Expenditures	\$1,596,600
Airport-Related Employment	10 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$602,700
Total Induced Employment Impacts	4 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$2,199,300</b>
<b>Grand Total Income Impacts</b>	<b>\$580,800</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>14 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$75,600</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### EPM Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>9.9</b>	<b>2.2</b>	<b>1.7</b>	<b>13.9</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	9.1	0.0	0.0	9.2
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.1	0.0	0.1
44-45 Retail trade	0.1	1.1	0.3	1.5
48-49 Transportation & Warehousing	0.1	0.2	0.0	0.4
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.1	0.1	0.1
53 Real estate & rental	0.0	0.1	0.1	0.2
54 Professional- scientific & tech services	0.0	0.2	0.0	0.2
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.2	0.1	0.2
61 Educational services	0.0	0.0	0.0	0.1
62 Health & social services	0.0	0.0	0.5	0.5
71 Arts- entertainment & recreation	0.1	0.0	0.0	0.2
72 Accommodation & food services	0.4	0.1	0.2	0.7
81 Other services	0.0	0.1	0.3	0.4
92 Government & non NAICs	0.0	0.0	0.0	0.0
<i>Multiplier</i>	1.40			

### EPM Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$416,752</b>	<b>\$97,949</b>	<b>\$66,141</b>	<b>\$580,842</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$238	\$468	\$706
21 Mining	\$0	\$616	\$4	\$620
22 Utilities	\$0	\$1,155	\$622	\$1,777
23 Construction	\$397,793	\$451	\$631	\$398,875
31-33 Manufacturing	\$0	\$3,169	\$132	\$3,301
42 Wholesale Trade	\$0	\$4,205	\$1,292	\$5,497
44-45 Retail trade	\$2,530	\$46,258	\$10,942	\$59,730
48-49 Transportation & Warehousing	\$3,086	\$11,212	\$1,807	\$16,104
51 Information	\$0	\$1,339	\$665	\$2,004
52 Finance & insurance	\$0	\$5,091	\$3,238	\$8,329
53 Real estate & rental	\$0	\$1,989	\$747	\$2,736
54 Professional- scientific & tech services	\$0	\$6,882	\$2,158	\$9,039
55 Management of companies	\$0	\$3,718	\$1,184	\$4,903
56 Administrative & waste services	\$0	\$4,923	\$1,243	\$6,166
61 Educational services	\$0	\$248	\$1,844	\$2,092
62 Health & social services	\$0	\$1	\$26,872	\$26,873
71 Arts- entertainment & recreation	\$1,622	\$137	\$299	\$2,058
72 Accommodation & food services	\$11,722	\$1,307	\$4,698	\$17,726
81 Other services	\$0	\$3,760	\$6,527	\$10,287
92 Government & non NAICs	\$0	\$1,253	\$769	\$2,022
<i>Multiplier</i>	1.39			

### EPM Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,596,591</b>	<b>\$350,179</b>	<b>\$252,503</b>	<b>\$2,199,273</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$467	\$841	\$1,308
21 Mining	\$0	\$3,829	\$26	\$3,854
22 Utilities	\$0	\$13,390	\$7,165	\$20,556
23 Construction	\$1,544,889	\$2,043	\$2,938	\$1,549,870
31-33 Manufacturing	\$0	\$22,142	\$813	\$22,955
42 Wholesale Trade	\$0	\$20,021	\$5,439	\$25,460
44-45 Retail trade	\$6,859	\$135,989	\$36,920	\$179,767
48-49 Transportation & Warehousing	\$6,842	\$29,917	\$4,564	\$41,322
51 Information	\$0	\$15,447	\$7,257	\$22,704
52 Finance & insurance	\$0	\$22,408	\$15,235	\$37,643
53 Real estate & rental	\$0	\$26,486	\$65,480	\$91,966
54 Professional- scientific & tech services	\$0	\$17,801	\$5,451	\$23,252
55 Management of companies	\$0	\$7,547	\$2,404	\$9,950
56 Administrative & waste services	\$0	\$16,469	\$4,224	\$20,693
61 Educational services	\$0	\$463	\$3,203	\$3,665
62 Health & social services	\$0	\$2	\$52,955	\$52,957

**EPM Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$7,847	\$950	\$1,708	\$10,505
72 Accommodation & food services	\$30,154	\$3,820	\$15,786	\$49,760
81 Other services	\$0	\$8,766	\$18,143	\$26,910
92 Government & non NAICs	\$0	\$2,222	\$1,952	\$4,175
Multiplier	1.38			

**EPM Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	(\$1,335)	\$15,038	\$8,513	\$22,216
Sub County Special Districts	(\$289)	\$3,195	\$1,808	\$4,715
County	(\$189)	\$2,096	\$1,186	\$3,094
State	\$10,346	\$22,118	\$13,148	\$45,612
Federal	\$78,675	\$13,969	\$11,447	\$104,091
<b>Total Tax Impact</b>	<b>\$87,209</b>	<b>\$56,416</b>	<b>\$36,102</b>	<b>\$179,727</b>

## Economic Impacts for Greenville Municipal, Piscataquis County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$139,500
Airport Expenditures	\$403,700
Airport-Related Employment	5 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$156,400
Total Induced Employment Impacts	1 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$560,100</b>
<b>Grand Total Income Impacts</b>	<b>\$180,100</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>6 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$39,100</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### 3B1 Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>4.5</b>	<b>0.6</b>	<b>0.4</b>	<b>5.6</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	1.0	0.0	0.0	1.0
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.0	0.0	0.0
44-45 Retail trade	0.3	0.1	0.1	0.5
48-49 Transportation & Warehousing	1.5	0.1	0.0	1.6
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.0	0.0	0.0
53 Real estate & rental	0.0	0.1	0.0	0.1
54 Professional- scientific & tech services	0.0	0.0	0.0	0.0
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.1	0.0	0.1
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.0	0.1	0.1
71 Arts- entertainment & recreation	0.3	0.0	0.0	0.4
72 Accommodation & food services	1.4	0.0	0.1	1.4
81 Other services	0.0	0.0	0.0	0.1
92 Government & non NAICs	0.0	0.0	0.0	0.0
<i>Multiplier</i>	1.22			

### 3B1 Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$139,491</b>	<b>\$24,304</b>	<b>\$16,342</b>	<b>\$180,137</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$104	\$52	\$157
21 Mining	\$0	\$44	\$0	\$45
22 Utilities	\$0	\$638	\$178	\$816
23 Construction	\$43,285	\$538	\$200	\$44,023
31-33 Manufacturing	\$0	\$1,944	\$38	\$1,982
42 Wholesale Trade	\$0	\$787	\$147	\$934
44-45 Retail trade	\$7,896	\$5,283	\$2,807	\$15,986
48-49 Transportation & Warehousing	\$39,592	\$2,984	\$268	\$42,844
51 Information	\$0	\$403	\$151	\$554
52 Finance & insurance	\$0	\$918	\$454	\$1,372
53 Real estate & rental	\$0	\$1,198	\$303	\$1,501
54 Professional- scientific & tech services	\$0	\$1,172	\$654	\$1,826
55 Management of companies	\$0	\$830	\$80	\$909
56 Administrative & waste services	\$0	\$1,945	\$289	\$2,234
61 Educational services	\$0	\$32	\$200	\$232
62 Health & social services	\$0	\$0	\$7,346	\$7,346
71 Arts- entertainment & recreation	\$7,081	\$63	\$198	\$7,342
72 Accommodation & food services	\$41,638	\$1,141	\$1,339	\$44,118
81 Other services	\$0	\$1,894	\$1,081	\$2,975
92 Government & non NAICs	\$0	\$2,386	\$556	\$2,942
<i>Multiplier</i>	1.29			

### 3B1 Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$403,700</b>	<b>\$92,667</b>	<b>\$63,781</b>	<b>\$560,147</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$254	\$200	\$454
21 Mining	\$0	\$250	\$2	\$252
22 Utilities	\$0	\$6,059	\$1,684	\$7,743
23 Construction	\$169,143	\$2,414	\$908	\$172,465
31-33 Manufacturing	\$0	\$8,896	\$160	\$9,055
42 Wholesale Trade	\$0	\$4,987	\$956	\$5,943
44-45 Retail trade	\$22,863	\$16,040	\$9,354	\$48,257
48-49 Transportation & Warehousing	\$85,024	\$7,485	\$825	\$93,334
51 Information	\$0	\$2,128	\$849	\$2,978
52 Finance & insurance	\$0	\$4,769	\$2,622	\$7,391
53 Real estate & rental	\$0	\$13,285	\$17,978	\$31,263
54 Professional- scientific & tech services	\$0	\$3,227	\$1,907	\$5,134
55 Management of companies	\$0	\$2,574	\$247	\$2,821
56 Administrative & waste services	\$0	\$6,425	\$938	\$7,363
61 Educational services	\$0	\$78	\$480	\$558
62 Health & social services	\$0	\$1	\$15,006	\$15,007

### 3B1 Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$26,156	\$336	\$784	\$27,277
72 Accommodation & food services	\$100,513	\$2,854	\$4,310	\$107,678
81 Other services	\$0	\$3,364	\$2,614	\$5,978
92 Government & non NAICs	\$0	\$7,240	\$1,955	\$9,195
Multiplier	1.39			

### 3B1 Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$6,052	\$1,755	\$1,473	\$9,279
Sub County Special Districts	\$3,828	\$1,110	\$932	\$5,870
County	\$1,257	\$365	\$306	\$1,928
State	\$14,827	\$3,960	\$3,284	\$22,071
Federal	\$23,267	\$3,893	\$2,769	\$29,928
<b>Total Tax Impact</b>	<b>\$49,231</b>	<b>\$11,082</b>	<b>\$8,763</b>	<b>\$69,076</b>

## Economic Impacts for Houlton International, Aroostook County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$530,500
Airport Expenditures	\$1,564,600
Airport-Related Employment	11 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$920,300
Total Induced Employment Impacts	5 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$2,484,900</b>
<b>Grand Total Income Impacts</b>	<b>\$793,400</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>16 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$113,700</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### HUL Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>11.1</b>	<b>2.5</b>	<b>2.7</b>	<b>16.3</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.1
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	7.2	0.0	0.0	7.3
31-33 Manufacturing	0.0	0.0	0.2	0.2
42 Wholesale Trade	0.0	0.0	0.1	0.2
44-45 Retail trade	0.2	0.5	0.9	1.7
48-49 Transportation & Warehousing	1.3	0.1	0.3	1.7
51 Information	0.0	0.0	0.0	0.1
52 Finance & insurance	0.0	0.1	0.1	0.2
53 Real estate & rental	0.0	0.1	0.2	0.2
54 Professional- scientific & tech services	0.0	0.1	0.2	0.3
55 Management of companies	0.0	0.0	0.1	0.1
56 Administrative & waste services	0.0	0.1	0.2	0.3
61 Educational services	0.0	0.1	0.0	0.1
62 Health & social services	0.0	0.8	0.0	0.8
71 Arts- entertainment & recreation	0.3	0.0	0.0	0.3
72 Accommodation & food services	1.1	0.3	0.1	1.4
81 Other services	0.0	0.2	0.2	0.4
92 Government & non NAICs	1.0	0.0	0.0	1.1
<i>Multiplier</i>	1.47			

### HUL Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$530,491</b>	<b>\$114,551</b>	<b>\$148,323</b>	<b>\$793,365</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$961	\$1,949	\$2,909
21 Mining	\$0	\$1	\$190	\$191
22 Utilities	\$0	\$716	\$1,055	\$1,771
23 Construction	\$332,988	\$901	\$799	\$334,687
31-33 Manufacturing	\$0	\$427	\$25,054	\$25,481
42 Wholesale Trade	\$0	\$2,298	\$11,149	\$13,446
44-45 Retail trade	\$7,506	\$18,079	\$38,639	\$64,224
48-49 Transportation & Warehousing	\$85,132	\$4,532	\$23,723	\$113,387
51 Information	\$0	\$1,598	\$2,522	\$4,120
52 Finance & insurance	\$0	\$8,004	\$5,938	\$13,942
53 Real estate & rental	\$0	\$2,086	\$4,847	\$6,934
54 Professional- scientific & tech services	\$0	\$3,546	\$8,284	\$11,830
55 Management of companies	\$0	\$1,492	\$4,272	\$5,764
56 Administrative & waste services	\$0	\$2,314	\$6,589	\$8,903
61 Educational services	\$0	\$1,931	\$130	\$2,061
62 Health & social services	\$0	\$46,735	\$0	\$46,735
71 Arts- entertainment & recreation	\$5,971	\$637	\$164	\$6,772
72 Accommodation & food services	\$36,992	\$7,697	\$1,776	\$46,464
81 Other services	\$0	\$8,201	\$8,185	\$16,386
92 Government & non NAICs	\$61,903	\$2,396	\$3,057	\$67,356
<i>Multiplier</i>	1.50			

### HUL Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,564,602</b>	<b>\$412,723</b>	<b>\$507,572</b>	<b>\$2,484,897</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$2,437	\$3,107	\$5,544
21 Mining	\$0	\$48	\$4,363	\$4,411
22 Utilities	\$0	\$8,370	\$12,461	\$20,831
23 Construction	\$1,251,053	\$4,170	\$3,626	\$1,258,849
31-33 Manufacturing	\$0	\$2,977	\$90,448	\$93,425
42 Wholesale Trade	\$0	\$10,135	\$50,708	\$60,843
44-45 Retail trade	\$19,052	\$56,247	\$112,676	\$187,975
48-49 Transportation & Warehousing	\$117,774	\$10,833	\$56,517	\$185,125
51 Information	\$0	\$12,794	\$21,431	\$34,226
52 Finance & insurance	\$0	\$46,599	\$29,883	\$76,482
53 Real estate & rental	\$0	\$95,290	\$37,634	\$132,923
54 Professional- scientific & tech services	\$0	\$9,628	\$22,778	\$32,406
55 Management of companies	\$0	\$4,014	\$11,492	\$15,506
56 Administrative & waste services	\$0	\$7,006	\$20,928	\$27,934
61 Educational services	\$0	\$3,226	\$282	\$3,508
62 Health & social services	\$0	\$85,695	\$0	\$85,695



**HUL Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$21,797	\$2,586	\$1,480	\$25,864
72 Accommodation & food services	\$83,761	\$25,895	\$4,946	\$114,602
81 Other services	\$0	\$16,557	\$14,551	\$31,108
92 Government & non NAICs	\$71,164	\$8,216	\$8,260	\$87,640
Multiplier	1.59			

**HUL Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$4,096	\$14,614	\$10,425	\$29,135
Sub County Special Districts	\$1,807	\$6,495	\$4,633	\$12,935
County	\$376	\$1,352	\$965	\$2,693
State	\$21,778	\$27,119	\$20,068	\$68,965
Federal	\$103,138	\$23,330	\$20,607	\$147,076
<b>Total Tax Impact</b>	<b>\$131,195</b>	<b>\$72,910</b>	<b>\$56,698</b>	<b>\$260,804</b>

## Economic Impacts for Islesboro, Waldo County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$26,100
Airport Expenditures	\$63,000
Airport-Related Employment	1 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$30,200
Total Induced Employment Impacts	0 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$93,200</b>
<b>Grand Total Income Impacts</b>	<b>\$34,500</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>1 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$7,500</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### 57B Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>0.8</b>	<b>0.1</b>	<b>0.1</b>	<b>1.0</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	0.0	0.0	0.0	0.0
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.0	0.0	0.0
44-45 Retail trade	0.1	0.0	0.0	0.1
48-49 Transportation & Warehousing	0.2	0.0	0.0	0.2
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.0	0.0	0.0
53 Real estate & rental	0.0	0.0	0.0	0.0
54 Professional- scientific & tech services	0.0	0.0	0.0	0.0
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.0	0.0	0.0
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.0	0.0	0.0
71 Arts- entertainment & recreation	0.1	0.0	0.0	0.1
72 Accommodation & food services	0.4	0.0	0.0	0.5
81 Other services	0.0	0.0	0.0	0.0
92 Government & non NAICs	0.0	0.0	0.0	0.0
<i>Multiplier</i>	1.25			

### 57B Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$26,096</b>	<b>\$4,765</b>	<b>\$3,681</b>	<b>\$34,542</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$27	\$19	\$46
21 Mining	\$0	\$1	\$0	\$1
22 Utilities	\$0	\$110	\$23	\$132
23 Construction	\$272	\$100	\$40	\$412
31-33 Manufacturing	\$0	\$35	\$9	\$44
42 Wholesale Trade	\$0	\$95	\$63	\$158
44-45 Retail trade	\$3,016	\$146	\$526	\$3,688
48-49 Transportation & Warehousing	\$3,874	\$374	\$107	\$4,355
51 Information	\$0	\$142	\$54	\$196
52 Finance & insurance	\$0	\$438	\$234	\$671
53 Real estate & rental	\$0	\$440	\$75	\$516
54 Professional- scientific & tech services	\$0	\$328	\$158	\$486
55 Management of companies	\$0	\$1,019	\$85	\$1,104
56 Administrative & waste services	\$0	\$582	\$115	\$697
61 Educational services	\$0	\$12	\$143	\$155
62 Health & social services	\$0	\$0	\$1,335	\$1,335
71 Arts- entertainment & recreation	\$2,706	\$34	\$45	\$2,785
72 Accommodation & food services	\$16,228	\$344	\$270	\$16,843
81 Other services	\$0	\$297	\$338	\$635
92 Government & non NAICs	\$0	\$241	\$42	\$283
<i>Multiplier</i>	1.32			

### 57B Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$63,042</b>	<b>\$17,039</b>	<b>\$13,142</b>	<b>\$93,223</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$50	\$48	\$98
21 Mining	\$0	\$9	\$2	\$11
22 Utilities	\$0	\$1,349	\$267	\$1,616
23 Construction	\$1,000	\$425	\$174	\$1,600
31-33 Manufacturing	\$0	\$187	\$56	\$243
42 Wholesale Trade	\$0	\$513	\$328	\$841
44-45 Retail trade	\$8,231	\$483	\$1,834	\$10,548
48-49 Transportation & Warehousing	\$8,210	\$772	\$291	\$9,273
51 Information	\$0	\$890	\$348	\$1,237
52 Finance & insurance	\$0	\$1,518	\$728	\$2,246
53 Real estate & rental	\$0	\$3,482	\$3,351	\$6,833
54 Professional- scientific & tech services	\$0	\$879	\$435	\$1,314
55 Management of companies	\$0	\$2,620	\$219	\$2,839
56 Administrative & waste services	\$0	\$1,875	\$358	\$2,233
61 Educational services	\$0	\$24	\$213	\$237
62 Health & social services	\$0	\$0	\$2,647	\$2,647

**57B Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$9,416	\$253	\$164	\$9,834
72 Accommodation & food services	\$36,185	\$767	\$778	\$37,730
81 Other services	\$0	\$596	\$811	\$1,407
92 Government & non NAICs	\$0	\$345	\$91	\$436
Multiplier	1.48			

**57B Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$1,367	\$231	\$271	\$1,869
Sub County Special Districts	\$1,064	\$180	\$211	\$1,455
County	\$292	\$49	\$58	\$399
State	\$2,785	\$493	\$542	\$3,820
Federal	\$5,134	\$960	\$781	\$6,875
<b>Total Tax Impact</b>	<b>\$10,642</b>	<b>\$1,914</b>	<b>\$1,864</b>	<b>\$14,419</b>

