



FINAL

NEPA ENVIRONMENTAL ASSESSMENT

PLYMOUTH MUNICIPAL AIRPORT Extensions to Runway 6-24, Taxiway A, and Taxiway E and 5-year Capital Improvement Plan

PLYMOUTH, MA

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This Environmental Assessment becomes a Federal document when evaluated, signed, and dated by the Responsible FAA Official.

Responsible FAA Official: _____ Date: _____

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**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
NEW ENGLAND REGION**

**FINDING OF NO SIGNIFICANT IMPACT
AND
RECORD OF DECISION**

**Extensions to Runway 6-24, Taxiway A, and Taxiway E
and 5-year Capital Improvement Plan
at
Plymouth Municipal Airport**

Plymouth Municipal Airport (PYM)
Plymouth, Massachusetts



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GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT IS IN THIS DOCUMENT?

This document is the Federal Aviation Administration's (FAA) Finding of No Significant Impact (FONSI) and Record of Decision (ROD) for the proposed Extensions to Runway 6-24/Taxiway A/Taxiway E and 5-year Capital Improvement Plan at Plymouth Municipal Airport (PYM or "the Airport") in the towns of Plymouth and Carver in Plymouth County, Massachusetts. This document includes the agency determinations and approvals for those proposed Federal actions described in the Final Environmental Assessment (EA) dated January 17, 2025. This document discusses all alternatives considered by FAA in reaching its decision, summarizes the analysis used to evaluate the alternatives, and briefly summarizes the potential environmental consequences of the Proposed Action (Preferred Alternative) and the No Action Alternative, which are evaluated in this FONSI/ROD.

BACKGROUND.

The Plymouth Airport Commission (PAC) and Plymouth Municipal Airport (Airport) propose minimal runway and taxiway extensions, airfield navigational instrument relocation, two hangars, and airfield infrastructure (sewer line extension and backup generator based on findings in the 2022 Technical Master Plan Update. The EA was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) [Public Law 91-190, 42 USC 4321-4347], the implementing regulations of the Council on Environmental Quality (CEQ) [Title 40, Code of Federal Regulations (C.F.R.) Parts 1500-1508], and FAA Orders 1050.1F, *Environmental Impacts: Policies and Procedures* and 5050.4B, National Environmental Policy Act (NEPA) *Implementing Instructions for Airport Actions*. The FAA is aware of the November 12, 2024, decision in *Marin Audubon Society v. Federal Aviation Administration*, No. 23-1067 (D.C. Cir. Nov. 12, 2024). To the extent that a court may conclude that the Council on Environmental Quality (CEQ) regulations implementing NEPA are not judicially enforceable or binding on this agency action, the FAA has elected to follow those regulations at 40 CFR parts 1500–1508, in addition to the FAA's policies and procedures implementing NEPA at FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (July 16, 2015), to meet the agency's obligations under NEPA, 42 U.S.C. §§ 4321 et seq.

WHAT SHOULD YOU DO?

Read the FONSI/ROD to understand the actions that FAA intends to take relative to the proposed improvements at BDL.

WHAT HAPPENS AFTER THIS?

The Airport may begin to implement the Proposed Action (Preferred Alternative).

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT AND RECORD OF DECISION
EXTENSIONS TO RUNWAY 6-24 TAXIWAY A/E AND 5-YEAR CAPITAL IMPROVEMENT PLAN

1. Introduction.

The Federal Aviation Administration (FAA) prepared this Finding of No Significant Impact and Record of Decision (FONSI/ROD) for the Environmental Assessment (EA) analyzing the proposed Extensions to Runway 6-24, Taxiway A, and Taxiway E and 5-year Capital Improvement Plan Plymouth Municipal Airport (PYM) in Plymouth, MA. The EA was prepared in accordance with the guidelines and requirements set forth by the Council on Environmental Quality (CEQ) and the FAA to implement the environmental review and disclosure provisions of the National Environmental Policy Act of 1969 (NEPA). In accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, and based on the evaluation in the Final EA, there are no significant impacts associated with the proposed project. Therefore, a Federal Environmental Impact Statement will not be prepared, and a FONSI/ROD is being issued. This FONSI/ROD provides a review of the Proposed Project, mitigation, and the basis for the FAA's finding. Project details are included in the EA.