## Economic Impacts for Lincoln Regional, Bangor, ME MSA

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$1,238,400
Airport Expenditures	\$3,488,100
Airport-Related Employment	18 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$1,823,700
Total Induced Employment Impacts	11 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$5,311,800</b>
<b>Grand Total Income Impacts</b>	<b>\$1,812,600</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>29 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$225,300</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### LRG Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>18.0</b>	<b>4.3</b>	<b>6.6</b>	<b>28.9</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.1
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.1
23 Construction	4.8	0.0	0.1	4.9
31-33 Manufacturing	10.0	0.1	0.0	10.1
42 Wholesale Trade	0.0	0.6	0.1	0.7
44-45 Retail trade	0.0	0.6	1.2	1.8
48-49 Transportation & Warehousing	1.0	0.4	0.2	1.7
51 Information	0.0	0.1	0.1	0.1
52 Finance & insurance	0.0	0.1	0.2	0.3
53 Real estate & rental	0.0	0.2	0.2	0.4
54 Professional- scientific & tech services	0.0	0.6	0.2	0.9
55 Management of companies	0.0	0.3	0.1	0.4
56 Administrative & waste services	0.0	0.8	0.3	1.1
61 Educational services	0.0	0.0	0.2	0.2
62 Health & social services	0.0	0.0	1.8	1.8
71 Arts- entertainment & recreation	0.0	0.0	0.2	0.2
72 Accommodation & food services	0.1	0.1	0.8	1.0
81 Other services	0.0	0.2	0.8	1.0
92 Government & non NAICs	2.0	0.1	0.1	2.1
<i>Multiplier</i>	1.60			

### LRG Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,238,414</b>	<b>\$243,396</b>	<b>\$330,785</b>	<b>\$1,812,594</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$160	\$573	\$732
21 Mining	\$0	\$0	(\$2)	(\$2)
22 Utilities	\$0	\$4,151	\$3,346	\$7,497
23 Construction	\$251,824	\$1,423	\$2,897	\$256,144
31-33 Manufacturing	\$790,106	\$8,703	\$633	\$799,442
42 Wholesale Trade	\$0	\$43,765	\$11,102	\$54,867
44-45 Retail trade	\$793	\$26,604	\$41,234	\$68,631
48-49 Transportation & Warehousing	\$54,741	\$25,428	\$10,030	\$90,198
51 Information	\$0	\$4,349	\$4,451	\$8,800
52 Finance & insurance	\$0	\$7,893	\$14,612	\$22,505
53 Real estate & rental	\$0	\$7,599	\$6,866	\$14,465
54 Professional- scientific & tech services	\$0	\$37,107	\$14,005	\$51,112
55 Management of companies	\$0	\$29,088	\$8,718	\$37,806
56 Administrative & waste services	\$0	\$29,993	\$11,643	\$41,636
61 Educational services	\$0	\$239	\$5,792	\$6,030
62 Health & social services	\$0	\$8	\$127,353	\$127,361
71 Arts- entertainment & recreation	\$677	\$552	\$3,257	\$4,486
72 Accommodation & food services	\$3,902	\$3,010	\$22,190	\$29,102
81 Other services	\$0	\$8,784	\$35,945	\$44,730
92 Government & non NAICs	\$136,371	\$4,540	\$6,140	\$147,051
<i>Multiplier</i>	1.46			

### LRG Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$3,488,105</b>	<b>\$781,627</b>	<b>\$1,042,117</b>	<b>\$5,311,849</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$389	\$1,626	\$2,015
21 Mining	\$0	\$110	\$123	\$233
22 Utilities	\$0	\$36,260	\$29,396	\$65,656
23 Construction	\$867,426	\$5,629	\$11,841	\$884,896
31-33 Manufacturing	\$2,370,020	\$44,955	\$3,269	\$2,418,245
42 Wholesale Trade	\$0	\$184,706	\$50,589	\$235,295
44-45 Retail trade	\$1,981	\$77,166	\$123,745	\$202,892
48-49 Transportation & Warehousing	\$80,926	\$66,128	\$27,325	\$174,379
51 Information	\$0	\$29,882	\$29,948	\$59,830
52 Finance & insurance	\$0	\$30,089	\$58,721	\$88,811
53 Real estate & rental	\$0	\$55,433	\$218,927	\$274,360
54 Professional- scientific & tech services	\$0	\$71,278	\$34,598	\$105,876
55 Management of companies	\$0	\$65,778	\$19,715	\$85,493
56 Administrative & waste services	\$0	\$75,863	\$30,323	\$106,186
61 Educational services	\$0	\$490	\$10,315	\$10,805
62 Health & social services	\$0	\$14	\$225,422	\$225,436

**LRG Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$2,267	\$3,417	\$13,312	\$18,995
72 Accommodation & food services	\$8,711	\$8,214	\$69,050	\$85,975
81 Other services	\$0	\$14,505	\$64,558	\$79,064
92 Government & non NAICs	\$156,773	\$11,320	\$19,315	\$187,408
Multiplier	1.52			

**LRG Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$18,132	\$19,632	\$25,678	\$63,442
Sub County Special Districts	\$4,956	\$5,386	\$7,044	\$17,386
County	\$1,436	\$1,560	\$2,041	\$5,037
State	\$55,617	\$35,843	\$48,001	\$139,462
Federal	\$224,463	\$39,565	\$56,796	\$320,824
<b>Total Tax Impact</b>	<b>\$304,604</b>	<b>\$101,987</b>	<b>\$139,560</b>	<b>\$546,151</b>

## Economic Impacts for Machias Valley Municipal, Washington County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$253,900
Airport Expenditures	\$829,200
Airport-Related Employment	6 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$314,000
Total Induced Employment Impacts	2 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$1,143,200</b>
<b>Grand Total Income Impacts</b>	<b>\$339,100</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>8 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$39,600</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### MVM Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>5.7</b>	<b>1.0</b>	<b>1.1</b>	<b>7.7</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	4.4	0.0	0.0	4.4
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.0	0.0	0.0
44-45 Retail trade	0.0	0.2	0.5	0.8
48-49 Transportation & Warehousing	0.0	0.0	0.1	0.2
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.0	0.0	0.1
53 Real estate & rental	0.0	0.0	0.1	0.1
54 Professional- scientific & tech services	0.0	0.0	0.1	0.1
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.0	0.1	0.1
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.3	0.0	0.3
71 Arts- entertainment & recreation	0.0	0.0	0.0	0.1
72 Accommodation & food services	0.1	0.1	0.0	0.3
81 Other services	0.0	0.1	0.1	0.2
92 Government & non NAICs	1.0	0.0	0.0	1.0
<i>Multiplier</i>	1.36			



### MVM Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$253,867</b>	<b>\$38,254</b>	<b>\$46,996</b>	<b>\$339,118</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$271	\$109	\$380
21 Mining	\$0	\$2	\$298	\$301
22 Utilities	\$0	\$361	\$538	\$898
23 Construction	\$192,895	\$365	\$208	\$193,468
31-33 Manufacturing	\$0	\$77	\$1,532	\$1,608
42 Wholesale Trade	\$0	\$748	\$2,027	\$2,775
44-45 Retail trade	\$843	\$6,331	\$22,416	\$29,591
48-49 Transportation & Warehousing	\$1,029	\$1,045	\$5,374	\$7,448
51 Information	\$0	\$385	\$636	\$1,021
52 Finance & insurance	\$0	\$1,874	\$2,428	\$4,302
53 Real estate & rental	\$0	\$433	\$955	\$1,388
54 Professional- scientific & tech services	\$0	\$1,248	\$3,292	\$4,540
55 Management of companies	\$0	\$685	\$1,702	\$2,387
56 Administrative & waste services	\$0	\$719	\$2,346	\$3,064
61 Educational services	\$0	\$1,060	\$116	\$1,175
62 Health & social services	\$0	\$15,546	\$0	\$15,547
71 Arts- entertainment & recreation	\$541	\$173	\$61	\$775
72 Accommodation & food services	\$3,907	\$2,715	\$592	\$7,215
81 Other services	\$0	\$3,772	\$1,792	\$5,565
92 Government & non NAICs	\$54,653	\$445	\$574	\$55,671
<i>Multiplier</i>	1.34			

### MVM Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$829,200</b>	<b>\$146,010</b>	<b>\$168,029</b>	<b>\$1,143,239</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$487	\$218	\$704
21 Mining	\$0	\$15	\$1,856	\$1,871
22 Utilities	\$0	\$4,153	\$6,231	\$10,384
23 Construction	\$749,137	\$1,698	\$942	\$751,777
31-33 Manufacturing	\$0	\$470	\$10,716	\$11,186
42 Wholesale Trade	\$0	\$3,148	\$9,655	\$12,804
44-45 Retail trade	\$2,286	\$21,361	\$65,889	\$89,536
48-49 Transportation & Warehousing	\$2,281	\$2,639	\$14,382	\$19,302
51 Information	\$0	\$4,203	\$7,354	\$11,557
52 Finance & insurance	\$0	\$8,815	\$10,668	\$19,483
53 Real estate & rental	\$0	\$37,827	\$12,689	\$50,515
54 Professional- scientific & tech services	\$0	\$3,151	\$8,524	\$11,675
55 Management of companies	\$0	\$1,390	\$3,455	\$4,845
56 Administrative & waste services	\$0	\$2,442	\$7,841	\$10,283
61 Educational services	\$0	\$1,841	\$216	\$2,057
62 Health & social services	\$0	\$30,642	\$1	\$30,643

### MVM Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$2,616	\$987	\$424	\$4,027
72 Accommodation & food services	\$10,051	\$9,127	\$1,754	\$20,933
81 Other services	\$0	\$10,482	\$4,188	\$14,671
92 Government & non NAICs	\$62,829	\$1,130	\$1,025	\$64,985
Multiplier	1.38			

### MVM Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	(\$899)	\$7,257	\$4,926	\$11,283
Sub County Special Districts	(\$194)	\$1,542	\$1,047	\$2,394
County	(\$127)	\$1,011	\$686	\$1,571
State	\$6,037	\$10,665	\$7,607	\$24,309
Federal	\$49,768	\$6,682	\$6,618	\$63,067
<b>Total Tax Impact</b>	<b>\$54,585</b>	<b>\$27,156</b>	<b>\$20,884</b>	<b>\$102,625</b>

## Economic Impacts for Millinocket Municipal, Bangor, ME MSA

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$583,700
Airport Expenditures	\$1,022,900
Airport-Related Employment	11 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$797,200
Total Induced Employment Impacts	5 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$1,820,100</b>
<b>Grand Total Income Impacts</b>	<b>\$842,000</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>16 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$112,700</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### MLT Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>10.8</b>	<b>3.1</b>	<b>2.0</b>	<b>15.9</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	1.7	0.0	0.0	1.8
31-33 Manufacturing	0.0	0.0	0.0	0.1
42 Wholesale Trade	0.0	0.1	0.1	0.2
44-45 Retail trade	0.1	0.6	0.2	0.9
48-49 Transportation & Warehousing	6.2	0.1	0.5	6.8
51 Information	0.0	0.0	0.0	0.1
52 Finance & insurance	0.0	0.1	0.1	0.2
53 Real estate & rental	0.0	0.1	0.1	0.2
54 Professional- scientific & tech services	0.0	0.1	0.1	0.2
55 Management of companies	0.0	0.0	0.1	0.1
56 Administrative & waste services	0.0	0.1	0.3	0.4
61 Educational services	0.0	0.1	0.0	0.1
62 Health & social services	0.0	0.8	0.0	0.8
71 Arts- entertainment & recreation	0.1	0.1	0.0	0.2
72 Accommodation & food services	0.6	0.4	0.1	1.0
81 Other services	0.0	0.4	0.2	0.6
92 Government & non NAICs	2.0	0.0	0.1	2.1
<i>Multiplier</i>	1.47			

### MLT Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$583,684</b>	<b>\$153,756</b>	<b>\$104,594</b>	<b>\$842,034</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$266	\$85	\$351
21 Mining	\$0	(\$1)	\$2	\$1
22 Utilities	\$0	\$1,555	\$1,091	\$2,646
23 Construction	\$90,572	\$1,346	\$1,769	\$93,688
31-33 Manufacturing	\$0	\$294	\$3,003	\$3,297
42 Wholesale Trade	\$0	\$5,161	\$7,766	\$12,927
44-45 Retail trade	\$4,270	\$19,167	\$10,080	\$33,517
48-49 Transportation & Warehousing	\$327,813	\$4,662	\$28,367	\$360,842
51 Information	\$0	\$2,069	\$2,169	\$4,238
52 Finance & insurance	\$0	\$6,792	\$4,595	\$11,386
53 Real estate & rental	\$0	\$3,192	\$3,820	\$7,011
54 Professional- scientific & tech services	\$0	\$6,510	\$7,570	\$14,080
55 Management of companies	\$0	\$4,052	\$7,796	\$11,848
56 Administrative & waste services	\$0	\$5,412	\$10,967	\$16,379
61 Educational services	\$0	\$2,692	\$124	\$2,816
62 Health & social services	\$0	\$59,197	\$2	\$59,199
71 Arts- entertainment & recreation	\$3,647	\$1,514	\$399	\$5,559
72 Accommodation & food services	\$21,011	\$10,314	\$1,790	\$33,115
81 Other services	\$0	\$16,708	\$8,630	\$25,338
92 Government & non NAICs	\$136,371	\$2,854	\$4,571	\$143,795
<i>Multiplier</i>	1.44			

### MLT Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,022,879</b>	<b>\$484,398</b>	<b>\$312,810</b>	<b>\$1,820,087</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$756	\$199	\$955
21 Mining	\$0	\$57	\$87	\$144
22 Utilities	\$0	\$13,665	\$9,564	\$23,229
23 Construction	\$311,982	\$5,504	\$7,002	\$324,488
31-33 Manufacturing	\$0	\$1,520	\$15,979	\$17,498
42 Wholesale Trade	\$0	\$23,515	\$38,110	\$61,625
44-45 Retail trade	\$10,669	\$57,520	\$29,671	\$97,860
48-49 Transportation & Warehousing	\$484,342	\$12,701	\$56,181	\$553,224
51 Information	\$0	\$13,921	\$14,097	\$28,018
52 Finance & insurance	\$0	\$27,294	\$17,611	\$44,905
53 Real estate & rental	\$0	\$101,759	\$27,209	\$128,968
54 Professional- scientific & tech services	\$0	\$16,082	\$17,919	\$34,001
55 Management of companies	\$0	\$9,164	\$17,629	\$26,793
56 Administrative & waste services	\$0	\$14,095	\$28,280	\$42,375
61 Educational services	\$0	\$4,794	\$259	\$5,053
62 Health & social services	\$0	\$104,783	\$3	\$104,786

**MLT Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$12,206	\$6,187	\$2,632	\$21,025
72 Accommodation & food services	\$46,906	\$32,096	\$4,546	\$83,548
81 Other services	\$0	\$30,008	\$11,544	\$41,551
92 Government & non NAICs	\$156,773	\$8,978	\$14,290	\$180,041
Multiplier	1.78			

**MLT Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$12,820	\$7,879	\$11,936	\$32,635
Sub County Special Districts	\$3,509	\$2,161	\$3,274	\$8,945
County	\$1,017	\$626	\$949	\$2,592
State	\$31,764	\$14,477	\$22,312	\$68,553
Federal	\$101,431	\$16,874	\$26,400	\$144,705
<b>Total Tax Impact</b>	<b>\$150,541</b>	<b>\$42,018</b>	<b>\$64,871</b>	<b>\$257,430</b>

## Economic Impacts for Newton Field, Somerset County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$639,900
Airport Expenditures	\$1,821,600
Airport-Related Employment	11 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$792,800
Total Induced Employment Impacts	5 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$2,614,300</b>
<b>Grand Total Income Impacts</b>	<b>\$871,900</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>15 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$81,700</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### 59B Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>10.5</b>	<b>2.0</b>	<b>2.6</b>	<b>15.1</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.1	0.1
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	9.2	0.0	0.0	9.2
31-33 Manufacturing	0.0	0.0	0.2	0.2
42 Wholesale Trade	0.0	0.0	0.2	0.2
44-45 Retail trade	0.0	0.5	0.9	1.4
48-49 Transportation & Warehousing	0.1	0.0	0.2	0.3
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.1	0.1	0.1
53 Real estate & rental	0.0	0.1	0.2	0.3
54 Professional- scientific & tech services	0.0	0.1	0.2	0.3
55 Management of companies	0.0	0.0	0.0	0.1
56 Administrative & waste services	0.0	0.1	0.2	0.3
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.6	0.0	0.6
71 Arts- entertainment & recreation	0.1	0.1	0.0	0.1
72 Accommodation & food services	0.2	0.2	0.0	0.5
81 Other services	0.0	0.2	0.1	0.3
92 Government & non NAICs	1.0	0.0	0.0	1.0
<i>Multiplier</i>	1.44			

### 59B Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$639,854</b>	<b>\$91,128</b>	<b>\$140,955</b>	<b>\$871,937</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$1,237	\$1,472	\$2,709
21 Mining	\$0	(\$4)	(\$14)	(\$18)
22 Utilities	\$0	\$1,057	\$1,550	\$2,607
23 Construction	\$569,183	\$1,285	\$883	\$571,351
31-33 Manufacturing	\$0	\$198	\$12,455	\$12,653
42 Wholesale Trade	\$0	\$1,305	\$12,015	\$13,320
44-45 Retail trade	\$1,463	\$14,279	\$42,948	\$58,689
48-49 Transportation & Warehousing	\$2,053	\$2,571	\$15,944	\$20,569
51 Information	\$0	\$1,043	\$1,757	\$2,800
52 Finance & insurance	\$0	\$3,133	\$4,074	\$7,206
53 Real estate & rental	\$0	\$1,569	\$9,464	\$11,033
54 Professional- scientific & tech services	\$0	\$3,037	\$13,264	\$16,302
55 Management of companies	\$0	\$1,626	\$4,515	\$6,140
56 Administrative & waste services	\$0	\$2,558	\$9,178	\$11,735
61 Educational services	\$0	\$2,156	\$36	\$2,193
62 Health & social services	\$0	\$38,695	\$0	\$38,696
71 Arts- entertainment & recreation	\$626	\$849	\$123	\$1,597
72 Accommodation & food services	\$7,300	\$5,922	\$1,300	\$14,522
81 Other services	\$0	\$7,023	\$8,144	\$15,167
92 Government & non NAICs	\$59,229	\$1,591	\$1,848	\$62,667
<i>Multiplier</i>	1.36			

### 59B Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,821,568</b>	<b>\$310,099</b>	<b>\$482,656</b>	<b>\$2,614,323</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$1,164	\$2,320	\$3,485
21 Mining	\$0	\$29	\$1,311	\$1,340
22 Utilities	\$0	\$10,724	\$15,783	\$26,507
23 Construction	\$1,724,755	\$4,498	\$2,980	\$1,732,232
31-33 Manufacturing	\$0	\$1,112	\$67,945	\$69,057
42 Wholesale Trade	\$0	\$6,453	\$47,943	\$54,396
44-45 Retail trade	\$3,810	\$46,437	\$121,110	\$171,357
48-49 Transportation & Warehousing	\$3,801	\$6,409	\$41,848	\$52,058
51 Information	\$0	\$6,653	\$11,504	\$18,157
52 Finance & insurance	\$0	\$14,529	\$17,727	\$32,256
53 Real estate & rental	\$0	\$76,839	\$63,579	\$140,418
54 Professional- scientific & tech services	\$0	\$7,288	\$29,963	\$37,251
55 Management of companies	\$0	\$3,352	\$9,309	\$12,660
56 Administrative & waste services	\$0	\$7,411	\$27,406	\$34,816
61 Educational services	\$0	\$2,484	\$74	\$2,558
62 Health & social services	\$0	\$72,688	\$0	\$72,688