The FAA is aware of the November 12, 2024, decision in *Marin Audubon Society v. Federal Aviation Administration*, No. 23-1067 (D.C. Cir. Nov. 12, 2024). To the extent that a court may conclude that the Council on Environmental Quality (CEQ) regulations implementing NEPA are not judicially enforceable or binding on this agency action, the FAA has elected to follow those regulations at 40 CFR parts 1500–1508, in addition to the FAA's policies and procedures implementing NEPA at FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (July 16, 2015), to meet the agency's obligations under NEPA, 42 U.S.C. §§ 4321 et seq.

2. Purpose and Need

Chapter 2 of the Final EA describes the purpose and need for the proposed project. The purpose of the Proposed Project is to address the operational needs of the existing fleet at the airport. The need for the Proposed Project is to:

- 1) Increase runway length to improve operability of the existing aircraft
- 2) Create a parallel taxiway to reduce conflicts between aircraft
- 3) Reposition NAVAIDS associated with the extension.

3. FAA Actions

FAA will take the following actions to authorize implementation of the proposed projects:

- Unconditional approval of the Airport Layout Plan (ALP) depicting the proposed improvements pursuant to Title 49 U.S.C. 40103(b), *Sovereignty and Use of Airspace*, 44718, *Structures Interfering with Air Commerce or National Security*, and 47107(a)(16), *Project Grant Application Approval Conditioned on Assurances about Airport Operations*; Title 14, C.F.R. Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*; and 14 C.F.R. Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*;
- Determinations under Title 49 U.S.C. § 47106, *Project Grant Application Approval Conditioned on Satisfaction of Project Requirements*, and § 47107, *Project Grant Application Approval Conditioned on Assurances about Airport Operations*, relating to the eligibility of the Proposed Action for federal funding under the Airport Improvement Program (AIP) and/or under Title 49 U.S.C. § 40117, *Passenger Facility Charges*, as implemented by 14 C.F.R. § 158.25, *Applications*, to impose and use passenger facility charges (PFCs) collected at the Airport for the Proposed Action to assist with construction of potentially eligible development items shown on the ALP; and

- If necessary, approval of a construction safety and phasing plan to maintain aviation and airfield safety during construction pursuant to FAA Advisory Circular 150-5370-2F, *Operational Safety on Airports During Construction*, under 14 C.F.R. Part 139, *Airport Certification* (49 U.S.C. § 44706, *Airport Operating Certificates*).

4. Reasonable Alternatives Considered

The following alternatives were considered as part of the evaluation process:

ACTION	ALT 1 No Action/ Existing Condition	ALT 2 Preferred Alternative	ALT 3	ALT 4
Runway 6 Approach Length	Do Nothing	351' x 75'	550' x 75'	850' x 75'
Taxiway A	Do Nothing	1000' x 35'	1199' x 35'	1499' x 35'
Taxiway E	Do Nothing	700' x 35'	899' x 35'	1199' x 35'
NAVAIDS:				
MIRL	Do Nothing	Relocate	Relocate	Relocate
MALSF	Do Nothing	Relocate	Relocate	Relocate
PAPI	Do Nothing	Relocate	Relocate	Relocate
Glideslope	Do Nothing	Relocate	Relocate	Relocate
Fence	Do Nothing	Do not relocate	Likely to relocate	Likely to relocate
Driveway	Do Nothing	Do not relocate	Likely to relocate	Likely to relocate
Obstructions (Tree Removal)	Do Nothing	0	1-group current; 5-groups in near future	8-groups current; additional in future
Property Acquisitions/ Easements	Do Nothing	None/0	3	4
MIRL – Medium Intensity Approach Light System MALSF – Medium Intensity Light System w/Sequenced Flashing Lights PAPI – Precision Approach Path Indicator				