**59B Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$4,359	\$3,668	\$1,000	\$9,027
72 Accommodation & food services	\$16,752	\$19,270	\$3,661	\$39,683
81 Other services	\$0	\$14,068	\$12,982	\$27,050
92 Government & non NAICs	\$68,090	\$5,023	\$4,211	\$77,324
Multiplier	1.44			

**59B Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	(\$1,313)	\$9,346	\$5,715	\$13,749
Sub County Special Districts	(\$1,750)	\$12,008	\$7,343	\$17,602
County	(\$409)	\$2,785	\$1,703	\$4,079
State	\$13,334	\$20,199	\$12,727	\$46,261
Federal	\$116,637	\$19,976	\$14,154	\$150,768
<b>Total Tax Impact</b>	<b>\$126,501</b>	<b>\$64,313</b>	<b>\$41,643</b>	<b>\$232,457</b>



## Economic Impacts for Northern Aroostook Regional, Aroostook County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$292,600
Airport Expenditures	\$929,600
Airport-Related Employment	6 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$540,100
Total Induced Employment Impacts	3 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$1,469,800</b>
<b>Grand Total Income Impacts</b>	<b>\$446,500</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>9 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$57,300</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### FVE Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>6.1</b>	<b>1.4</b>	<b>1.6</b>	<b>9.1</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	4.9	0.0	0.0	4.9
31-33 Manufacturing	0.0	0.0	0.1	0.2
42 Wholesale Trade	0.0	0.0	0.1	0.1
44-45 Retail trade	0.0	0.3	0.6	0.9
48-49 Transportation & Warehousing	0.0	0.0	0.2	0.2
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.1	0.1	0.1
53 Real estate & rental	0.0	0.0	0.1	0.1
54 Professional- scientific & tech services	0.0	0.0	0.1	0.2
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.0	0.1	0.2
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.4	0.0	0.4
71 Arts- entertainment & recreation	0.0	0.0	0.0	0.1
72 Accommodation & food services	0.1	0.2	0.0	0.3
81 Other services	0.0	0.1	0.1	0.2
92 Government & non NAICs	1.0	0.0	0.0	1.0
<i>Multiplier</i>	1.50			

### FVE Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$292,590</b>	<b>\$64,461</b>	<b>\$89,450</b>	<b>\$446,500</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$541	\$1,275	\$1,816
21 Mining	\$0	\$1	\$128	\$129
22 Utilities	\$0	\$403	\$528	\$931
23 Construction	\$224,925	\$507	\$325	\$225,757
31-33 Manufacturing	\$0	\$241	\$16,834	\$17,074
42 Wholesale Trade	\$0	\$1,293	\$7,300	\$8,593
44-45 Retail trade	\$701	\$10,173	\$25,872	\$36,746
48-49 Transportation & Warehousing	\$1,048	\$2,550	\$12,688	\$16,286
51 Information	\$0	\$899	\$1,345	\$2,244
52 Finance & insurance	\$0	\$4,504	\$3,274	\$7,778
53 Real estate & rental	\$0	\$1,174	\$2,806	\$3,980
54 Professional- scientific & tech services	\$0	\$1,996	\$5,001	\$6,996
55 Management of companies	\$0	\$840	\$1,885	\$2,725
56 Administrative & waste services	\$0	\$1,302	\$3,511	\$4,813
61 Educational services	\$0	\$1,087	\$71	\$1,158
62 Health & social services	\$0	\$26,299	\$0	\$26,299
71 Arts- entertainment & recreation	\$558	\$358	\$72	\$988
72 Accommodation & food services	\$3,455	\$4,331	\$781	\$8,567
81 Other services	\$0	\$4,615	\$4,471	\$9,086
92 Government & non NAICs	\$61,903	\$1,348	\$1,282	\$64,533
<i>Multiplier</i>	1.53			

### FVE Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$929,634</b>	<b>\$232,253</b>	<b>\$307,895</b>	<b>\$1,469,782</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$1,371	\$2,022	\$3,394
21 Mining	\$0	\$27	\$2,934	\$2,961
22 Utilities	\$0	\$4,710	\$6,222	\$10,932
23 Construction	\$845,056	\$2,346	\$1,475	\$848,877
31-33 Manufacturing	\$0	\$1,675	\$60,565	\$62,240
42 Wholesale Trade	\$0	\$5,703	\$33,175	\$38,878
44-45 Retail trade	\$1,779	\$31,651	\$75,323	\$108,754
48-49 Transportation & Warehousing	\$1,775	\$6,096	\$32,477	\$40,349
51 Information	\$0	\$7,200	\$11,377	\$18,576
52 Finance & insurance	\$0	\$26,223	\$16,210	\$42,433
53 Real estate & rental	\$0	\$53,624	\$21,456	\$75,080
54 Professional- scientific & tech services	\$0	\$5,418	\$13,697	\$19,115
55 Management of companies	\$0	\$2,259	\$5,072	\$7,331
56 Administrative & waste services	\$0	\$3,943	\$11,266	\$15,209
61 Educational services	\$0	\$1,816	\$152	\$1,968
62 Health & social services	\$0	\$48,222	\$0	\$48,222

**FVE Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$2,036	\$1,455	\$619	\$4,111
72 Accommodation & food services	\$7,823	\$14,572	\$2,327	\$24,722
81 Other services	\$0	\$9,317	\$8,187	\$17,504
92 Government & non NAICs	\$71,164	\$4,623	\$3,338	\$79,125
Multiplier	1.58			

**FVE Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	(\$1,040)	\$9,353	\$5,866	\$14,179
Sub County Special Districts	(\$471)	\$4,157	\$2,607	\$6,293
County	(\$98)	\$865	\$543	\$1,310
State	\$7,060	\$17,180	\$11,293	\$35,533
Federal	\$59,071	\$13,745	\$11,596	\$84,412
<b>Total Tax Impact</b>	<b>\$64,522</b>	<b>\$45,300</b>	<b>\$31,906</b>	<b>\$141,728</b>

## Economic Impacts for Oxford County Regional, Oxford County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$1,022,300
Airport Expenditures	\$1,782,200
Airport-Related Employment	20 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$816,600
Total Induced Employment Impacts	5 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$2,598,800</b>
<b>Grand Total Income Impacts</b>	<b>\$1,266,400</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>26 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$177,100</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### 81B Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>20.1</b>	<b>3.0</b>	<b>2.4</b>	<b>25.5</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.1
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	2.0	0.0	0.1	2.2
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.0	0.0	0.1
44-45 Retail trade	0.1	0.7	0.2	1.0
48-49 Transportation & Warehousing	16.2	0.1	0.8	17.1
51 Information	0.0	0.0	0.0	0.1
52 Finance & insurance	0.0	0.1	0.1	0.3
53 Real estate & rental	0.0	0.1	0.1	0.2
54 Professional- scientific & tech services	0.0	0.1	0.1	0.2
55 Management of companies	0.0	0.0	0.1	0.1
56 Administrative & waste services	0.0	0.1	0.2	0.3
61 Educational services	0.0	0.1	0.0	0.1
62 Health & social services	0.0	0.8	0.0	0.8
71 Arts- entertainment & recreation	0.1	0.1	0.0	0.3
72 Accommodation & food services	0.6	0.3	0.1	1.0
81 Other services	0.0	0.3	0.2	0.5
92 Government & non NAICs	1.0	0.0	0.1	1.2
<i>Multiplier</i>	1.27			

### 81B Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,022,297</b>	<b>\$126,609</b>	<b>\$117,468</b>	<b>\$1,266,374</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$621	\$265	\$886
21 Mining	\$0	\$0	\$5	\$5
22 Utilities	\$0	\$799	\$639	\$1,438
23 Construction	\$93,920	\$1,439	\$3,851	\$99,210
31-33 Manufacturing	\$0	\$230	\$2,798	\$3,028
42 Wholesale Trade	\$0	\$1,866	\$2,196	\$4,062
44-45 Retail trade	\$4,728	\$22,947	\$9,392	\$37,067
48-49 Transportation & Warehousing	\$835,335	\$3,907	\$43,871	\$883,113
51 Information	\$0	\$1,737	\$2,239	\$3,976
52 Finance & insurance	\$0	\$6,064	\$7,058	\$13,122
53 Real estate & rental	\$0	\$1,981	\$2,556	\$4,537
54 Professional- scientific & tech services	\$0	\$5,624	\$5,890	\$11,514
55 Management of companies	\$0	\$2,251	\$8,384	\$10,635
56 Administrative & waste services	\$0	\$1,942	\$6,163	\$8,105
61 Educational services	\$0	\$3,766	\$34	\$3,800
62 Health & social services	\$0	\$43,758	\$1	\$43,760
71 Arts- entertainment & recreation	\$4,415	\$3,596	\$767	\$8,778
72 Accommodation & food services	\$23,330	\$10,250	\$1,954	\$35,534
81 Other services	\$0	\$10,956	\$8,783	\$19,739
92 Government & non NAICs	\$60,569	\$2,873	\$10,622	\$74,065
<i>Multiplier</i>	1.24			

### 81B Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,782,199</b>	<b>\$472,262</b>	<b>\$344,349</b>	<b>\$2,598,810</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$2,446	\$859	\$3,305
21 Mining	\$0	\$7	\$59	\$66
22 Utilities	\$0	\$9,890	\$7,879	\$17,770
23 Construction	\$350,000	\$6,447	\$17,011	\$373,459
31-33 Manufacturing	\$0	\$1,133	\$14,235	\$15,368
42 Wholesale Trade	\$0	\$8,092	\$9,890	\$17,981
44-45 Retail trade	\$11,546	\$72,451	\$27,086	\$111,083
48-49 Transportation & Warehousing	\$1,287,054	\$9,967	\$81,639	\$1,378,660
51 Information	\$0	\$10,544	\$13,906	\$24,450
52 Finance & insurance	\$0	\$29,382	\$34,527	\$63,909
53 Real estate & rental	\$0	\$130,574	\$20,309	\$150,883
54 Professional- scientific & tech services	\$0	\$14,287	\$15,501	\$29,789
55 Management of companies	\$0	\$5,230	\$19,479	\$24,709
56 Administrative & waste services	\$0	\$6,925	\$21,302	\$28,227
61 Educational services	\$0	\$4,335	\$73	\$4,408
62 Health & social services	\$0	\$86,783	\$2	\$86,785

### 81B Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$13,209	\$11,782	\$4,367	\$29,358
72 Accommodation & food services	\$50,759	\$30,477	\$4,830	\$86,066
81 Other services	\$0	\$22,577	\$15,404	\$37,981
92 Government & non NAICs	\$69,631	\$8,932	\$35,991	\$114,554
Multiplier	1.46			

### 81B Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$24,808	\$3,534	\$10,459	\$38,801
Sub County Special Districts	\$30,387	\$4,328	\$12,807	\$47,522
County	\$2,469	\$352	\$1,041	\$3,861
State	\$59,031	\$8,213	\$19,677	\$86,921
Federal	\$167,791	\$20,859	\$20,489	\$209,139
<b>Total Tax Impact</b>	<b>\$284,487</b>	<b>\$37,286</b>	<b>\$64,472</b>	<b>\$386,245</b>

## Economic Impacts for Pittsfield Municipal, Somerset County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$3,701,600
Airport Expenditures	\$4,969,200
Airport-Related Employment	17 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$2,470,900
Total Induced Employment Impacts	16 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$7,440,100</b>
<b>Grand Total Income Impacts</b>	<b>\$4,454,800</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>33 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$360,500</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### 2B7 Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>16.9</b>	<b>4.1</b>	<b>12.1</b>	<b>33.1</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.1	0.2
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.1
23 Construction	2.0	0.1	0.1	2.1
31-33 Manufacturing	0.0	0.0	0.0	0.1
42 Wholesale Trade	0.0	0.1	0.1	0.2
44-45 Retail trade	0.3	0.2	2.8	3.2
48-49 Transportation & Warehousing	12.3	1.1	0.3	13.7
51 Information	0.0	0.0	0.1	0.1
52 Finance & insurance	0.0	0.2	0.4	0.6
53 Real estate & rental	0.0	0.4	0.3	0.7
54 Professional- scientific & tech services	0.0	0.1	0.4	0.5
55 Management of companies	0.0	0.1	0.1	0.2
56 Administrative & waste services	0.0	0.5	0.5	0.9
61 Educational services	1.0	0.0	0.3	1.3
62 Health & social services	0.0	0.0	3.9	3.9
71 Arts- entertainment & recreation	0.3	0.0	0.3	0.7
72 Accommodation & food services	1.1	0.9	1.4	3.4
81 Other services	0.0	0.1	0.9	1.1
92 Government & non NAICs	0.0	0.1	0.1	0.2
<i>Multiplier</i>	1.96			

## 2B7 Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$3,701,627</b>	<b>\$196,841</b>	<b>\$556,293</b>	<b>\$4,454,762</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$782	\$7,516	\$8,298
21 Mining	\$0	(\$34)	(\$25)	(\$59)
22 Utilities	\$0	\$1,574	\$6,383	\$7,958
23 Construction	\$121,301	\$4,433	\$7,895	\$133,629
31-33 Manufacturing	\$0	\$3,347	\$1,201	\$4,547
42 Wholesale Trade	\$0	\$4,511	\$7,927	\$12,438
44-45 Retail trade	\$7,459	\$10,639	\$86,964	\$105,062
48-49 Transportation & Warehousing	\$3,492,716	\$63,186	\$15,708	\$3,571,610
51 Information	\$0	\$2,876	\$6,305	\$9,181
52 Finance & insurance	\$0	\$9,683	\$19,101	\$28,784
53 Real estate & rental	\$0	\$16,972	\$9,557	\$26,529
54 Professional- scientific & tech services	\$0	\$7,178	\$18,592	\$25,770
55 Management of companies	\$0	\$11,375	\$9,922	\$21,297
56 Administrative & waste services	\$0	\$15,247	\$15,619	\$30,867
61 Educational services	\$39,728	\$517	\$13,815	\$54,060
62 Health & social services	\$0	\$1	\$235,942	\$235,943
71 Arts- entertainment & recreation	\$3,194	\$233	\$5,232	\$8,658
72 Accommodation & food services	\$37,231	\$27,354	\$36,248	\$100,833
81 Other services	\$0	\$8,993	\$42,743	\$51,736
92 Government & non NAICs	\$0	\$7,972	\$9,649	\$17,621
<i>Multiplier</i>	1.20			

## 2B7 Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$4,969,248</b>	<b>\$574,809</b>	<b>\$1,896,084</b>	<b>\$7,440,142</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$929	\$7,079	\$8,008
21 Mining	\$0	\$469	\$176	\$645
22 Utilities	\$0	\$16,158	\$64,767	\$80,925
23 Construction	\$367,570	\$14,970	\$27,638	\$410,178
31-33 Manufacturing	\$0	\$18,406	\$6,757	\$25,163
42 Wholesale Trade	\$0	\$17,434	\$39,207	\$56,641
44-45 Retail trade	\$19,434	\$31,062	\$282,834	\$333,329
48-49 Transportation & Warehousing	\$4,393,724	\$109,490	\$39,142	\$4,542,356
51 Information	\$0	\$18,011	\$40,298	\$58,309
52 Finance & insurance	\$0	\$45,364	\$88,851	\$134,215
53 Real estate & rental	\$0	\$109,017	\$473,734	\$582,751
54 Professional- scientific & tech services	\$0	\$17,133	\$44,651	\$61,784
55 Management of companies	\$0	\$23,455	\$20,457	\$43,912
56 Administrative & waste services	\$0	\$44,769	\$45,248	\$90,017
61 Educational services	\$80,851	\$1,053	\$15,856	\$97,760
62 Health & social services	\$0	\$2	\$442,791	\$442,792



### 2B7 Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$22,233	\$2,418	\$22,553	\$47,204
72 Accommodation & food services	\$85,437	\$62,514	\$117,711	\$265,662
81 Other services	\$0	\$15,385	\$85,906	\$101,292
92 Government & non NAICs	\$0	\$26,769	\$30,428	\$57,197
Multiplier	1.50			

### 2B7 Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$10,785	\$6,795	\$34,969	\$52,548
Sub County Special Districts	\$13,448	\$8,722	\$44,928	\$67,098
County	\$3,099	\$2,022	\$10,418	\$15,539
State	\$130,482	\$16,992	\$77,865	\$225,340
Federal	\$583,977	\$33,239	\$86,424	\$703,641
<b>Total Tax Impact</b>	<b>\$741,791</b>	<b>\$67,770</b>	<b>\$254,604</b>	<b>\$1,064,166</b>

## Economic Impacts for Princeton Municipal, Washington County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$400,400
Airport Expenditures	\$1,389,800
Airport-Related Employment	9 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$525,700
Total Induced Employment Impacts	3 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$1,915,600</b>
<b>Grand Total Income Impacts</b>	<b>\$543,300</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>13 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$66,300</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### PNN Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>9.2</b>	<b>1.6</b>	<b>1.9</b>	<b>12.6</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	7.6	0.0	0.0	7.6
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.0	0.1	0.1
44-45 Retail trade	0.1	0.3	0.9	1.3
48-49 Transportation & Warehousing	0.1	0.0	0.2	0.3
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.1	0.1	0.1
53 Real estate & rental	0.0	0.1	0.1	0.2
54 Professional- scientific & tech services	0.0	0.0	0.1	0.2
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.1	0.1	0.2
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.5	0.0	0.5
71 Arts- entertainment & recreation	0.1	0.0	0.0	0.1
72 Accommodation & food services	0.3	0.2	0.0	0.5
81 Other services	0.0	0.2	0.1	0.3
92 Government & non NAICs	1.0	0.0	0.0	1.0
<i>Multiplier</i>	1.38			

### PNN Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$400,361</b>	<b>\$61,496</b>	<b>\$81,395</b>	<b>\$543,251</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$435	\$193	\$629
21 Mining	\$0	\$4	\$514	\$518
22 Utilities	\$0	\$579	\$946	\$1,525
23 Construction	\$332,226	\$586	\$368	\$333,180
31-33 Manufacturing	\$0	\$123	\$2,642	\$2,766
42 Wholesale Trade	\$0	\$1,202	\$3,502	\$4,704
44-45 Retail trade	\$1,799	\$10,176	\$38,621	\$50,597
48-49 Transportation & Warehousing	\$2,194	\$1,680	\$9,313	\$13,187
51 Information	\$0	\$619	\$1,107	\$1,726
52 Finance & insurance	\$0	\$3,012	\$4,219	\$7,231
53 Real estate & rental	\$0	\$696	\$1,653	\$2,349
54 Professional- scientific & tech services	\$0	\$2,006	\$5,711	\$7,716
55 Management of companies	\$0	\$1,101	\$3,023	\$4,124
56 Administrative & waste services	\$0	\$1,155	\$4,078	\$5,233
61 Educational services	\$0	\$1,707	\$203	\$1,911
62 Health & social services	\$0	\$24,989	\$1	\$24,990
71 Arts- entertainment & recreation	\$1,153	\$278	\$110	\$1,541
72 Accommodation & food services	\$8,335	\$4,366	\$1,057	\$13,759
81 Other services	\$0	\$6,066	\$3,115	\$9,181
92 Government & non NAICs	\$54,653	\$715	\$1,018	\$56,386
<i>Multiplier</i>	1.36			