5. Assessment.

The potential environmental impacts and possible adverse effects were identified and evaluated in the EA. The FAA determined that the Final EA for the proposed project adequately describes the potential impacts of the Proposed Action (Preferred) Alternative. Public comments on the Draft EA were taken into consideration. As outlined FAA Order 1050.1F Section 6-1, concise analysis was undertaken only for the no action and the proposed action. The table below summarizes the conclusions found in the EA for only the environmental categories with impacts resulting from the Proposed Project.

Environmental Impact Category	Findings
Air Quality	PYM is an attainment area and therefore General Conformity does not apply. The proposed action will have little effect on air traffic volume and will have minor effects on air traffic patterns and is not expected to have an adverse effect on air quality. Temporary air quality impacts during construction periods will be reduced with Best Management Practices.
Biological Resources	Project would not alter suitable habitats for federally listed species, pursuant to Section 7 of the ESA, the FAA finds that the Proposed Action would have no effect on the Northern Long-eared Bat or Plymouth Redbelly Turtle. A total of 2.49 acres of Priority Habitat for state-listed bird species will be permanently altered by the proposed projects which will be mitigated by placing additional Airport property under management.
Climate Change	The Proposed Action is not anticipated to substantially increase the number of aircraft using the Airport. Overall operations are expected to remain at similar levels. The addition of pavement is not anticipated to result in impacts that would lessen the Airport's ability to remain resilient to future climate impacts.
Haz Materials, Solid Waste, and Pollution Prevention	The Proposed Action is not anticipated to result in the release of hazardous materials and is not anticipated to generate hazardous waste. Construction of the Proposed Action would generate normal levels of construction waste. BMPs will be in place to avoid pollution impacts.
Land Use	The proposed alternatives would occur largely on Airport property, and there would be no direct takings of land or land acquisition.
Natural Resources & Energy Supply	The Proposed Action would not affect the energy use from electricity, heating oil, and propane/fuel beyond the temporary impact from construction activities. The Proposed Action will have no significant effect on energy consumption at the airport, nor will the use of any rare materials or natural resources in short supply.
Water Resources: Surface Waters Groundwater	Potential surface water quality impacts would be mitigated through effective stormwater management and soil erosion and sediment control measures implemented as part of the design process, in accordance with all governing local, state and federal requirements and oversight during any construction. Erosion and Sediment Control Plans will need to be approved by the governing municipalities (Plymouth and/or Carver) and/or other governing agencies prior to any construction activities. The increase in impervious surfaces may alter the natural recharge of the aquifer, potentially reducing the quantity of groundwater available for extraction and impacting the sustainability of the water supply. The conceptual stormwater system has been developed in accordance with MassDEP Stormwater Management Standards. The conceptual stormwater treatment system includes 50-foot wide vegetative filter strips, swales, sediment forebays, grassed channels and infiltration ponds to provide TSS removal, prior to discharge into infiltration basins. The infiltration basins were sized larger than the requirements for water quality volume and recharge. Sediment forebays were sized greater than the requirements. Infiltration basin designs were checked against all storm sizes (i.e., current 100-year, 2050 10-year and 2070 25-year) and met the standard for no increase in runoff. The Proposed Action would NOT directly impact wetlands or buffers.
Noise and Noise-Compatible Land Use	The contours associated with operations remain within the Airport property boundary at the Runway 6 extension end. Short-term noise impacts due to the Proposed Action over the course of the three-year construction window (2024-2026) will be limited to temporary impacts associated with construction activities.

Environmental Impact Category	Findings
Socioeconomics, Environmental Justice, Children's Environmental Health & Safety	All work is primarily for safety improvements and not to facilitate substantial increased Airport operations or cause substantial growth or change the type or size of aircraft using the Airport. Impacts on nearby communities and other potential socioeconomic impacts are not expected. There are no disproportionate impacts to Environmental Justice communities. The Project will not modify existing Airport uses and will not modify environmental health or safety risks

6. Public Participation

The Draft EA/Draft EIR was available for review by the public, government agencies, affected property owners, and interested parties for a period of 60 days (starting November 8, 2023). The Notice of Availability of the Draft EA was published on Thursday September 12, 2024, in the MEPA eMonitor (#16692).

7. Inter-Agency Coordination

The FAA coordinated with the State Historic Preservation Officer (SHPO) and local Tribes, US Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), MA Department of Environmental Protection (MA DEP).

8. Mitigation Measures

Consistent with applicable orders, policies, and guidance, including CEQ Guidance, the FAA understands that the Airport will undertake the necessary actions to ensure that conditions and/or mitigation measures are undertaken and that it will monitor the implementation and effectiveness of such measures. In some instances, the conditions are required as a result of coordination and agreement. As with all projects subject to NEPA, should any conditions change or impacts be discovered that require further NEPA analysis, the FAA will require that a supplemental analysis, review, and decision be conducted. To ensure impacts remain at or below less-than-significant adverse levels, effects would be minimized and reduced through the implementation of mitigation measures, such as:

- **Biological Resources.** The Airport has initiated preliminary consultation with the NHESP and intends to request a Certificate of Permit Compliance. As part of the mitigation efforts, the Airport proposes to update the existing Airport-wide Grassland Habitat Management Plan (2018) in order to improve upon the comprehensive mitigation strategy that will not only provide a net benefit to the species of concern (upland sandpiper, grasshopper sparrow, vesper sparrow, and eastern meadowlark), but enable the Airport to develop Airport projects with the agreement of mitigation factors already completed. This GHMP will be submitted as part of the amended and renewed Conservation and Management Permit (CMP) application for this Project. To compensate for the Project's unavoidable alteration of state-listed species habitat, the Airport proposes to place additional Airport property under conservation management to improve the land's habitat functions for the state-listed species that occur on the site. The Airport has acreage in a "mitigation bank" and intends to utilize that to meet the performance standards of the CMP.

9. Reasons for the Determination that the Preferred Alternative will have No Significant Impacts.

The attached Final EA examines each of the various environmental resources that were deemed present at the project location or had the potential to be impacted by the Proposed Action Alternative. Extensions to Runway 6-24/Taxiway A/Taxiway E and 5-year Capital Improvement Plan projects would not involve any environmental impacts that would exceed a threshold of significance as defined by FAA Orders 1050.1F and 5050.4B. Based on the information contained in the Final EA, the FAA has

determined the Proposed Action (preferred alternative), is the most feasible and prudent alternative and will undertake the necessary authorizations for the project to move forward.

10. Finding off No Significant Impact

After careful and thorough consideration of the facts contained herein, the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in Section 101 of NEPA and other applicable environmental requirements and will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102(2)(C) of NEPA.

APPROVED:

Cheryl Quaine
Environmental Program Manager
Federal Aviation Administration, New England Region

Date

11. Record of Decision and Order

I have carefully considered the FAA's statutory mandate to ensure the safe and efficient use of the national airspace system as well as the other aeronautical goals and objectives discussed in the Final EA. My review of the Final EA and determination regarding issuance of the FONSI/ROD included evaluation of the purpose and need that this proposed action would serve, the alternate means of achieving the purpose and need, the environmental impacts associated with these alternatives, and any mitigation necessary to preserve and enhance the human, cultural, and natural environment. Under the authority delegated to me by the FAA Administrator, I find the FAA Proposed Action described in the attached Final EA is reasonably supported. I, therefore, direct that action be taken to carry forward the necessary agency actions discussed in the attached Final EA and this FONSI/ROD.