### PNN Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,389,845</b>	<b>\$234,739</b>	<b>\$291,005</b>	<b>\$1,915,589</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$782	\$383	\$1,165
21 Mining	\$0	\$24	\$3,197	\$3,221
22 Utilities	\$0	\$6,671	\$10,969	\$17,640
23 Construction	\$1,290,250	\$2,730	\$1,667	\$1,294,647
31-33 Manufacturing	\$0	\$756	\$18,475	\$19,231
42 Wholesale Trade	\$0	\$5,060	\$16,678	\$21,737
44-45 Retail trade	\$4,877	\$34,335	\$113,530	\$152,742
48-49 Transportation & Warehousing	\$4,865	\$4,243	\$24,884	\$33,992
51 Information	\$0	\$6,753	\$12,789	\$19,543
52 Finance & insurance	\$0	\$14,169	\$18,553	\$32,721
53 Real estate & rental	\$0	\$60,836	\$21,993	\$82,829
54 Professional- scientific & tech services	\$0	\$5,066	\$14,779	\$19,845
55 Management of companies	\$0	\$2,235	\$6,135	\$8,370
56 Administrative & waste services	\$0	\$3,926	\$13,636	\$17,562
61 Educational services	\$0	\$2,966	\$380	\$3,346
62 Health & social services	\$0	\$49,250	\$1	\$49,252

**PNN Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$5,580	\$1,587	\$763	\$7,931
72 Accommodation & food services	\$21,443	\$14,675	\$3,110	\$39,228
81 Other services	\$0	\$16,858	\$7,270	\$24,128
92 Government & non NAICs	\$62,829	\$1,816	\$1,813	\$66,459
Multiplier	1.38			

**PNN Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	(\$1,313)	\$12,530	\$7,917	\$19,134
Sub County Special Districts	(\$284)	\$2,662	\$1,682	\$4,060
County	(\$185)	\$1,746	\$1,103	\$2,664
State	\$9,743	\$18,423	\$12,227	\$40,393
Federal	\$77,409	\$11,591	\$10,640	\$99,640
<b>Total Tax Impact</b>	<b>\$85,369</b>	<b>\$46,953</b>	<b>\$33,570</b>	<b>\$165,892</b>

## Economic Impacts for Sanford Seacoast Regional, Portland-South Portland, ME MSA

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$3,992,800
Airport Expenditures	\$8,339,300
Airport-Related Employment	73 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$6,692,900
Total Induced Employment Impacts	37 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$15,032,100</b>
<b>Grand Total Income Impacts</b>	<b>\$6,242,400</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>110 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$986,100</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### SFM Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>72.9</b>	<b>15.0</b>	<b>21.8</b>	<b>109.7</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.1	0.1	0.2
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	1.0	0.2	0.0	1.2
23 Construction	6.9	0.2	0.2	7.3
31-33 Manufacturing	0.0	0.3	0.1	0.3
42 Wholesale Trade	0.0	0.6	0.6	1.1
44-45 Retail trade	0.8	1.0	3.5	5.2
48-49 Transportation & Warehousing	32.2	2.6	0.6	35.4
51 Information	0.0	0.3	0.3	0.6
52 Finance & insurance	0.0	0.8	1.3	2.1
53 Real estate & rental	0.0	1.6	0.9	2.5
54 Professional- scientific & tech services	0.0	1.7	1.1	2.7
55 Management of companies	0.0	0.7	0.2	1.0
56 Administrative & waste services	0.0	2.4	1.0	3.4
61 Educational services	4.0	0.1	0.9	5.0
62 Health & social services	15.0	0.0	5.4	20.4
71 Arts- entertainment & recreation	0.9	0.3	0.8	1.9
72 Accommodation & food services	12.2	0.5	2.3	15.0
81 Other services	0.0	1.2	2.3	3.6
92 Government & non NAICs	0.0	0.4	0.2	0.7
<i>Multiplier</i>	1.51			

### SFM Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$3,992,807</b>	<b>\$979,033</b>	<b>\$1,270,592</b>	<b>\$6,242,432</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$848	\$1,711	\$2,559
21 Mining	\$0	\$1,558	\$47	\$1,605
22 Utilities	\$231,987	\$24,512	\$5,501	\$262,000
23 Construction	\$430,168	\$15,393	\$11,105	\$456,666
31-33 Manufacturing	\$0	\$18,413	\$5,337	\$23,750
42 Wholesale Trade	\$0	\$58,991	\$54,834	\$113,825
44-45 Retail trade	\$29,554	\$48,425	\$142,095	\$220,074
48-49 Transportation & Warehousing	\$1,716,100	\$141,266	\$29,884	\$1,887,250
51 Information	\$0	\$25,670	\$25,811	\$51,481
52 Finance & insurance	\$0	\$76,072	\$122,924	\$198,996
53 Real estate & rental	\$0	\$48,056	\$26,577	\$74,633
54 Professional- scientific & tech services	\$0	\$144,911	\$91,162	\$236,072
55 Management of companies	\$0	\$104,430	\$34,578	\$139,008
56 Administrative & waste services	\$0	\$124,297	\$53,450	\$177,746
61 Educational services	\$179,983	\$3,917	\$42,414	\$226,314
62 Health & social services	\$887,930	\$3,174	\$384,976	\$1,276,080
71 Arts- entertainment & recreation	\$24,406	\$4,074	\$19,384	\$47,863
72 Accommodation & food services	\$492,679	\$17,794	\$80,366	\$590,839
81 Other services	\$0	\$69,550	\$116,651	\$186,201
92 Government & non NAICs	\$0	\$47,683	\$21,785	\$69,468
<i>Multiplier</i>	1.56			

### SFM Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$8,339,268</b>	<b>\$2,872,288</b>	<b>\$3,820,565</b>	<b>\$15,032,121</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$3,014	\$6,800	\$9,814
21 Mining	\$0	\$15,040	\$1,126	\$16,167
22 Utilities	\$1,212,422	\$220,703	\$49,541	\$1,482,667
23 Construction	\$1,306,440	\$53,225	\$39,548	\$1,399,212
31-33 Manufacturing	\$0	\$85,167	\$30,374	\$115,541
42 Wholesale Trade	\$0	\$227,611	\$209,667	\$437,278
44-45 Retail trade	\$65,830	\$133,142	\$401,962	\$600,934
48-49 Transportation & Warehousing	\$2,542,540	\$272,538	\$74,664	\$2,889,742
51 Information	\$0	\$143,387	\$132,567	\$275,955
52 Finance & insurance	\$0	\$279,831	\$435,083	\$714,914
53 Real estate & rental	\$0	\$381,158	\$776,015	\$1,157,172
54 Professional- scientific & tech services	\$0	\$286,858	\$183,851	\$470,710
55 Management of companies	\$0	\$195,083	\$64,594	\$259,677
56 Administrative & waste services	\$0	\$281,493	\$118,692	\$400,186
61 Educational services	\$343,657	\$7,350	\$65,500	\$416,507
62 Health & social services	\$1,639,850	\$6,854	\$680,612	\$2,327,315

**SFM Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$75,313	\$21,138	\$62,635	\$159,086
72 Accommodation & food services	\$1,153,217	\$42,881	\$221,117	\$1,417,214
81 Other services	\$0	\$97,598	\$211,418	\$309,016
92 Government & non NAICs	\$0	\$118,217	\$54,797	\$173,014
Multiplier	1.80			

**SFM Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$168,663	\$69,043	\$101,194	\$338,901
Sub County Special Districts	\$50,171	\$20,534	\$30,096	\$100,801
County	\$8,964	\$3,670	\$5,379	\$18,013
State	\$278,921	\$101,942	\$147,565	\$528,427
Federal	\$683,310	\$164,675	\$219,146	\$1,067,132
<b>Total Tax Impact</b>	<b>\$1,190,029</b>	<b>\$359,864</b>	<b>\$503,381</b>	<b>\$2,053,274</b>

## Economic Impacts for Stephen A. Bean Municipal, Franklin County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$923,600
Airport Expenditures	\$3,180,400
Airport-Related Employment	21 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$1,512,400
Total Induced Employment Impacts	10 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$4,692,800</b>
<b>Grand Total Income Impacts</b>	<b>\$1,331,600</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>30 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$157,100</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### 8B0 Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>20.6</b>	<b>5.5</b>	<b>4.2</b>	<b>30.2</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.1	0.1	0.2
21 Mining	0.0	0.1	0.0	0.1
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	17.1	0.1	0.0	17.2
31-33 Manufacturing	0.0	0.4	0.0	0.4
42 Wholesale Trade	0.0	0.3	0.0	0.3
44-45 Retail trade	0.1	1.7	0.8	2.6
48-49 Transportation & Warehousing	3.1	0.4	0.1	3.6
51 Information	0.0	0.0	0.0	0.1
52 Finance & insurance	0.0	0.3	0.2	0.5
53 Real estate & rental	0.0	0.4	0.2	0.6
54 Professional- scientific & tech services	0.0	0.6	0.2	0.8
55 Management of companies	0.0	0.0	0.0	0.1
56 Administrative & waste services	0.0	0.5	0.1	0.6
61 Educational services	0.0	0.0	0.1	0.1
62 Health & social services	0.0	0.0	1.2	1.2
71 Arts- entertainment & recreation	0.1	0.1	0.1	0.2
72 Accommodation & food services	0.3	0.1	0.6	1.0
81 Other services	0.0	0.3	0.4	0.7
92 Government & non NAICs	0.0	0.1	0.1	0.1
<i>Multiplier</i>	1.47			



### 8B0 Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$923,630</b>	<b>\$236,153</b>	<b>\$171,782</b>	<b>\$1,331,565</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$2,630	\$917	\$3,546
21 Mining	\$0	\$253	\$1	\$254
22 Utilities	\$0	\$2,015	\$1,200	\$3,215
23 Construction	\$706,975	\$2,060	\$1,782	\$710,816
31-33 Manufacturing	\$0	\$25,149	\$744	\$25,893
42 Wholesale Trade	\$0	\$15,502	\$1,960	\$17,462
44-45 Retail trade	\$2,057	\$83,940	\$29,818	\$115,815
48-49 Transportation & Warehousing	\$203,441	\$30,169	\$3,333	\$236,943
51 Information	\$0	\$1,739	\$1,339	\$3,078
52 Finance & insurance	\$0	\$12,173	\$10,136	\$22,309
53 Real estate & rental	\$0	\$10,045	\$3,633	\$13,678
54 Professional- scientific & tech services	\$0	\$13,399	\$5,478	\$18,878
55 Management of companies	\$0	\$1,697	\$589	\$2,286
56 Administrative & waste services	\$0	\$14,911	\$4,645	\$19,556
61 Educational services	\$0	\$118	\$5,440	\$5,558
62 Health & social services	\$0	\$1	\$66,107	\$66,108
71 Arts- entertainment & recreation	\$1,854	\$869	\$3,595	\$6,318
72 Accommodation & food services	\$9,303	\$4,299	\$15,766	\$29,368
81 Other services	\$0	\$10,319	\$12,033	\$22,352
92 Government & non NAICs	\$0	\$4,864	\$3,269	\$8,132
<i>Multiplier</i>	1.44			

### 8B0 Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$3,180,439</b>	<b>\$883,414</b>	<b>\$628,974</b>	<b>\$4,692,828</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$4,616	\$2,374	\$6,990
21 Mining	\$0	\$13,977	\$101	\$14,078
22 Utilities	\$0	\$21,911	\$12,923	\$34,833
23 Construction	\$2,855,470	\$9,979	\$8,667	\$2,874,116
31-33 Manufacturing	\$0	\$151,386	\$4,960	\$156,347
42 Wholesale Trade	\$0	\$70,492	\$7,685	\$78,177
44-45 Retail trade	\$4,763	\$225,049	\$87,157	\$316,969
48-49 Transportation & Warehousing	\$293,817	\$67,091	\$7,823	\$368,731
51 Information	\$0	\$20,890	\$12,955	\$33,844
52 Finance & insurance	\$0	\$62,503	\$65,975	\$128,478
53 Real estate & rental	\$0	\$83,392	\$151,116	\$234,508
54 Professional- scientific & tech services	\$0	\$53,713	\$20,608	\$74,322
55 Management of companies	\$0	\$6,261	\$2,174	\$8,435
56 Administrative & waste services	\$0	\$42,483	\$12,856	\$55,339
61 Educational services	\$0	\$222	\$6,537	\$6,759
62 Health & social services	\$0	\$2	\$130,741	\$130,743

### 8B0 Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$5,449	\$3,111	\$10,391	\$18,951
72 Accommodation & food services	\$20,940	\$11,866	\$48,258	\$81,065
81 Other services	\$0	\$21,051	\$25,365	\$46,416
92 Government & non NAICs	\$0	\$13,419	\$10,308	\$23,728
Multiplier	1.48			

### 8B0 Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$1,046	\$21,900	\$14,550	\$37,496
Sub County Special Districts	\$598	\$12,563	\$8,346	\$21,507
County	\$184	\$3,846	\$2,555	\$6,585
State	\$23,637	\$40,187	\$27,666	\$91,490
Federal	\$160,417	\$31,662	\$26,867	\$218,947
<b>Total Tax Impact</b>	<b>\$185,883</b>	<b>\$110,158</b>	<b>\$79,985</b>	<b>\$376,025</b>

## Economic Impacts for Stonington Municipal, Hancock County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$10,200
Airport Expenditures	\$16,800
Airport-Related Employment	0 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$8,000
Total Induced Employment Impacts	0 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$24,800</b>
<b>Grand Total Income Impacts</b>	<b>\$12,500</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>0 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$1,800</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### 93B Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>0.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.3</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	0.0	0.0	0.0	0.0
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.0	0.0	0.0
44-45 Retail trade	0.0	0.0	0.0	0.0
48-49 Transportation & Warehousing	0.0	0.0	0.0	0.0
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.0	0.0	0.0
53 Real estate & rental	0.0	0.0	0.0	0.0
54 Professional- scientific & tech services	0.0	0.0	0.0	0.0
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.0	0.0	0.0
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.0	0.0	0.0
71 Arts- entertainment & recreation	0.0	0.0	0.0	0.0
72 Accommodation & food services	0.1	0.0	0.0	0.1
81 Other services	0.0	0.0	0.0	0.0
92 Government & non NAICs	0.1	0.0	0.0	0.1
<i>Multiplier</i>	1.26			

### 93B Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$10,159</b>	<b>\$1,635</b>	<b>\$691</b>	<b>\$12,486</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$10	\$6	\$16
21 Mining	\$0	\$0	\$0	\$0
22 Utilities	\$0	\$12	\$22	\$34
23 Construction	\$0	\$19	\$18	\$37
31-33 Manufacturing	\$0	\$2	\$3	\$5
42 Wholesale Trade	\$0	\$29	\$15	\$44
44-45 Retail trade	\$654	\$272	\$21	\$948
48-49 Transportation & Warehousing	\$834	\$35	\$69	\$939
51 Information	\$0	\$20	\$24	\$44
52 Finance & insurance	\$0	\$72	\$50	\$122
53 Real estate & rental	\$0	\$35	\$51	\$86
54 Professional- scientific & tech services	\$0	\$76	\$57	\$133
55 Management of companies	\$0	\$25	\$107	\$132
56 Administrative & waste services	\$0	\$33	\$68	\$101
61 Educational services	\$0	\$49	\$3	\$52
62 Health & social services	\$0	\$575	\$0	\$575
71 Arts- entertainment & recreation	\$660	\$48	\$12	\$720
72 Accommodation & food services	\$3,350	\$153	\$77	\$3,581
81 Other services	\$0	\$151	\$48	\$198
92 Government & non NAICs	\$4,661	\$19	\$40	\$4,719
<i>Multiplier</i>	1.23			

### 93B Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$16,848</b>	<b>\$5,586</b>	<b>\$2,397</b>	<b>\$24,832</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$14	\$8	\$22
21 Mining	\$0	\$1	\$2	\$3
22 Utilities	\$0	\$127	\$257	\$385
23 Construction	\$1	\$75	\$71	\$147
31-33 Manufacturing	\$0	\$16	\$13	\$29
42 Wholesale Trade	\$0	\$136	\$69	\$205
44-45 Retail trade	\$1,524	\$812	\$66	\$2,402
48-49 Transportation & Warehousing	\$1,520	\$91	\$131	\$1,743
51 Information	\$0	\$113	\$126	\$239
52 Finance & insurance	\$0	\$348	\$219	\$566
53 Real estate & rental	\$0	\$1,424	\$520	\$1,944
54 Professional- scientific & tech services	\$0	\$185	\$136	\$321
55 Management of companies	\$0	\$42	\$179	\$221
56 Administrative & waste services	\$0	\$101	\$218	\$319
61 Educational services	\$0	\$78	\$6	\$84
62 Health & social services	\$0	\$1,087	\$0	\$1,087

### 93B Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$1,744	\$135	\$70	\$1,948
72 Accommodation & food services	\$6,701	\$398	\$157	\$7,256
81 Other services	\$0	\$354	\$82	\$436
92 Government & non NAICs	\$5,358	\$50	\$67	\$5,475
Multiplier	1.47			

### 93B Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$401	\$60	\$211	\$671
Sub County Special Districts	\$112	\$17	\$59	\$188
County	\$18	\$3	\$9	\$30
State	\$610	\$74	\$245	\$929
Federal	\$1,975	\$121	\$273	\$2,369
<b>Total Tax Impact</b>	<b>\$3,116</b>	<b>\$274</b>	<b>\$796</b>	<b>\$4,187</b>

## Economic Impacts for Sugarloaf Regional, Franklin County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$367,700
Airport Expenditures	\$780,500
Airport-Related Employment	7 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$415,800
Total Induced Employment Impacts	3 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$1,196,400</b>
<b>Grand Total Income Impacts</b>	<b>\$477,800</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>10 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$72,200</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### B21 Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>7.4</b>	<b>1.3</b>	<b>1.5</b>	<b>10.2</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	1.5	0.0	0.0	1.6
31-33 Manufacturing	0.0	0.0	0.0	0.0
42 Wholesale Trade	0.0	0.0	0.0	0.0
44-45 Retail trade	0.1	0.2	0.3	0.6
48-49 Transportation & Warehousing	2.2	0.1	0.0	2.3
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.1	0.1	0.2
53 Real estate & rental	0.0	0.2	0.1	0.2
54 Professional- scientific & tech services	0.0	0.1	0.1	0.2
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.2	0.1	0.2
61 Educational services	3.0	0.0	0.0	3.1
62 Health & social services	0.0	0.0	0.4	0.4
71 Arts- entertainment & recreation	0.1	0.0	0.0	0.2
72 Accommodation & food services	0.5	0.1	0.2	0.7
81 Other services	0.0	0.1	0.1	0.2
92 Government & non NAICs	0.0	0.0	0.0	0.1
<i>Multiplier</i>	1.37			