APPROVED:

Cheryl Quaine
Environmental Program Manager
Federal Aviation Administration, New England Region

Date

RIGHT OF APPEAL

This FONSI/ROD presents the Federal Aviation Administration's findings and final decision and approvals for the actions identified, including those taken under the provisions of Title 49 of the United States Code, Subtitle VII, Parts A and B. Any party having a substantial interest may appeal this order to the United States Court of Appeals for the District of Columbia Circuit or in the court of appeals of the United States for the circuit in which the person resides or has its principal place of business, upon petition filed within 60 days after entry of this order in accordance with 49 U.S.C. § 46110. Any party seeking to stay the implementation of this ROD must file an application with the FAA prior to seeking judicial relief, as provided in Rule 18(a) of the Federal Rules of Appellate Procedure.

**PLYMOUTH MUNICIPAL AIRPORT
RUNWAY 6-24 AND TAXIWAYS E AND A EXTENSIONS
& 5-YEAR CAPITAL IMPROVEMENT PLAN**

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A	AC	Advisory Circular
	ADG	Aircraft Design Group
	AEDT	Aviation Environmental Design Tool
	AMSL	Above Mean Sea Level
	ALP	Airport Layout Plan
	ARC	Airport Reference Code
	ASA	Airport Service Area
	ATCT	Air Traffic Control Tower
	AWOS	Automated Weather Observing System
B	BMP	Best Management Practice
C	CAA	Clean Air Act
	CEQ	Council on Environmental Quality
	CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
	CFR	Code of Federal Regulations
	CGP	Construction General Permit
	CIP	Capital Improvement Plan
	CISA	Climate-Informed Science Approach
	CLS	Conservation Land Stewardship Program
	CWA	Clean Water Act
D	CY	Cubic Yards
	dB	Decibel
	DGA	Designated Geographic Area
E	DNL	Day Night Average Sound Level
	EA	Environmental Assessment
	EEA	Massachusetts Executive Office of Energy and Environmental Affairs
	EIR	Environmental Impact Report
	EJ	Environmental Justice
	ESA	Endangered Species Act
	EPA	US Environmental Protection Agency
F	FAA	Federal Aviation Administration
	FAR	Federal Aviation Regulations
	FBO	Fixed Base Operator
	FEMA	Federal Emergency Management Agency
	FFRD	Future of Flood Risk Data
	FFPA	Farmland Protection Policy Act
	FFRMS	Federal Flood Risk Management Standard
	FIRM	Flood Insurance Rate Map
	FONSI	Finding of No Significant Impact
	FPPA	Farmland Protection Policy Act
	FVA	Freeboard Value Approach
	FWCA	Fish and Wildlife Coordination Act
G	GA	General Aviation
	GP	[USACE Massachusetts] General Permit
I	ILS	Instrument Landing System
	INM	Integrated Noise Model
	ISR	Indirect Source Review
L	LF	Linear Feet
	LID	Low Impact Design