### B21 Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$367,738</b>	<b>\$49,600</b>	<b>\$60,431</b>	<b>\$477,768</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$284	\$323	\$608
21 Mining	\$0	\$23	\$0	\$23
22 Utilities	\$0	\$516	\$424	\$940
23 Construction	\$62,820	\$988	\$626	\$64,433
31-33 Manufacturing	\$0	\$2,516	\$262	\$2,778
42 Wholesale Trade	\$0	\$1,728	\$691	\$2,419
44-45 Retail trade	\$4,114	\$8,067	\$10,497	\$22,678
48-49 Transportation & Warehousing	\$138,542	\$7,222	\$1,171	\$146,934
51 Information	\$0	\$886	\$472	\$1,358
52 Finance & insurance	\$0	\$5,627	\$3,565	\$9,192
53 Real estate & rental	\$0	\$4,197	\$1,280	\$5,476
54 Professional- scientific & tech services	\$0	\$2,978	\$1,925	\$4,903
55 Management of companies	\$0	\$684	\$207	\$892
56 Administrative & waste services	\$0	\$5,615	\$1,633	\$7,248
61 Educational services	\$139,947	\$1,547	\$1,876	\$143,371
62 Health & social services	\$0	\$0	\$23,289	\$23,289
71 Arts- entertainment & recreation	\$3,708	\$333	\$1,260	\$5,300
72 Accommodation & food services	\$18,607	\$1,557	\$5,540	\$25,704
81 Other services	\$0	\$2,644	\$4,237	\$6,881
92 Government & non NAICs	\$0	\$2,188	\$1,153	\$3,341
<i>Multiplier</i>	1.30			

### B21 Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$780,549</b>	<b>\$194,669</b>	<b>\$221,152</b>	<b>\$1,196,370</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$514	\$837	\$1,352
21 Mining	\$0	\$1,297	\$36	\$1,333
22 Utilities	\$0	\$5,673	\$4,563	\$10,236
23 Construction	\$253,731	\$4,785	\$3,043	\$261,558
31-33 Manufacturing	\$0	\$14,964	\$1,750	\$16,714
42 Wholesale Trade	\$0	\$7,756	\$2,708	\$10,465
44-45 Retail trade	\$9,526	\$21,936	\$30,683	\$62,146
48-49 Transportation & Warehousing	\$202,213	\$13,753	\$2,749	\$218,716
51 Information	\$0	\$9,256	\$4,563	\$13,819
52 Finance & insurance	\$0	\$29,192	\$23,201	\$52,393
53 Real estate & rental	\$0	\$36,346	\$52,969	\$89,315
54 Professional- scientific & tech services	\$0	\$11,489	\$7,240	\$18,729
55 Management of companies	\$0	\$2,525	\$765	\$3,290
56 Administrative & waste services	\$0	\$15,685	\$4,520	\$20,206
61 Educational services	\$262,299	\$2,900	\$2,258	\$267,457
62 Health & social services	\$0	\$1	\$46,080	\$46,081

**B21 Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$10,899	\$1,220	\$3,647	\$15,766
72 Accommodation & food services	\$41,881	\$4,119	\$16,969	\$62,969
81 Other services	\$0	\$5,006	\$8,929	\$13,935
92 Government & non NAICs	\$0	\$6,251	\$3,640	\$9,891
Multiplier	1.53			

**B21 Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$9,961	\$3,399	\$5,114	\$18,474
Sub County Special Districts	\$5,713	\$1,950	\$2,934	\$10,597
County	\$1,749	\$597	\$898	\$3,244
State	\$23,521	\$6,651	\$9,725	\$39,898
Federal	\$58,494	\$7,617	\$9,451	\$75,562
<b>Total Tax Impact</b>	<b>\$99,439</b>	<b>\$20,214</b>	<b>\$28,122</b>	<b>\$147,775</b>



## Economic Impacts for Waterville Robert LaFleur, Kennebec County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$1,911,300
Airport Expenditures	\$4,086,500
Airport-Related Employment	34 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$2,507,000
Total Induced Employment Impacts	15 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$6,593,500</b>
<b>Grand Total Income Impacts</b>	<b>\$2,711,600</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>48 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$348,800</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### WVL Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>33.7</b>	<b>6.4</b>	<b>8.3</b>	<b>48.5</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.1	0.1	0.1
21 Mining	0.0	0.1	0.0	0.1
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	12.0	0.1	0.1	12.1
31-33 Manufacturing	0.0	0.2	0.0	0.2
42 Wholesale Trade	0.0	0.5	0.2	0.7
44-45 Retail trade	0.4	1.4	1.5	3.4
48-49 Transportation & Warehousing	7.4	0.7	0.2	8.3
51 Information	0.0	0.1	0.1	0.2
52 Finance & insurance	0.0	0.3	0.3	0.6
53 Real estate & rental	0.0	0.5	0.3	0.8
54 Professional- scientific & tech services	0.0	0.6	0.3	0.9
55 Management of companies	0.0	0.3	0.1	0.4
56 Administrative & waste services	0.0	0.7	0.3	0.9
61 Educational services	7.0	0.1	0.5	7.6
62 Health & social services	0.0	0.0	2.3	2.3
71 Arts- entertainment & recreation	0.4	0.1	0.2	0.7
72 Accommodation & food services	1.6	0.2	1.0	2.8
81 Other services	0.0	0.4	0.8	1.2
92 Government & non NAICs	5.0	0.1	0.1	5.2
<i>Multiplier</i>	1.44			

### WVL Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,911,252</b>	<b>\$373,489</b>	<b>\$426,841</b>	<b>\$2,711,582</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$570	\$1,047	\$1,617
21 Mining	\$0	\$2,176	\$18	\$2,193
22 Utilities	\$0	\$2,866	\$2,887	\$5,752
23 Construction	\$657,257	\$3,529	\$3,523	\$664,309
31-33 Manufacturing	\$0	\$11,598	\$1,265	\$12,864
42 Wholesale Trade	\$0	\$43,165	\$17,623	\$60,788
44-45 Retail trade	\$12,306	\$71,752	\$57,149	\$141,208
48-49 Transportation & Warehousing	\$429,921	\$46,122	\$12,846	\$488,889
51 Information	\$0	\$8,020	\$6,435	\$14,456
52 Finance & insurance	\$0	\$20,097	\$18,209	\$38,305
53 Real estate & rental	\$0	\$18,511	\$8,780	\$27,291
54 Professional- scientific & tech services	\$0	\$43,986	\$16,781	\$60,766
55 Management of companies	\$0	\$24,258	\$10,923	\$35,181
56 Administrative & waste services	\$0	\$31,071	\$12,844	\$43,916
61 Educational services	\$378,455	\$7,484	\$21,272	\$407,211
62 Health & social services	\$0	\$2	\$155,588	\$155,589
71 Arts- entertainment & recreation	\$10,271	\$894	\$4,319	\$15,484
72 Accommodation & food services	\$61,502	\$6,289	\$30,209	\$98,000
81 Other services	\$0	\$21,763	\$38,318	\$60,081
92 Government & non NAICs	\$361,539	\$9,335	\$6,806	\$377,681
<i>Multiplier</i>	1.42			

### WVL Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$4,086,511</b>	<b>\$1,172,993</b>	<b>\$1,334,002</b>	<b>\$6,593,506</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$1,401	\$2,454	\$3,855
21 Mining	\$0	\$31,557	\$530	\$32,087
22 Utilities	\$0	\$27,309	\$27,633	\$54,942
23 Construction	\$2,182,000	\$13,683	\$14,079	\$2,209,762
31-33 Manufacturing	\$0	\$53,422	\$4,847	\$58,269
42 Wholesale Trade	\$0	\$185,394	\$71,078	\$256,472
44-45 Retail trade	\$30,484	\$192,322	\$168,732	\$391,537
48-49 Transportation & Warehousing	\$628,877	\$102,633	\$30,490	\$762,000
51 Information	\$0	\$42,606	\$32,688	\$75,295
52 Finance & insurance	\$0	\$80,736	\$79,284	\$160,020
53 Real estate & rental	\$0	\$122,939	\$281,021	\$403,960
54 Professional- scientific & tech services	\$0	\$92,558	\$38,407	\$130,965
55 Management of companies	\$0	\$55,611	\$25,041	\$80,652
56 Administrative & waste services	\$0	\$73,119	\$29,445	\$102,564
61 Educational services	\$660,628	\$13,062	\$32,512	\$706,201
62 Health & social services	\$0	\$3	\$282,678	\$282,681

### WVL Output

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$34,875	\$5,780	\$16,019	\$56,674
72 Accommodation & food services	\$134,018	\$16,479	\$92,888	\$243,385
81 Other services	\$0	\$39,022	\$83,783	\$122,805
92 Government & non NAICs	\$415,629	\$23,357	\$20,394	\$459,380
Multiplier	1.61			

### WVL Tax Impact Summary

Impact	Direct	Indirect	Induced	Total
Sub County General	\$26,480	\$32,627	\$30,917	\$90,024
Sub County Special Districts	\$10,522	\$13,016	\$12,332	\$35,870
County	\$1,810	\$2,238	\$2,121	\$6,168
State	\$85,857	\$65,796	\$65,100	\$216,753
Federal	\$317,766	\$51,328	\$66,833	\$435,927
<b>Total Tax Impact</b>	<b>\$442,436</b>	<b>\$165,006</b>	<b>\$177,302</b>	<b>\$784,743</b>

## Economic Impacts for Wiscasset, Lincoln County, ME

ITEM	2022
<b>Direct Impacts</b>	
Airport-Related Payrolls	\$364,300
Airport Expenditures	\$1,112,800
Airport-Related Employment	8 Jobs
<b>Induced Impacts</b>	
Induced Impacts	\$498,900
Total Induced Employment Impacts	3 Jobs
<b>Grand Total Dollar Impacts</b>	<b>\$1,611,700</b>
<b>Grand Total Income Impacts</b>	<b>\$501,900</b>
<b>Grand Total Employment Impacts<sup>1</sup></b>	<b>11 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$56,800</b>

<sup>1</sup>Jobs are rounded to the nearest full-time job

### IWI Employment

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>7.7</b>	<b>1.3</b>	<b>1.8</b>	<b>10.9</b>
11 Ag, Forestry, Fish & Hunting	0.0	0.0	0.0	0.0
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	5.5	0.0	0.0	5.5
31-33 Manufacturing	0.0	0.0	0.1	0.1
42 Wholesale Trade	0.0	0.0	0.1	0.2
44-45 Retail trade	0.2	0.2	0.6	1.0
48-49 Transportation & Warehousing	0.3	0.0	0.2	0.5
51 Information	0.0	0.0	0.0	0.0
52 Finance & insurance	0.0	0.1	0.0	0.1
53 Real estate & rental	0.0	0.0	0.1	0.2
54 Professional- scientific & tech services	0.0	0.1	0.2	0.2
55 Management of companies	0.0	0.0	0.0	0.1
56 Administrative & waste services	0.0	0.1	0.2	0.2
61 Educational services	0.0	0.0	0.0	0.0
62 Health & social services	0.0	0.3	0.0	0.3
71 Arts- entertainment & recreation	0.2	0.0	0.0	0.2
72 Accommodation & food services	0.7	0.2	0.1	0.9
81 Other services	0.0	0.2	0.1	0.3
92 Government & non NAICs	1.0	0.0	0.0	1.0
<i>Multiplier</i>	1.41			

### IWI Income

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$364,268</b>	<b>\$56,538</b>	<b>\$81,046</b>	<b>\$501,853</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$521	\$376	\$897
21 Mining	\$0	\$1	\$149	\$149
22 Utilities	\$0	\$38	\$75	\$113
23 Construction	\$255,857	\$680	\$652	\$257,188
31-33 Manufacturing	\$0	\$72	\$5,370	\$5,441
42 Wholesale Trade	\$0	\$1,058	\$4,022	\$5,081
44-45 Retail trade	\$5,010	\$7,990	\$27,559	\$40,558
48-49 Transportation & Warehousing	\$5,054	\$1,110	\$6,588	\$12,752
51 Information	\$0	\$1,058	\$1,692	\$2,751
52 Finance & insurance	\$0	\$2,855	\$3,936	\$6,792
53 Real estate & rental	\$0	\$1,064	\$3,561	\$4,625
54 Professional- scientific & tech services	\$0	\$3,465	\$7,921	\$11,386
55 Management of companies	\$0	\$1,538	\$4,713	\$6,251
56 Administrative & waste services	\$0	\$1,899	\$6,464	\$8,363
61 Educational services	\$0	\$2,012	\$91	\$2,103
62 Health & social services	\$0	\$17,828	\$1	\$17,830
71 Arts- entertainment & recreation	\$5,049	\$1,498	\$248	\$6,795
72 Accommodation & food services	\$25,466	\$5,117	\$1,725	\$32,308
81 Other services	\$0	\$5,476	\$4,208	\$9,684
92 Government & non NAICs	\$67,834	\$1,259	\$1,695	\$70,788
<i>Multiplier</i>	1.38			

### IWI Output

Description	Direct	Indirect	Induced	Total
<b>Total</b>	<b>\$1,112,774</b>	<b>\$207,468</b>	<b>\$291,478</b>	<b>\$1,611,720</b>
11 Ag, Forestry, Fish & Hunting	\$0	\$996	\$1,073	\$2,069
21 Mining	\$0	\$26	\$3,079	\$3,105
22 Utilities	\$0	\$2,673	\$5,204	\$7,877
23 Construction	\$937,851	\$2,929	\$2,763	\$943,542
31-33 Manufacturing	\$0	\$389	\$32,581	\$32,970
42 Wholesale Trade	\$0	\$7,602	\$26,200	\$33,802
44-45 Retail trade	\$12,860	\$26,451	\$76,408	\$115,720
48-49 Transportation & Warehousing	\$12,829	\$3,850	\$21,799	\$38,477
51 Information	\$0	\$4,973	\$7,703	\$12,676
52 Finance & insurance	\$0	\$14,734	\$16,139	\$30,873
53 Real estate & rental	\$0	\$51,702	\$33,080	\$84,783
54 Professional- scientific & tech services	\$0	\$8,844	\$19,681	\$28,526
55 Management of companies	\$0	\$3,133	\$9,602	\$12,735
56 Administrative & waste services	\$0	\$5,252	\$18,275	\$23,527
61 Educational services	\$0	\$2,785	\$195	\$2,980
62 Health & social services	\$0	\$35,492	\$2	\$35,495

**IWI Output**

Description	Direct	Indirect	Induced	Total
71 Arts- entertainment & recreation	\$14,713	\$4,439	\$1,238	\$20,391
72 Accommodation & food services	\$56,539	\$14,597	\$4,362	\$75,498
81 Other services	\$0	\$13,053	\$8,515	\$21,567
92 Government & non NAICs	\$77,982	\$3,548	\$3,578	\$85,108
Multiplier	1.45			

**IWI Tax Impact Summary**

Impact	Direct	Indirect	Induced	Total
Sub County General	\$1,185	\$8,524	\$5,310	\$15,019
Sub County Special Districts	\$848	\$6,089	\$3,793	\$10,730
County	\$195	\$1,401	\$873	\$2,468
State	\$9,873	\$11,340	\$7,393	\$28,606
Federal	\$66,944	\$11,056	\$8,786	\$86,786
<b>Total Tax Impact</b>	<b>\$79,046</b>	<b>\$38,409</b>	<b>\$26,155</b>	<b>\$143,610</b>



## **Maine Economic Impact**

[www.maine.gov/mdot/aviation](http://www.maine.gov/mdot/aviation)

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**MaineDOT**

Ph: 207-624-3000

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16 Statehouse Station  
Augusta, ME 04333

# Attachment 2: State-Wide Economic Impacts of Aviation by Airport

State-Wide Economic Impacts of Aviation by Airport

36 Pages

Auburn Lewiston Municipal Airport (LEW)

Augusta State Airport (AUG)

Bangor International Airport (BGR)

Bar Harbor Airport (BHB)

Belfast Municipal Airport (BST)

Bethel Regional Airport (OB1)

Biddeford Municipal Airport (B19)

Brunswick Executive Airport (BXM)

Caribou Municipal Airport (CAR)

Central Maine Regional Airport (CAR)

Charles A. Chase Jr. Memorial Field (44B)

Dewitt Field, Old Town Municipal (OLD)

Dexter Regional Airport (1B0)

Eastern Slope Regional Airport (IZG)

Eastport Municipal Airport (EPM)

Greenville Municipal Airport (3B1)

Houlton International Airport (HUL)

Islesboro Airport (57B)

Knox County Regional Airport (RKD)

Lincoln Regional Airport (LRG)

Machias Valley Municipal Airport (MVM)

Millinocket Municipal Airport (MVM)

Newton Field (59B)

Northern Aroostook Regional Airport (FVE)



- Oxford County Regional Airport (81B)
- Pittsfield Municipal Airport (2B7)
- Portland International Jetport (PWM)
- Presque Isle International Airport (PQI)
- Princeton Municipal Airport (PNN)
- Sanford Seacoast Regional Airport (SFM)
- Stephen A. Bean Municipal Airport (8B0)
- Stonington Municipal Airport (93B)
- Sugarloaf Regional Airport (B21)
- Waterville Robert LaFleur Airport (WVL)
- Wiscasset Airport (IWI)

# STATEWIDE ECONOMIC IMPACTS OF AVIATION

Aviation is a vital cornerstone in shaping Maine's economy. Our state's diverse range of airports, both commercial and general aviation, not only facilitate business operations, tourism, and general transportation needs but also substantially fuel our economic engine. Broadly, the economic impact of aviation can be categorized into Direct, Indirect (or Induced), and Total output.

## DIRECT IMPACTS



**Direct impacts** include the tangible effects directly rooted in aviation: jobs at our airports, associated payrolls, and output stemming from airport operations, capital spending, airport-based businesses, airline services, and off-airport spending of visitors arriving by air.

## + INDUCED IMPACTS

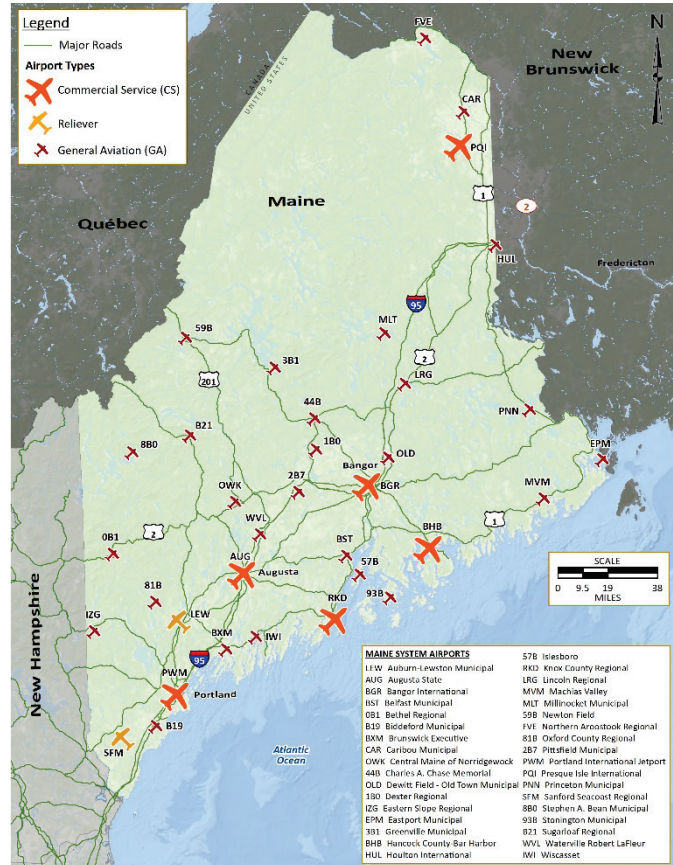


**Induced impacts** represent the ripple effects or respending of these direct economic impacts as they flow through the wider economy.

## = TOTAL OUTPUT



**Total output** marries these Direct and Induced impacts, giving a total picture of the value generated by the aviation industry within Maine. Additionally, the tax impacts offer insights into the state and local taxes produced by aviation activities.



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In 2022, Maine's six Commercial Service airports were responsible for 13,640 jobs, contributing to an annual income of approximately \$676.4 million and an economic output of about \$1.67 billion. These airports also contribute roughly \$135.97 million in state and local taxes. Meanwhile, the state's 29 General Aviation airports supported 782 jobs, with a combined annual income of around \$45.4 million and a total economic output of about \$115.9 million, along with almost \$5.1 million in state and local taxes.

In total, aviation in Maine supports 14,422 jobs, generating an annual income of about \$721.8 million, an overall economic

output of nearly \$1.79 billion, and combined state and local tax impacts of approximately \$141.1 million.

The 2022 direct and induced impacts of aviation in Maine underscores the significance of our airports. They not only facilitate transportation and connectivity but are also powerful economic catalysts, creating thousands of jobs and pumping millions into our state treasury. As we appreciate these numbers, it's evident that supporting and nurturing our aviation infrastructure is not just about flights—it's about fueling Maine's prosperity.

### 2022 Statewide Impacts of Aviation in Maine

Airport Category	Employment	Income	Output
Commercial Service	13,640	\$676,389,500	\$1,674,238,500
General Aviation	782	\$45,395,500	\$115,909,900
<b>Total</b>	<b>14,422</b>	<b>\$721,785,000</b>	<b>\$1,790,148,400</b>



# AUBURN/LEWISTON MUNICIPAL AIRPORT

Auburn/Lewiston Municipal Airport (LEW) is a full-service Airport, operating 24 hours a day throughout the year. Located in the southern Maine Lakes & Mountains Region, the Airport is jointly owned and operated by the Cities of Auburn and Lewiston. LEW provides a range of services and amenities designed to meet the needs of general aviation (GA) operators. The Airport is non-towered and features a 5,001’ primary runway, a 2,750’ crosswind runway, a precision approach, and a full-parallel taxiway.

In 2022, LEW reported approximately 50,000 aircraft operations. Home to 53 based aircraft, including 39 single-engine aircraft, 9 multi-engine aircraft, 1 jet aircraft, and 4 helicopters, the Airport accommodates a diverse array of aircraft, ranging from small recreational planes to larger business jets. LEW offers a variety of services, such as rental cars, competitive fuel prices, on-field maintenance, and on-site restaurant and catering facilities. Key operators include Skyward Aviation Maintenance, LifeFlight, Auburn-Lewiston Air Center, Dirigo Aerospace Solutions, and Elite Airways Maintenance. The Airport is also a popular choice for transient users, hosting well-known fractional jet operators like NetJets, Flexjet, etc.

## Economic Benefits

LEW supports a number of economic activities. Accommodating a broad range of services like aircraft maintenance, fueling, and charter services, the Airport generates business opportunities and employment in the area. Additional amenities, such as rental car agencies and on-site dining, also contribute to economic activity. Located strategically in the southern Maine Lakes & Mountains Region, the Airport attracts visitors and businesses, boosting the local economy.

In 2022, the total economic impact for Auburn/Lewiston Municipal Airport amounted to \$16.3 million, supporting 101 jobs, and contributing almost \$760,000 in State and local taxes.

<b>Economic Impact for Auburn/Lewiston Muni</b>	
<b>Item</b>	<b>2022</b>
<b>Grand Total Dollar Impacts</b>	<b>\$16,282,900</b>
<b>Grand Total Income Impacts</b>	<b>\$5,506,600</b>
<b>Grand Total Employment Impacts</b>	<b>101 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$759,800</b>



# AUGUSTA STATE AIRPORT

Augusta State Airport (AUG) is a 24-hour, year-round facility located in Kennebec County, Maine. It is the only state-owned airport in the NPIAS (National Plan of Integrated Airport Systems) and is operated under contract with the City of Augusta. Situated in the state capital, Augusta, the Airport serves as an important transportation hub for the region. AUG features a 5,002' primary runway with partial parallel taxiway, and a precision instrument approach. In addition, there is a 2,613' crosswind runway.

In 2022, AUG handled 5,695 enplanements and a total of 23,128 aircraft operations. The Airport has 47 based aircraft, including 39 single-engine aircraft and 8 multi-engine aircraft. AUG offers daily scheduled air service by Cape Air under the U.S. DOT Essential Air Service program. It is serviced by Maine Instrument Flight, a full-service FBO (Fixed Base Operator) offering 100LL and Jet-A fueling, charter services, instruction, aircraft sales, and maintenance on-site. AUG serves as a vital link for both commercial and general aviation traffic in the area.

## Economic Benefits

In addition to the services provided by Cape Air, AUG supports various economic activities on and off the Airport. These include rental car agencies, concessionaires, FAA, aircraft maintenance, and fuel sales personnel. The Airport also provides air access benefits to visitors and prominent employers in the area, such as state government agencies, corporate headquarters, and local businesses.

In 2022, the total economic impact for Augusta State Airport was \$14 million, supporting 101 jobs, and contributing \$863,300 in state and local taxes.

<b>Economic Impact for Augusta State Airport</b>	
<b>Item</b>	<b>2022</b>
<b>Grand Total Dollar Impacts</b>	<b>\$14,005,500</b>
<b>Grand Total Income Impacts</b>	<b>\$6,002,300</b>
<b>Grand Total Employment Impacts</b>	<b>101 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$863,300</b>



# BANGOR INTERNATIONAL AIRPORT

Bangor International Airport (BGR) is a joint-use civil/military Airport located in Penobscot County, in the central part of the State. The Airport serves as Maine's second busiest commercial service airport, measured by passenger enplanements. BGR offers an 11,440' primary runway, providing ample length for the largest aircraft operations. The Airport has Customs and Immigration facilities, making it one of the first airports in the United States for arriving transatlantic flights. It also serves as a refueling location and disembarkation point for military charter flights. BGR is home to the 101st Air Refueling Wing, a unit of the Maine Air National Guard.

In 2022, BGR enplaned 349,589 passengers and accommodated 44,682 aircraft operations. The Airport has a diverse mix of aviation activity. There are 40 based civilian aircraft and 28 based military aircraft. BGR is served by American Airlines, Allegiant, Delta, and United, providing daily year-round service to eight destinations. It also serves as a safe diversion airport and refueling option for both commercial and military aircraft.

## Economic Benefits

BGR supports area businesses and organizations which contribute to the local economy. These include the military, rental car agencies, concessionaires, aircraft maintenance providers, fuel sales personnel, and non-military government organizations such as the TSA, FAA, and Airport management and staff. Additionally, the Airport's location facilitates transportation for tourism, government agencies, corporate headquarters, and local industries, promoting economic growth and connectivity. BGR serves as an important gateway to the northern and eastern parts of the state, including Acadia National Park and the North Woods.

In 2022, the total impact for Bangor International Airport was \$341.98 million, supporting 2,808 jobs, and contributing \$21.62 million in State and local taxes.

Economic Impact for Bangor International	
Item	2022
Grand Total Dollar Impacts	\$341,980,000
Grand Total Income Impacts	\$141,333,700
Grand Total Employment Impacts	2,808 Jobs
Estimated State and Local Taxes	\$21,616,600



# BAR HARBOR AIRPORT

Hancock County-Bar Harbor Airport (BHB) is a non-towered facility, recognized as the fifth busiest commercial service airport in Maine. Located in Hancock County, the Airport features two asphalt runways: Runway 4/22 is 5,200' by 100'; crosswind Runway 17/35 is 3,363' by 75'. BHB has an airline passenger terminal building equipped with a variety of amenities. The Airport's FBO, Modern Aviation, provides fueling service, ground handling, rental cars, and a number of other services.

In 2022, BHB recorded 8,396 enplanements and a total of 23,989 aircraft operations. The Airport has 26 based aircraft, including 25 single-engine aircraft and 1 helicopter. Cape Air provides daily airline service to Boston under the U.S. DOT Essential Air Service program.

## Economic Benefits

BHB supports a broad range of economic activities, with contributions from Cape Air's operations under the Essential Air Service program, rental car agencies, concessionaires, and other businesses that meet travelers' needs. The Airport facilitates both tourism and business travel to key attractions including Bar Harbor, Acadia National Park, Mount Desert Island, and a multitude of summer colonies.

In 2022, the total impact for Hancock County-Bar Harbor Airport amounted to \$18.17 million, supporting 123 jobs, and contributing \$1.36 million in State and local taxes.

<b>Economic Impact for Bar Harbor Airport</b>	
<b>Item</b>	<b>2022</b>
<b>Grand Total Dollar Impacts</b>	<b>\$18,166,700</b>
<b>Grand Total Income Impacts</b>	<b>\$6,789,100</b>
<b>Grand Total Employment Impacts</b>	<b>123 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$1,362,200</b>



# BELFAST MUNICIPAL AIRPORT

Belfast Municipal Airport (BST), located in the Midcoast Region of Maine, is equipped with a 4,000' by 100' asphalt runway (15/33), medium-intensity edge lights, end identifier lights, and a parallel turf landing area. Fueling with 100LL and Jet-A+ is available, and parking includes hangars and tiedowns. BST's navigational aids include a lighted wind indicator, segmented circle, FAA weather camera, and RNAV (GPS) instrument approach procedures for both runway directions.

In 2022, BST had a total of 28 single-engine aircraft and an estimated 3,200 annual aircraft operations, including 500 air taxi, 2,000 local, and 700 transient general aviation operations. BST's location and services make it a convenient air access point for emergency medical operations, recreational travel, and connections to various attractions in the area, particularly during the busy summer tourism season.

## Economic Benefits

The economic activity at Belfast Municipal Airport primarily centers around supporting the tourism industry in the region and providing aircraft maintenance service (Watts Aviation). The Airport provides a convenient access point for visitors desiring to explore summer attractions in the area, such as resorts and outdoor recreational activities. The Airport's proximity to the City of Belfast and the surrounding tourist destinations contributes to the economic vitality of the region.

In 2022, the total economic impact for Belfast Municipal Airport reached \$1.7 million, supporting 11 jobs, and contributing \$64,600 in State and local taxes.

<b>Economic Impact for Belfast Municipal</b>	
<b>Item</b>	<b>2022</b>
<b>Grand Total Dollar Impacts</b>	<b>\$1,711,200</b>
<b>Grand Total Income Impacts</b>	<b>\$526,500</b>
<b>Grand Total Employment Impacts</b>	<b>11 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$64,600</b>



# BETHEL REGIONAL AIRPORT

Bethel Regional Airport (0B1) is situated in the western Maine Lakes & Mountains Region, approximately 20 minutes from the New Hampshire border. 0B1 features a 3,818’ runway with non-precision approach capability, serving as a convenient entry point to the town with active summer tourism. It provides access to a variety of recreational destinations such as resorts, lakes, and hiking systems.

In 2022, the Airport handled approximately 4,750 operations annually. It housed 16 based aircraft, including 15 single-engine aircraft and 1 multi-engine aircraft. Its location and facilities make it an appealing destination for recreational aviation, supporting activities such as sightseeing, rafting, hiking, and other outdoor activities.

## Economic Benefits

Bethel Regional Airport serves as a gateway to the western Maine Lakes & Mountains region, a location known for its thriving tourism industry. The Airport’s proximity to various recreational destinations contributes to the economic growth and vitality of the surrounding communities, attracting visitors and supporting local businesses.

In 2022, study surveys of Airport sponsors and businesses revealed that the Airport supported 12 full- and part-time jobs and \$1.03 million in direct expenditures, including Airport capital improvements and visitor spending. Adding induced expenditures, the total economic impact for Bethel Regional Airport was \$1.48 million, supporting 16 jobs, and contributing \$97,200 in State and local taxes.

Economic Impact for Bethel Regional	
Item	2022
Grand Total Dollar Impacts	\$1,484,100
Grand Total Income Impacts	\$789,400
Grand Total Employment Impacts	16 Jobs
Estimated State and Local Taxes	\$97,200





# BIDDEFORD MUNICIPAL AIRPORT

Biddeford Municipal Airport (B19) is located within the South Coast Region of Maine. The A offers essential amenities such as 24-hour fueling with major credit cards, hangars, and tiedowns. It features a 3,000' by 75' asphalt runway in excellent condition, equipped with medium-intensity runway edge lights and a 4-light PAPI system for Runway 06.

In 2022, the Airport was home to 37 based aircraft, including 36 single-engine and 1 multi-engine aircraft. Estimated aircraft operations at the Airport included 12,400 local general aviation flights and 2,600 itinerant general aviation flights, for a total of 15,000 annual operations.

## Economic Benefits

Biddeford Municipal Airport supports economic activity through its aviation-related services and facilities, including fuel sales, aircraft maintenance, and hangar facilities. The Airport provides an air access point for emergency services, tourism/visitors, flight training, and local businesses in the region.

In 2022, the total economic impact for Biddeford Municipal Airport was \$3.01 million, supporting 18 jobs, and contributing \$133,300 in State and local taxes.

<b>Economic Impact for Biddeford Municipal</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$3,013,100</b>
<b>Grand Total Income Impacts</b>	<b>\$1,079,000</b>
<b>Grand Total Employment Impacts</b>	<b>18 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$133,300</b>



# BRUNSWICK EXECUTIVE AIRPORT

Brunswick Executive Airport (BXM) is located in the Midcoast Region near the town of Brunswick. BXM was formerly known as Brunswick Naval Air Station and was converted to a civilian airport after decommissioning. The Midcoast Regional Redevelopment Authority owns the Airport, and Flight Level Aviation serves as the fixed-base operator (FBO). BXM offers a terminal with full-service facilities and amenities, making it accessible to operators of any size. It has two 8,000’ runways and a waiting list for future hangar development.

In 2022, BXM was home to 44 based aircraft, including 43 single-engine and 1 multi-engine aircraft. Estimated aircraft operations at BXM included 5,000 local general aviation operations, 10,000 itinerant general aviation operations, and 400 military aircraft operations, for a total of 15,400 annual aircraft operations. Its runway length and landside facilities make BXM a vital Airport for attracting business aviation and transient flights from across Maine and beyond.

## Economic Benefits

Brunswick Executive Airport is a significant economic driver in the local area. Despite not currently serving commercial airlines, it facilitates various aviation-related activities. BXM hosts multiple businesses and organizations, including flight schools, aircraft maintenance services, and charter operations. Additionally, its proximity to the town of Brunswick enhances its role as a transport hub, fostering commerce and contributing to the local economy.

In 2022, the total economic impact for Brunswick Executive Airport was \$21.7 million, supporting 149 jobs, and contributing \$1.24 in State and local taxes.

<b>Economic Impact for Brunswick Executive</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$21,722,500</b>
<b>Grand Total Income Impacts</b>	<b>\$8,411,300</b>
<b>Grand Total Employment Impacts</b>	<b>149 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$1,238,500</b>



# CARIBOU MUNICIPAL AIRPORT

Located in Northern Maine, Caribou Municipal Airport (CAR) features a 4,003’ runway equipped with lighting, GPS approach capabilities, and on-airport weather reporting (ASOS). The Airport provides self-serve 100LL fueling services and operates as an Airport of Entry, offering on-call Customs and Border Protection (CBP) services. CAR has a general aviation terminal that’s available during daylight hours and by appointment after hours.

In 2022, CAR handled 3,200 operations and hosted 10 based aircraft, all of which were single-engine. The Airport serves as a landing area for medivac flights and small business aircraft, offering fueling services for 100LL and MO Gas to cater to the needs of general aviation operators.

## Economic Benefits

CAR contributes to the local economy by supporting on-airport jobs and providing air transportation connectivity to Northern Maine and the Canadian border. It facilitates medical evacuation flights and supports businesses and industries that rely on general aviation transportation in the region.

In 2022, the total economic impact for Caribou Municipal Airport was \$2.2 million, supporting 13 jobs, and contributing \$85,600 in State and local taxes.

<b>Economic Impact for Caribou Municipal</b>	
<b>Item</b>	<b>2022</b>
<b>Grand Total Dollar Impacts</b>	<b>\$2,201,900</b>
<b>Grand Total Income Impacts</b>	<b>\$607,300</b>
<b>Grand Total Employment Impacts</b>	<b>13 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$85,600</b>



# CENTRAL MAINE REGIONAL AIRPORT

Central Maine Regional Airport (OWK) is a part-time, less than 24-hour facility situated in the Kennebec and Moose River Valley Region of Maine. Owned and operated by the town, OWK boasts a 4,000’ primary runway and a 3,998’ crosswind runway and prides itself on competitive fuel prices. However, the Airport identifies funding as a significant challenge for its operations and acknowledges the need for on-site aircraft maintenance.

In 2022, OWK handled 9,820 operations and housed 28 based aircraft, comprising 27 single-engine aircraft and 1 ultralight aircraft. The Airport primarily serves the needs of general aviation.

## Economic Benefits

OWK contributes to the local economy by offering a flight school and catering to the aviation requirements of private individuals and businesses in the region, thereby promoting economic growth and development.

In 2022, the total economic impact of Central Maine Regional Airport was \$713,700, supporting 6 jobs, and contributing \$34,200 in State and local taxes.

<b>Economic Impact for Central Maine Regional</b>	
<b>Item</b>	<b>2022</b>
<b>Grand Total Dollar Impacts</b>	<b>\$713,700</b>
<b>Grand Total Income Impacts</b>	<b>\$281,900</b>
<b>Grand Total Employment Impacts</b>	<b>6 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$34,200</b>



# CHARLES A. CHASE JR. MEMORIAL **FIELD**

Charles A. Chase Jr. Memorial Field (44B) is located in Penobscot County in Central Maine. The Airport's existence today is due to successful grassroots advocacy and strong community support when a solar array development posed a threat to its continued operation. The Airport features a 2,926' turf runway, two aircraft hangars, and a wind indicator.

In 2022, the Airport handled 1,150 operations. Although no based aircraft are reported at the Airport, the facility holds significance due its use by transient aircraft and the local community's commitment to maintaining the Airport for aviation use.

## Economic Benefits

The Airport represents the value of aviation maintaining transportation connections from Central Maine to other parts of the State. The Airport serves as an access point for emergency air lift services, medevac flights, and personal transportation to and from the town of Dover-Foxcroft.

In 2022, the total economic impact of Charles A. Chase Jr. Memorial Field Airport amounted to \$120,100, supporting two jobs, and contributing \$10,900 in State and local taxes.

<b>Economic Impact for Charles A. Chase Jr.</b>	
<b>Item</b>	<b>2022</b>
<b>Grand Total Dollar Impacts</b>	<b>\$120,100</b>
<b>Grand Total Income Impacts</b>	<b>\$49,900</b>
<b>Grand Total Employment Impacts</b>	<b>2 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$10,900</b>



# DEWITT FIELD

Located in Penobscot County, Maine, Dewitt Field, Old Town Municipal Airport (OLD) operates year-round under the management of the City of Old Town. It boasts a 4,001' primary runway, a 2,750' crosswind runway, and an 8,000' seaplane base, making it suitable for small to medium-sized aircraft, and primarily serves the Old Town and surrounding communities. Facilities at the Airport include a terminal building, aircraft storage, and accessibility to the nearby University of Maine. There is a waiting list for aircraft hangars.