M	MPU	Master Plan Update
	MassDEP	Massachusetts Department of Environmental Protection
	MassDOT	Massachusetts Department of Transportation
	MassWildlife	Massachusetts Division of Fisheries and Wildlife
	MEPA	Massachusetts Environmental Policy Act
	MESA	Massachusetts Endangered Species Act
	MSGP	Multi-Sector General Permit
N	NAAQS	National Ambient Air Quality Standards
	NEPA	National Environmental Policy Act
	NHESP	Natural Heritage and Endangered Species Program
	NHPA	National Historic Preservation Act
	NLEB	Northern Long-eared Bat
	NPDES	National Pollution Discharge Elimination System
	NPIAS	National Plan of Integrated Airport Systems
	NRCS	Natural Resources Conservation Service
	NRHP	National Register of Historic Places
	NRI	Natural Resource Inventory
P	PAPI	Precision Approach Path Indicator
	PGP	Programmatic General Permit
	PM	Particulate Matter
R	RTN	Release Tracking Number
	RDC	Runway Design Code
	RMAT	Resilient Massachusetts Action Team
	RSA	Runway Safety Areas (or Revised Statutes Annotated)
	RPZ	Runway Protection Zone
	RCRA	Resource Conservation Recovery Act
	RVZ	Runway Visibility Zone
	RW	Runway
S	SDWA	Safe Drinking Water Act
	SF	Square Feet
	SHPO	State Historic Preservation Office
	SIP	State Implementation Plan
	SWPPP	Stormwater Pollution Prevention Plan
	SWQPA	Shoreline Water Quality Protection Act
T	TAF	Terminal Area Forecast
	TBD	To Be Determined
	TDG	Taxiway Design Group
	TERPS	Terminal Instrument Procedures
	THPO	Tribal Historic Preservation Office
	TMDL	Total Maximum Daily Loads
	TMPU	Technical Master Plan Update
	TSP	Total Suspended Particulates
	TW	Taxiway
U	USACE	US Army Corps of Engineers
	USC	US Code
	USDOT	US Department of Transportation
	USFWS	US Fish and Wildlife Service
	UST	Underground Storage Tank
V	VA-OIS	Visual Area-Obstacle Identification Surface
	VASI	Visual Approach Slope Indicator

1 Introduction

The Plymouth Airport Commission (PAC) and Plymouth Municipal Airport (Airport), in cooperation with the Massachusetts Department of Transportation (MassDOT) and Federal Aviation Administration (FAA) as the Lead Federal Agency, has prepared this Environmental Assessment (EA) to fulfill obligations under the National Environmental Policy Act of 1969 (NEPA; 42 USC §§ 4321 *et seq* as amended) and regulations issued by the Council on Environmental Quality (CEQ; 40 CFR Parts 1500-1508, 2021). It follows requirements for Environmental Assessments (EA) in the National Environmental Policy Act Implementing Instructions for Airport Actions (FAA Order 5050.4B April 28, 2006) and Environmental Impacts: Policies and Procedures (FAA Order 1050.1F, July 16, 2015).

Smaller Figures are included directly within the narrative chapters. Larger 11"x17" figures (maps) are separated into **Appendix A**. **Appendix B** includes References and source information.

1.1 NEPA and MEPA Review

1.1.1 National Environmental Policy Act – NEPA Overview

NEPA was created to ensure federal agencies consider the environmental impacts of their actions and decisions. Federal agencies are required to systematically assess the environmental impacts of their proposed actions and consider alternative ways of accomplishing their missions, which are less damaging to and protective of the environment. The Proposed Action requires an Environmental Assessment under NEPA. In addition to the requirements under FAA Order 5050.4B (2006) and Order 1050.1F (2015) identified above, a broad range of legislation and regulations.

The FAA is aware of the November 12, 2024, decision in *Marin Audubon Society v. Federal Aviation Administration*, No. 23-1067 (D.C. Cir. Nov. 12, 2024). To the extent that a court may conclude that the Council on Environmental Quality (CEQ) regulations implementing NEPA are not judicially enforceable or binding on this agency action, the FAA has elected to follow those regulations at 40 CFR parts 1500–1508, in addition to the FAA’s policies and procedures implementing NEPA at FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (July 16, 2015), to meet the agency’s obligations under NEPA, 42 U.S.C. §§ 4321 *et seq*.



FIGURE 1-1. NEPA Environmental Assessment Funnel

1.1.2 Massachusetts Environmental Policy Act – MEPA Overview

The MEPA process was initiated with the filing of an Environmental Notification Form (ENF), which was submitted to MEPA on April 18, 2023, and noticed in the Environmental Monitor on April 26, 2023. MEPA assigned the EEA number 16692 to the project. The Executive Office of Energy and Environmental Affairs issued a MEPA Certificate on the Draft EA/EIR on January 16, 2024, The MEPA Certificate

specified the scope of the analysis needed in the Final EIR to satisfy MEPA requirements. A Final EIR was submitted on October 31, 2024 and the comment period closed on December 9, 2024. A Certificate was issued on the Final EIR on December 16 with a conclusion that the Final EIR **adequately and properly** complies with MEPA and its implementing regulations. See Appendix B for the Final EIR and Certificate on the Final EIR.