In 2022, the Airport recorded 26,700 operations and hosted 49 based aircraft, consisting of 37 single-engine aircraft, 1 multi-engine aircraft, and 11 helicopters. The diverse range of activities at the Airport includes aircraft maintenance and aerial mapping. Its services cater to the U.S. Flying Club, Air Guard Flying Club, and the Maine Army National Guard. The availability of aircraft maintenance services and its educational connection make OLD an essential resource for aviation training and enthusiasts.

## Economic Benefits

Dewitt Field, Old Town Municipal Airport contributes to economic activity through the services and facilities it offers. By providing aircraft maintenance and aerial mapping services, the Airport attracts businesses and individuals requiring these services. Its connection to the University of Maine stimulates collaboration and opportunities for aviation education and research. The presence of flight clubs further boosts the economic activity at the Airport.

In 2022, the total economic impact of Dewitt Field, Old Town Municipal Airport amounted to \$6.3 million, supporting 49 jobs, and contributing \$328,100 in State and local taxes.

Economic Impact for Dewitt Field	
Item	2022
Grand Total Dollar Impacts	\$6,300,500
Grand Total Income Impacts	\$3,519,200
Grand Total Employment Impacts	49 Jobs
Estimated State and Local Taxes	\$328,100



# DEXTER REGIONAL AIRPORT

Dexter Regional Airport (1B0) is a part-time facility situated in the Maine Highlands Region. Operated and owned by the Town of Dexter, the Airport features a 3,008’ asphalt runway and a 1,249’ turf crosswind runway. The Airport provides 24-hour self-serve fueling by credit card for 100LL and MOGAS. The paved runway has medium intensity edge lights and there is a lighted wind indicator which facilitates nighttime operations.

In 2022, the Airport recorded a total of 7,600 operations, including 6,400 local and 1,000 itinerant general aviation operations, and 200 military aircraft operations. The Airport is home to 22 based aircraft, all single-engine airplanes. The Airport serves local and transient pilots, and provides an access point for medevac and emergency services, including access to recreational activities at Lake Wassookeag.

## Economic Benefits

The Dexter Regional Airport stimulates economic activity through its role in air transportation services for small businesses, personal flying, and as an access point for potential lifesaving medevac flights. Economic activity includes the support of local business and recreational flying, along with on-airport fuel sales and capital maintenance spending.

In 2022, the total economic impact of Dexter Regional Airport amounted to \$2.56 million, supporting 16 jobs, and contributing \$110,800 in State and local taxes.

Economic Impact for Dexter Regional	
Item	2022
Grand Total Dollar Impacts	\$2,558,600
Grand Total Income Impacts	\$851,200
Grand Total Employment Impacts	16 Jobs
Estimated State and Local Taxes	\$110,800



# EASTERN SLOPE REGIONAL AIRPORT

Eastern Slope Regional Airport (IZG), located in the Maine Lakes & Mountains Region, is owned by the Town and managed under lease by the Eastern Slope Airport Authority (ESAA). IZG has a 4,200’ runway (14/32) with medium intensity edge lights, a visual glides slope indicator, and lighted wind indicator. Primarily serving destinations in the Mount Washington Valley Region and Conway area of New Hampshire, IZG is a gateway for personal flying, local businesses, and tourism access in these areas.

In 2022, IZG was home to 35 based aircraft, including 34 single-engine aircraft and 1 multi-engine aircraft. The Airport supported 7,850 annual aircraft operations, with 4,000 local and 3,500 itinerant general aviation operations, 200 air taxi operations, and 150 military operations. IZG differentiates itself from regional competitors through competitive fuel prices, FBO services, and flight training.

## Economic Benefits

Eastern Slope Regional Airport generates economic activity by serving the business, personal flying, and recreational destinations in the Mount Washington Valley Region. The Airport’s services, such as fuel, FBO services, and flight training, contribute to the economic ecosystem surrounding it. As an access point for medevac and emergency services, IZG supports potential lifesaving transportation infrastructure in addition to the other tourism and business functions.

In 2022, the total economic impact of Eastern Slope Regional Airport amounted to \$998,400, supporting 7 jobs, and contributing \$35,800 in State and local taxes.

<b>Economic Impact for Eastern Slope Regional</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$998,400</b>
<b>Grand Total Income Impacts</b>	<b>\$330,400</b>
<b>Grand Total Employment Impacts</b>	<b>7 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$35,800</b>





# EASTPORT MUNICIPAL AIRPORT

Eastport Municipal Airport (EPM) is located in the easternmost city in the United States. It boasts a 4,002' runway equipped with lighting, visual guidance, and a non-precision approach. The Airport offers self-serve 100LL and Jet fueling services and serves as an entry point with on-call customs and immigration services. It comprises several hangars and a general aviation terminal complete with flight planning and Wi-Fi facilities.

In 2022, EPM recorded 6,000 operations. EPM is home to 9 single-engine aircraft. The Airport's strategic location as the easternmost airport in the country makes it an important landing site. The Airport offers critical services for regional aircraft, including customs and immigration clearance. The provision of fueling services and the availability of on-site facilities underscore its significance as a stopover for general aviation traffic.

## Economic Benefits

The economic activity at Eastport Municipal Airport primarily revolves around accommodating the needs of transient aircraft and their passengers. Its facilities, including hangars and a GA terminal with amenities, are designed to cater to the needs of pilots and passengers during their stopovers. The Airport's customs services enhance its appeal as an entry point for international flights. By offering services to the aviation community and supporting businesses catering to visiting aircraft, the Airport contributes to the local economy.

In 2022, the total economic impact of Eastport Municipal Airport amounted to \$2.2 million, supporting 14 jobs, and contributing \$75,600 in State and local taxes.

<b>Economic Impact for Eastport Municipal</b>	
<b>Item</b>	<b>2022</b>
<b>Grand Total Dollar Impacts</b>	<b>\$2,199,300</b>
<b>Grand Total Income Impacts</b>	<b>\$580,800</b>
<b>Grand Total Employment Impacts</b>	<b>14 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$75,600</b>



# GREENVILLE MUNICIPAL AIRPORT

Greenville Municipal Airport (3B1) is a publicly owned facility located in the western Maine Highlands Region and is operated by the Town of Greenville. The Airport features two asphalt runways: Runway 14/32 with dimensions of 4,000’ by 75’, and Runway 3/21 with dimensions of 3,001’ by 75’. The runway surfaces are in good to excellent condition. Runway 14/32 is equipped with an RNAV approach, medium-intensity edge lighting, and visual slope indicators, with runway end identifier lights on Runway 14.

The Airport is home to 14 aircraft, including 13 single-engine airplanes and 1 multi-engine airplane. General aviation aircraft operations were estimated at 6,000 local and 6,000 itinerant operations for a total of 12,000 operations in 2022, indicating significant transient aviation activity.

## Economic Benefits

Greenville Municipal Airport supports the local economy as an essential landing site for various aviation activities and provides access to recreational destinations such as resorts, ponds/lakes, hiking trails, and vacation homes. The Airport serves emergency medical operations, business flights, recreational flying, and other general aviation activity in the Maine Highlands Region.

In 2022, the total annual economic impact for Greenville Municipal Airport amounted to \$560,100, supporting 6 jobs, and contributing \$39,100 in State and local taxes.

<b>Economic Impact for Greenville Municipal</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$560,100</b>
<b>Grand Total Income Impacts</b>	<b>\$180,100</b>
<b>Grand Total Employment Impacts</b>	<b>6 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$39,100</b>



# HOULTON INTERNATIONAL AIRPORT

Houlton International Airport (HUL) is situated along I-95 at the US/Canadian border in the Aroostook County Region and is managed by the Town of Houlton. HUL boasts a 5,015' primary runway and 2,700' crosswind runway. HUL provides Customs and Border Protection (CBP) services, including an Airport of Entry, making it an appealing choice for international flights. The Airport also offers on-site aircraft maintenance services, a GA terminal available during daylight hours, and access to 100LL and Jet-A fueling.

HUL is home to 16 single-engine aircraft, 4 multi-engine aircraft, and 1 helicopter, with a total of 21 based aircraft. Estimated aircraft operations for 2022 at HUL include 7,000 local general aviation flights, 5,000 itinerant general aviation flights, and 700 military operations, with a total of 12,700 operations.

## Economic Benefits

Houlton International Airport fuels economic activity through various services, including aircraft maintenance, fueling, and access to amenities for pilots and passengers. Its location along I-95 and its proximity to the US/Canadian border make it a strategic gateway for travelers and businesses operating between the two countries. The Airport's services and facilities contribute to the local economy by supporting aviation-related businesses and facilitating air transportation for a variety of purposes.

In 2022, the total economic impact for Houlton International Airport in 2022 was \$2.48 million, supporting 16 jobs, and contributing \$113,700 in State and local taxes.

<b>Economic Impact for Houlton International</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$2,484,900</b>
<b>Grand Total Income Impacts</b>	<b>\$793,300</b>
<b>Grand Total Employment Impacts</b>	<b>16 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$113,700</b>



# ISLESBORO AIRPORT

Islesboro Airport (57B) is located on in Maine’s Mid-Coast Region. The Airport features a 2,400’ by 50’ paved runway and a 40’ diameter asphalt helipad, both providing visual approaches for aircraft. The Airport serves as an essential landing site and facilitates aircraft operations on the island, which is celebrated for its scenic beauty and popular attractions.

The Airport reports no based aircraft and 1,150 annual aircraft operations, 94 percent of which are itinerant operations serving the island. The Airport plays an important role as a landing site on Islesboro Island, connecting residents to the mainland and providing a conduit for needed supplies, air cargo, and other important time-critical items.

## Economic Benefits

Islesboro Airport generates economic activity by its usage as a link in the supply chain for island residents. Its function is to provide access to Islesboro Island and to support the transportation needs of residents and visitors. The island's economy thrives on tourism and seasonal activities, and businesses such as restaurants, accommodations, and recreational services gain from the influx of visitors facilitated by the Airport.

In 2022, the total economic impact for Islesboro Airport in 2022 was \$93,200, supporting one job, and contributing \$7,500 in State and local taxes.

Economic Impact for Islesboro Airport	
Item	2022
Grand Total Dollar Impacts	\$93,200
Grand Total Income Impacts	\$34,500
Grand Total Employment Impacts	1 Job
Estimated State and Local Taxes	\$7,500



KNOX COUNTY REGIONAL AIRPORT

# KNOX COUNTY REGIONAL AIRPORT

Knox County Regional Airport (RKD), recognized as the fourth busiest commercial service airport in Maine, is situated in Knox County and serves Rockland and the wider Midcoast Region. This non-towered facility features a 5,412' primary runway and a 4,000' crosswind runway. The Airport provides essential connections to the island communities of Midcoast Maine, including Matinicus Isle, North Haven, and Vinalhaven. To accommodate passengers and general aviation activity, the Airport has an airline terminal, aircraft parking ramps, and general aviation hangar facilities.

In 2022, RKD enplaned 7,161 passengers and had 38,985 aircraft operations. The Airport hosts 67 based aircraft, which includes 62 single-engine, 1 multi-engine, 3 jet aircraft, and 1 glider. Cape Air offers daily scheduled service to Boston under the U.S. DOT Essential Air Service program. Penobscot Island Air provides scheduled service to the regional islands and also operates charter and seaplane flights throughout the area. RKD plays an essential role in connecting communities with both commercial and general aviation services.

## Economic Benefits

RKD supports local economic activities, predominantly driven by the Midcoast Region's tourism industry. In addition to services provided by Cape Air and Penobscot Island Air, the Airport hosts cargo operations, flight schools, and aircraft maintenance services. The Airport's close proximity to Rockland and surrounding areas benefits local industries, businesses, and attractions, serving as a gateway for visitors to explore the picturesque coastal region and thus bolstering the economic health of the community.

In 2022, the economic impact for Knox County Regional Airport totaled \$41.12 million, supporting 243 jobs, and contributing \$1.23 million in State and local taxes.

<b>Economic Impact for Knox County Regional</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$41,118,600</b>
<b>Grand Total Income Impacts</b>	<b>\$13,325,200</b>
<b>Grand Total Employment Impacts</b>	<b>243 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$1,227,900</b>



# LINCOLN REGIONAL AIRPORT

Located just 2 miles southwest of Lincoln in the Maine Highlands Region, Lincoln Regional Airport (LRG) features a 2,804' asphalt runway in good condition with medium-intensity edge lighting, non-precision markings, and runway end identifier lights. The Airport also offers a 2,400' water runway, equipped to facilitate unique outdoor recreational activities. RNAV instrument approaches are available on both Runways 17 and 35, and weather information can be accessed nearby. Self-serve 24-hour fueling services are available with major credit cards.

In 2022, LRG was home to 26 single-engine aircraft and supported 5,500 annual aircraft operations, with 4,250 operations attributed to local general aviation. 990 were related to military operations, and 260 were classified as transient general aviation operations. LRG offers the availability of hangars, tiedowns, and other basic amenities.

## Economic Benefits

LRG contributes to the local economy by serving as an access point to the Maine Highlands Region and its recreational areas, which are renowned for activities like boating, fishing, hunting, and more. An aircraft maintenance business and a seaplane float manufacturer are located at the Airport, which support local jobs and economic activity. The Town of Lincoln ensures that the Airport's facilities are maintained and ready for both recreational and business aviation users.

In 2022, the total economic impact for Lincoln Regional Airport in 2022 was \$5.31 million, supporting 29 jobs, and contributing \$225,300 in State and local taxes.

Economic Impact for Lincoln Regional	
Item	2022
Grand Total Dollar Impacts	\$5,311,900
Grand Total Income Impacts	\$1,812,600
Grand Total Employment Impacts	29 Jobs
Estimated State and Local Taxes	\$225,300



# MACHIAS VALLEY MUNICIPAL AIRPORT

Situated just one mile southwest of Machias in Downeast Maine, Machias Valley Municipal Airport (MVM) features a 2,880’ by 60’ asphalt runway in excellent condition. Runway 18-36 is equipped with medium-intensity runway edge lights, and Runway End Identifier Lights (REIL) on the Runway 36 end. Additionally, MVM offers on-airport weather reporting (AWOS) and GPS approach procedure (RNAV) on Runway 36. Fuel services (100LL) are available, along with tiedown parking, enhancing convenience for both transient and local general aviation.

In 2022, MVM was home to 3 single-engine aircraft and supported 1,200 annual aircraft operations, with 600 operations attributed to local general aviation and 600 transient general aviation operations. The Airport offers the availability of hangars, tiedowns, and other basic amenities. The 2,880’ runway, combined with the Airport’s lighting and weather reporting capabilities, promotes safe and reliable aviation access during lower visibility conditions.

## Economic Benefits

MVM’s existence enhances the local economy by ensuring access to the Machias Valley Region for general aviation and recreational purposes. Its proximity to outdoor recreational activities like fishing, hiking, and sightseeing contributes to the economic vibrancy of the surrounding area by attracting visitors and supporting related businesses.

In 2022, the total economic impact for Machias Valley Municipal Airport in 2022 was \$1.14 million, supporting 8 jobs, and contributing almost \$40,000 in State and local taxes.

<b>Economic Impact for Machias Valley Muni</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$1,143,200</b>
<b>Grand Total Income Impacts</b>	<b>\$339,000</b>
<b>Grand Total Employment Impacts</b>	<b>8 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$39,600</b>



# MILLINOCKET MUNICIPAL AIRPORT

Millinocket Municipal Airport (MLT) is a full-time facility situated in the Maine Highlands Region, just a mile southeast of Millinocket. The Airport features two asphalt runways (4,713' by 99' and 4,000' by 100') that can accommodate various aircraft types, including small business jets. MLT is municipally operated and offers amenities such as a terminal building, aircraft storage, and easy access to recreational destinations.

Millinocket Municipal Airport (MLT) is equipped to accommodate a range of aircraft with 18 fixed-wing aircraft, including 16 single-engine planes, 1 multi-engine plane, and one glider. In 2022, MLT had an estimated total of 8,400 operations annually. This included 400 air taxi operations, 6,000 local general aviation operations, 1,000 itinerant general aviation operations, and 1,000 military operations. As a gateway to diverse opportunities, the Airport's services and location make it a valuable asset for the community, catering to both business and leisure travelers.

## Economic Benefits

Millinocket Municipal Airport stimulates economic activity in the Maine Highlands Region by supporting various aviation-related businesses. The Airport's active tenants offer scenic aerial tours, skydiving, and aircraft restoration, and contribute to the local economic activity. Additionally, the Airport acts as a gateway to the area's recreational destinations, attracting visitors and supporting related businesses such as accommodations, dining establishments, and outdoor recreation providers.

In 2022, the total economic impact for Millinocket Municipal Airport in 2022 was \$1.82 million, supporting 16 jobs, and contributing \$112,700 in State and local taxes.

<b>Economic Impact for Millinocket Municipal</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$1,820,100</b>
<b>Grand Total Income Impacts</b>	<b>\$842,000</b>
<b>Grand Total Employment Impacts</b>	<b>16 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$112,700</b>





# NEWTON FIELD

Newton Field (59B), located one mile west of Jackman, serves as an access point to the Northern Kennebec & Moose River Valley Region. The Airport offers a well-maintained 3,601’ asphalt runway, equipped with medium-intensity edge lights and non-precision markings. The Airport also features a turf helipad, providing additional landing opportunities. 59B is managed by the Town of Jackman and offers 100LL fuel availability 24/7 via major credit card and parking options such as hangars and tiedowns. Instrument Approach Procedures, including RNAV (GPS) for both runways are available, which extends operational capabilities during low visibility conditions.

A total of 12 aircraft are based on the field, consisting of 11 single-engine airplanes and 1 multi-engine airplane. In 2022, the Airport had an estimated 3,500 aircraft operations, consisting of 2,500 local operations and 1,000 itinerant operations.

## Economic Benefits

Newton Field indirectly bolsters the local economy by supporting aviation-related services like fuel sales and maintenance offered by local businesses. The Airport has essential services and facilities that support recreational flying, emergency medical operations, and convenient transportation to nearby vacation homes and resorts. Moreover, the Airport enhances the accessibility of the Northern Kennebec & Moose River Valley Region, attracting visitors and subsequently benefiting businesses in the tourism and hospitality sectors.

In 2022, the total economic impact for Newton Field in 2022 amounted to \$2.61 million, supporting 15 jobs, and contributing \$81,700 in State and local taxes.

Economic Impact for Newton Field	
Item	2022
Grand Total Dollar Impacts	\$2,614,300
Grand Total Income Impacts	\$871,900
Grand Total Employment Impacts	15 Jobs
Estimated State and Local Taxes	\$81,700



# NORTHERN AROOSTOOK REGIONAL AIRPORT

Located in the northernmost part of Maine, Northern Aroostook Regional Airport (FVE) operates year-round. FVE has a 4,600' by 75' paved runway, making it suitable for a wide range of aircraft. The Airport features a general aviation terminal, hangar facilities, lighting, a GPS approach, and on-airport weather reporting (ASOS). FVE offers full-service 100LL and Jet-A fueling and has a large apron area to accommodate various aircraft operations.

In 2022, FVE had an estimated 1,300 annual aircraft operations and 9 based single-engine aircraft on the field. Given its year-round operations and facilities, FVE serves as a reliable air transportation access point in northern Maine. The Airport facilitates various aviation activities, including general aviation, business travel, recreational flying, and some cargo operations. It enhances access to the Aroostook County region, supporting transportation needs for residents, businesses, and visitors.

## Economic Benefits

FVE significantly contributes to regional economic activity by supporting aviation-related businesses and services. It offers fueling services, hangar facilities, and other amenities that cater to the requirements of pilots, passengers, and aircraft owners. The Airport bolsters commerce, trade, and tourism in the Aroostook County region by ensuring reliable air transportation options.

In 2022, the total economic impact for Northern Aroostook Regional Airport was \$1.47 million, supporting 9 jobs, and contributing \$57,300 in State and local taxes.

<b>Economic Impact for Northern Aroostook</b>	
<b>Item</b>	<b>2022</b>
<b>Grand Total Dollar Impacts</b>	<b>\$1,469,800</b>
<b>Grand Total Income Impacts</b>	<b>\$446,500</b>
<b>Grand Total Employment Impacts</b>	<b>9 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$57,300</b>



# OXFORD COUNTY REGIONAL AIRPORT

Oxford County Regional Airport (81B) is located 2 miles east of Oxford in the picturesque Maine Lakes & Mountains Region. Owned by the County, 81B is open year-round and attended Monday through Saturday. The Airport has an asphalt runway measuring 2,997' by 75', medium intensity edge lights, and RNAV approaches to both runway ends (15 and 33). 81B is equipped with 24-hour self-service 100LL fuel availability, and major airframe and powerplant services.

In 2022, the Airport had an estimated 22 based aircraft, including 20 single-engine airplanes and 2 multi-engine airplanes. Estimated aircraft operations totaled 9,030, with 6,000 local, 3,000 itinerant, and 30 air taxi operations.

## Economic Benefits

Through the services offered by Mosher Aviation, Oxford County Regional Airport significantly contributes to the region's economic activity. The operations of the FBO, including maintenance, painting, and storage, create business and employment opportunities. Furthermore, the Airport's location close to the Maine Lakes & Mountains Region bolsters tourism and recreational activities, which in turn benefits local businesses such as accommodation facilities, restaurants, and outdoor adventure service providers.

In 2022, the total economic impact for Oxford County Regional Airport amounted to \$2.6 million, supporting 26 jobs, and contributing \$177,100 in State and local taxes.

Economic Impact for Oxford County	
Item	2022
Grand Total Dollar Impacts	\$2,598,900
Grand Total Income Impacts	\$1,266,400
Grand Total Employment Impacts	26 Jobs
Estimated State and Local Taxes	\$177,100



# PITTSFIELD MUNICIPAL AIRPORT

Located centrally in the State of Maine, Pittsfield Municipal Airport (2B7) has a 4,003' by 100' asphalt runway equipped with medium-intensity runway edge lights, a 4-light PAPI system on Runway 36, and Runway End Identifier Lights (REIL) for both runways. Instrument Approach Procedures include RNAV (GPS) for both runways 18 and 36, ensuring navigational support. The Airport offers a wide array of services such as major airframe and powerplant service, 100LL and Jet-A+ fuel availability, and hangars and tiedowns for parking.

In 2022, the Airport had an estimated 33 based aircraft, including 28 single-engine airplanes and 5 multi-engine airplanes. Estimated aircraft operations totaled 16,100, with 8,000 local, 5,000 itinerant, 5,000 military, and 100 air taxi operations. The Airport serves as a vital transportation hub in the region for both civilian and military aviation.

## Economic Benefits

Pittsfield Municipal Airport contributes to the region's economic activity via services offered by Curtis Air, the Airport's FBO. The provision of maintenance, fueling, and other aviation-related services supports local businesses and creates job opportunities. Additionally, the Airport supports Central Maine Aviation (flight school) and the Cianbro Flight Department. The Airport's accessibility also enhances military aviation training from nearby Bangor Air National Guard.

In 2022, the total impact for Pittsfield Municipal Airport is \$7.44 million, supporting 33 jobs, and contributing 360,500 in State and local taxes.

<b>Economic Impact for Pittsfield Municipal</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$7,440,200</b>
<b>Grand Total Income Impacts</b>	<b>\$4,454,800</b>
<b>Grand Total Employment Impacts</b>	<b>33 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$360,500</b>



# PORTLAND INTERNATIONAL **JETPORT**

As Maine's flagship commercial service airport, Portland International Jetport (PWM) serves the state's largest city and its surrounding metropolitan area. This towered Airport has modern, environmentally sustainable facilities, including an expanded terminal building, which houses the state's largest geothermal heating and cooling system. PWM offers a full array of amenities and services to accommodate the needs of travelers, including terminal concessions, rental cars, parking, and restaurants.

In 2022, PWM had 982,834 enplanements and 54,880 aircraft operations, making it the busiest airport in Maine. PWM is serviced by a diverse mix of air carriers, including American Airlines, Breeze Airways, JetBlue, Delta, Frontier Airlines, Southwest, Sun Country, and United. These airlines offer flights to 14 cities plus additional destinations on a seasonal basis.

## Economic Benefits

PWM plays a vital role in driving economic activity locally and in the state at large. The Airport supports a broad array of businesses and services, including car rental agencies, concessionaires, Airport operations staff, and security personnel. PWM also benefits from its strategic location as a gateway to the city of Portland and its surrounding areas. The Airport's robust passenger traffic and connections to various destinations attract visitors, businesses, and industries, stimulating economic growth, tourism, and commerce in Maine.

In 2022, the economic impact for Portland International Jetport totaled \$1.18 billion, supporting 10,007 jobs, and contributing \$86.52 million in State and local taxes.

<b>Economic Impact for Portland International</b>	
<b>Item</b>	<b>2022</b>
<b>Grand Total Dollar Impacts</b>	<b>\$1,175,466,500</b>
<b>Grand Total Income Impacts</b>	<b>\$479,495,300</b>
<b>Grand Total Employment Impacts</b>	<b>10,007 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$86,521,600</b>



# PRESQUE ISLE INTERNATIONAL AIRPORT

Presque Isle International Airport (PQI) is the state's fourth busiest airport. Serving a vast expanse of northern Maine and northwestern New Brunswick, Canada, this non-towered facility features a 7,441' primary runway and a 6,000' crosswind runway that can accommodate a variety of aircraft. The Airport's facilities include a terminal building and the expansive Skyway Industrial Park, home to numerous aeronautical and nonaeronautical businesses. PQI serves as an essential hub for medical evacuation flights and provides emergency services to remote regions.

In 2022, PQI had 10,846 enplanements and 7,388 aircraft operations. The Airport, acting as the primary gateway for travelers in the region, offers daily scheduled commercial service operated by CommutAir, under the banner of United Express. Flights connect PQI to Newark Liberty International Airport, enabling easy air travel options for both residents and visitors. The Airport hosts 18 based aircraft, with 16 single-engine aircraft, 1 multi-engine aircraft and 1 jet contributing to the general aviation activity and services at PQI.

## Economic Benefits

PQI plays a vital role in stimulating economic activity in the region. Alongside commercial airline operations, the Airport's proximity to the Skyway Industrial Park nurtures the growth of aeronautical and non-aeronautical businesses. These businesses generate employment opportunities, adding value to the local economy. Moreover, the Airport serves as a crucial link for the transportation of goods and facilitates trade between northern Maine and northwestern New Brunswick.

In 2022, the total economic impact for Presque Isle International Airport reached \$83.5 million, supporting 358 jobs, and contributing \$23.62 million in State and local taxes.

### Economic Impact for Presque Isle Int.

Item	2022
<b>Grand Total Dollar Impacts</b>	<b>\$83,501,100</b>
<b>Grand Total Income Impacts</b>	<b>\$29,443,900</b>
<b>Grand Total Employment Impacts</b>	<b>358 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$23,621,200</b>



# PRINCETON MUNICIPAL AIRPORT

Princeton Municipal Airport (PNN) is located 2 miles south of Princeton, in the Downeast & Acadia Region near the Canadian border. PNN has one functional asphalt runway which is 4007' by 75' (15/33) and in excellent condition. It is equipped with medium-intensity runway edge lights, a 4-light PAPI on Runway 15. PNN also offers self-serve 100LL and Jet fueling services and several hangars. Its general aviation terminal provides flight planning and Wi-Fi access. PNN is classified as a customs landing rights airport, offering a gateway for pilots crossing the Canadian border and serving various other needs, including recreational flying and emergency medical operations.

In 2022, PNN had 1 single-engine based aircraft. Estimated aircraft operations totaled 2,330, with 700 local, 1,200 itinerant, 350 military, and 80 air taxi operations. The Airport serves as an access point near the Canadian border for both civilian and military aviation.

## Economic Benefits

PNN is important to the region, being used for medevac and emergency response purposes. Both law enforcement and military aviation are supported by the Airport, along with business and personal flying. The Airport indirectly contributes to the local economy through its transportation access services, supporting pilots and aircraft owners, encouraging aviation-related activities in the region.

In 2022, the total impact for Princeton Municipal Airport is \$1.92 million, supporting 13 jobs, and contributing \$66,300 in State and local taxes.

Economic Impact for Princeton Municipal	
Item	2022
Grand Total Dollar Impacts	\$1,915,600
Grand Total Income Impacts	\$543,200
Grand Total Employment Impacts	13 Jobs
Estimated State and Local Taxes	\$66,300



# SANFORD SEACOAST REGIONAL AIRPORT

Sanford Seacoast Regional Airport (SFM) is located in the Southcoast Region and managed by the City of Sanford. SFM operates with two runways: a 6,389’ primary asphalt runway (07/25) and a 4,999’ crosswind asphalt runway (14/32). The primary runway features high-intensity edge lights and an ILS approach, while the crosswind runway has medium intensity lighting. SFM offers fuel service (100LL, Jet-A, MOGAS), hangars, tiedowns, and major airframe and powerplant maintenance services. SFM offers free parking and various amenities in its terminal building, which adds to its draw of regional customers.

In 2022, SFM had an estimated 125 based aircraft, including 99 single-engine airplanes, 9 multi-engine airplanes, 2 jets, 11 helicopters, 3 gliders, and 1 ultralight. Estimated aircraft operations totaled 36,700, with 28,000 local, 7,100 itinerant, 100 military, and 1,500 air taxi operations. The Airport serves as a vital transportation hub in the region for business, emergency healthcare, flight training, personal flying, and military aviation.

## Economic Benefits

As a reliever Airport for the larger Portland International Jetport (PWM), SFM attracts itinerant and based users, including private and corporate aircraft operators. The FBO, Southern Maine Aviation, provides a full array of services including: Flight School, Maintenance, Testing Center, Aircraft Storage and Parking, Aerial Tours, and Fueling Services. Pine Tree Helicopters provides flight instruction and aerial tours. SFM is also home to a LifeFlight medevac base, with up to 15 employees. Numerous other businesses on the Airport provide jobs and amenities to support economic activity in the Southcoast Region.

In 2022, Sanford Seacoast Regional Airport's total economic impact was \$15.03 million, supporting 110 jobs, and contributing almost \$1 million in State and local taxes.

<b>Economic Impact for Sanford Seacoast</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$15,032,100</b>
<b>Grand Total Income Impacts</b>	<b>\$6,242,400</b>
<b>Grand Total Employment Impacts</b>	<b>110 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$986,100</b>





# STEPHEN A. BEAN MUNICIPAL AIRPORT

Stephen A. Bean Municipal Airport (8B0) is located 2 miles northwest of Rangeley, in the Maine Lakes & Mountains Region. 8B0 is open year-round and offers self-service 100LL and Jet-A fuel. Asphalt Runway 14/32 is 4,299' by 75' and is in excellent condition. It is equipped with medium-intensity runway edge lights, runway end identifier lights, and a 4-light PAPI system on both ends to assist pilots with their approach.

In 2022, the Airport had 5 single-engine based aircraft. Estimated aircraft operations totaled 2,600, with 1,200 local, 1,200 itinerant, 150 military, and 50 air taxi operations. The Airport serves as an access point in the Maine Lakes & Mountains Region for business, emergency healthcare, personal flying, and military aviation.

## Economic Benefits

Stephen A. Bean Municipal Airport indirectly contributes to the local economy by supporting general aviation activities, including aerial sightseeing, charter seaplanes, fueling services, and other aviation activities. The Airport's location northwest Maine provides access to recreational areas for visitors and supports the local tourism industry.

In 2022, Stephen A. Bean Municipal Airport's total economic impact amounted to \$4.69 million, supporting 30 jobs, and contributing \$157,100 in State and local taxes.

Economic Impact for Stephen A. Bean Muni.	
Item	2022
Grand Total Dollar Impacts	\$4,692,800
Grand Total Income Impacts	\$1,331,600
Grand Total Employment Impacts	30 Jobs
Estimated State and Local Taxes	\$157,100



# STONINGTON MUNICIPAL AIRPORT

Stonington Municipal Airport (93B) is located at the southern end of Deer Island in Hancock County in Downeast Maine. It features a single asphalt runway, 7/25, measuring 2,099’ by 60’, which is in good condition. The Airport also has a 40’ by 40’ helipad with an asphalt surface. As an island Airport, services are minimal and the main function of the Airport is to provide an air access point for visitors, supplies, and emergency services, when needed. The island is well known for its scenic beauty, fishing villages, and vibrant arts community and is connected to the mainland by a suspension bridge.

In 2022, the Airport had 2 single-engine based aircraft. Estimated aircraft operations totaled 1,100, with 700 local and 400 itinerant operations. The Airport serves as an access point for Deer Island for business, emergency healthcare, and personal flying.

## Economic Benefits

Stonington Municipal Airport contributes to the local economy by supporting general aviation activities and emergency response operations. The Airport indirectly fosters economic activity by facilitating access to Stonington and its surrounding attractions. Its proximity to popular tourist destinations, such as the Penobscot Bay region can benefit local businesses such as inns, rental homes, restaurants, and recreational service providers.

In 2022, the total economic impact for Stonington Municipal Airport was estimated at \$24,800, and contributed \$1,800 in State and local taxes.

<b>Economic Impact for Stonington Municipal</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$24,800</b>
<b>Grand Total Income Impacts</b>	<b>\$12,500</b>
<b>Grand Total Employment Impacts</b>	<b>&lt;1 Job</b>
<b>Estimated State and Local Taxes</b>	<b>\$1,800</b>



# SUGARLOAF REGIONAL AIRPORT

Sugarloaf Regional Airport (B21) is located in Carrabassett Valley, in the Western Mountains Region of Maine. The Airport serves local aviators and itinerant visitors seeking outdoor recreational opportunities, including Sugarloaf Mountain, one of the largest ski resorts in the state. B21 has a 2,797' by 75' asphalt runway in good condition, apron area, and hangar facilities. B21 has self-serve 100LL and MOGAS fuel, as well as tiedown parking. In addition, the Airport has a circling instrument approach (RNAV (GPS)-A).

In 2022, Sugarloaf Regional Airport had 13 single-engine based aircraft. Estimated aircraft operations totaled 6,000, with 3,500 local and 2,500 itinerant operations. The Airport serves as an access point for Sugarloaf Mountain, and other local destinations. The Airport accommodates aviation for tourism, business, emergency healthcare, and personal flying.

## Economic Benefits

B21 indirectly contributes to the local economy by improving accessibility to the Carrabassett Valley and the nearby Sugarloaf Mountain, a popular tourist destination. Consequently, it plays a supportive role for local tourism and recreational businesses. Visitors who utilize the Airport contribute to the local economy when they patronize local accommodations, restaurants, and other services.

In 2022, the total economic impact for Sugarloaf Regional Airport was found to be \$1.2 million, supporting 10 jobs and contributing \$72,200 in State and local taxes.

Economic Impact for Sugarloaf Regional	
Item	2022
Grand Total Dollar Impacts	\$1,196,400
Grand Total Income Impacts	\$477,800
Grand Total Employment Impacts	10 Jobs
Estimated State and Local Taxes	\$72,200



# WATERVILLE ROBERT LAFLEUR AIRPORT

Waterville Robert LaFleur Airport (WVL) is conveniently located in Kennebec County in the Moose River Valley Region. WVL has a primary runway (5/23) that is 5,500' by 100' and a crosswind runway (14/32) that is 2,301' by 60'. Runway 5/23 has high-intensity runway edge lights and precision approach capabilities including ILS/DME and RNAV (GPS) approaches. WVL features amenities such as a general aviation terminal, hangars, tiedowns, and fueling services for 100LL and Jet-A+.

In 2022, B21 had 20 based aircraft consisting of 18 single-engine and 2 multi-engine aircraft. Estimated aircraft operations totaled 16,200, with 8,000 local, 8,000 itinerant, and 200 military operations. The Airport serves as an access point for central Maine, only 25 miles north of the Capital, Augusta. The Airport accommodates aviation for tourism, business, emergency healthcare, military, and personal flying.

## Economic Benefits

Waterville Robert LaFleur Airport contributes significantly to the economic vibrancy of the Kennebec and Moose River Valley Region. It supports a variety of businesses and services, including aircraft maintenance, flight training, seasonal skydiving, fuel sales, and ground handling operations. Its strategic location near major transportation routes and Waterville enhances accessibility for local and transient users, stimulating economic opportunities for surrounding businesses such as hotels, restaurants, and transportation services.

In 2022, the total economic impact for Waterville Robert LaFleur Airport was found to be \$6.59 million, supporting 49 jobs in total, and contributing 348,800 in State and local taxes.

<b>Economic Impact for Waterville Robert LaFleur</b>	
<i>Item</i>	<i>2022</i>
<b>Grand Total Dollar Impacts</b>	<b>\$6,593,500</b>
<b>Grand Total Income Impacts</b>	<b>\$2,711,600</b>
<b>Grand Total Employment Impacts</b>	<b>49 Jobs</b>
<b>Estimated State and Local Taxes</b>	<b>\$348,800</b>



# WISCASSET AIRPORT

Wiscasset Airport (IWI) is located Lincoln County in the Midcoast Region of Maine. Wiscasset – with many early architecture buildings – is often referred to as "The Prettiest Village in Maine" and offers a mix of historic charm and natural beauty. Although open year-round, IWI is unattended from January to March. The Airport offers regular hours of attendance throughout the rest of the year. IWI features a single asphalt runway, 07/25, which is 3,397' by 75', with medium intensity edge lights. IWI offers 24-hour credit card fuel operations for 100LL and Jet-A fuel types and provides hangars and tiedowns for aircraft parking.

In 2022, IWI had 31 aircraft, including 28 single-engine planes, 2 multi-engine airplanes, and a helicopter. Estimated aircraft operations totaled 7,200, with 3,800 local, 3,100 itinerant, 25 military, and 275 air taxi operations. The Airport serves as an access point for the Midcoast Region and its popular destinations for tourists seeking maritime experiences, historical sites, scenic coastal views, and Maine's renowned seafood. The Airport accommodates aviation for tourism, business, emergency healthcare, and personal flying.

## Economic Benefits

Wiscasset Airport brings economic value to the region through its air transportation function. In 2022, the total economic impact was found to be \$1.61 million, supporting a total of 11 jobs, and contributing \$56,800 in State and local taxes.

Economic Impact for Wiscasset Airport	
Item	2022
Grand Total Dollar Impacts	\$1,611,700
Grand Total Income Impacts	\$501,800
Grand Total Employment Impacts	11 Jobs
Estimated State and Local Taxes	\$56,800