1.2 Background and General Project Description

1.2.1 Airport Description

The Airport is located on approximately 758 acres in the towns of Plymouth and Carver (**Figure 1-2, Appendix A, USGS Locus Map**). The Airport has operated since 1934 and now supports multiple businesses including a restaurant in the terminal, flight schools, aircraft maintenance, aircraft sales, and corporate/charter flight operations. Portions of the Airport property are developed consistent with the purpose of a General Aviation (GA) or “Non-primary” airport. This means that the Airport is a public-use GA airport that does **NOT** operate as a commercial airport under FAA 14 CFR Part 139. Further, the Airport has no current intent of growing beyond its GA confines or becoming an FAA Part 139 commercial service airport. Developed areas consist of paved runways, taxiways, hangars, an administration building (terminal), several office buildings, and other ancillary buildings. The Airport website (www.pymairport.com) contains a substantial amount of information, including hours of operation (6:00 am to 10:00 pm ET), operation and traffic pattern details for pilots, noise abatement procedures, runway/taxiway information, on-Airport business list and links, and other useful information.

The Airport operates two runways. Runway 15-33 is 4,350 ft long (with 300’ long stopway) by 75 ft wide and is aligned in a northwest to southeast direction, and Runway 6-24 (primary runway) is 4,650 ft long (with 300’ long displaced threshold) by 75 ft wide and is aligned in a northeast to southwest direction. Runway 6-24 is served by Taxiway E, which is currently a full-length parallel taxiway (4,650 ft by 35 ft) located on the northwesterly side of the runway. Taxiway E provides access to existing hangars, administration building/terminal, and the fixed base operator’s (FBO) ramp. Runway 15-33 is served by Taxiway S, which is a full-length parallel taxiway (4,350 ft by 35 ft) located at the south side of the runway. Taxiway D is a 2,500 ft-long parallel taxiway that connects Taxiway K to Taxiway S and Runway 15-33. It provides access from hangars located on the south side of the Airport along the Gate 6 access road, including the Cape Cod Community College hangar.

Three of the four Airport approaches extend over the Town of Plymouth; however, approximately 250 acres, including the approach end of Runway 6, Gate 6 access, and associated access roadway lie in the Town of Carver. The Town of Plymouth has also incorporated the Airport Zone to protect the airspace surrounding the Airport. Existing developed land within the Airport Zone includes a mixture of commercial agriculture (cranberry bogs), office space associated with the Airport, residential development, and some industrial/commercial development along South Meadow Road.

The undeveloped areas on the Airport include wetlands, upland grasslands, scrub shrub areas around the wetlands, and forested habitats on the rear portions of the Airport beyond Runway 33 end and beyond the Gate 6 access road. Portions of South Meadow Pond and an unnamed pond, associated with a nearby cranberry bog, are located on the southern portion of the Airport. The Airport is also located

over an EPA-designated Sole Source Aquifer (SSA). State and local wetland resource areas located within and adjacent to the Airport include Bordering Vegetated Wetlands (BVW), Isolated Vegetated Wetlands (IVW) and/or Isolated Land Subject to Flooding (ILSF), and Bordering Land Subject to Flooding (BLSF)¹. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) (Panel No. 25023C0361K, 25023C0363K, and 25023C0364K effective July 6, 2021), portions of the Airport are located within Zone A.

Additionally, according to the NHESP Atlas (15th Edition), the Airport also contains a blanket overlay of approximately 352 acres of mapped *Estimated Habitat of Rare Wildlife* and/or *Priority Habitat of Rare Species* due to presence of state-listed grassland birds. Portions of this overlay map includes the entirety of the developed and impervious areas of the Airport, which are not grassland, but which are included within the NHESP mapped areas. Of this total, approximately 60 acres are managed pursuant to the Airport's NHESP-approved Grassland Management Plan for grassland bird species.

1.2.2 General Project Description

The proposed improvements under this EA include minimal runway and taxiway extensions, airfield navigational instrument relocation, two hangars, and airfield infrastructure (sewer line extension and backup generator; Table 1-1). This EA contemplates proposed improvements to the runway safety areas (RSAs) as well as other safety-related improvements that are intended to make the Airport safer. In addition, two hangars are added to the environmental assessment that are proposed to align with the Runway 6 project plans and supplement previously approved hangars that have not yet been built.

In 2022, the Airport created the Technical Master Plan Update (TMPU) and Airport Layout Plan (ALP). The FAA accepted the TMPU and approved the ALP on March 20, 2023. The TMPU evaluated aviation demand forecasts, facility requirements, airport access and geometry, and airside facility requirements over a 20-year planning horizon through 2042. The 2022 builds off of the earlier 2011 Master Plan that projected similar baseline information and improvements 2021. The 2022 TMPU contemplated, evaluated, and analyzed an updated and revised set of alternatives that now require an Environmental Assessment of these alternatives and their potential environmental impacts. The forecast prepared in the TMPU determined that the Airport will remain a General Aviation (GA) airport in the "B-II" category throughout the planning period. The "B" indicates the Aircraft Approach Category of 91 knots or more, but less than 121 knots. The "II" indicates that the Airplane Design Group has a wingspan of 49 feet or more but less than 79 feet. The tail height is 20 feet or more but less than 30 feet.

Within the TMPU, a series of runway length alternatives were developed to meet the current and future needs of the Airport. These alternatives are focused on the airport's primary deficiency, which is the current inability to serve the "critical aircraft," defined as "the most demanding aircraft (or family of aircraft) with at least 500 annual operations that operates, or is expected to operate, at the Airport." Within the TMPU, the alternatives were evaluated based on: 1) air safety, 2) ability to serve the critical aircraft, 3) impact on adjacent land use, 4) environmental considerations, and 5) financial impact. The fourth criterion evaluated whether the alternative has any negative environmental impacts as defined under NEPA. Environmental impacts were gauged on a scale from *No Impact* to *Significant Impact*.

¹ Wetland resource areas under the jurisdiction of The Wetlands Protection Act (Massachusetts General Laws [MGL] Chapter 131, Section 40) and 310 CMR 10.00: Wetlands Protection Act [WPA] Regulations.

Environmental impacts included multiple categories, such as wetlands, bogs, and drainage ditches/swales. Bordering Vegetated Wetlands (BVW) also include a 100' state-jurisdictional buffer zone under the Massachusetts Wetlands Protection Act (WPA; MGL 131 §40 and regulations at 301 CMR 10.00). Other environmental considerations included floodplains and groundwater resources (*e.g.*, aquifers), grassed turf areas, forested vegetation (tree obstructions), noise, and air quality.

The TMPU presented a 5-year “Capital Improvement Plan” (CIP) from 2023-2027 (Table 1-1). The current project proposed for 2025-2027 is to minimally extend the length of Runway 6-24, extend Taxiway A and Taxiway E to align with the new Runway 6-24 length, relocate navigational aids, and install a sewer main extension along a portion of the Gate 6 access road. The TMPU describes other work anticipated to occur in the short term, five-year CIP, which include water/wastewater sewer main upgrades, Gate 3 taxiway reconstruction, reconstruction of Runway 6-24, and emergency generator airside infrastructure (Table 1-1). Projects presented in the CIP and currently proposed are described and evaluated within this EA.

For projects after the 5-year CIP period, the FAA-approved Airport Layout Plan (ALP) identifies projects projected through 2042. In addition to the “No Build” alternative, the TMPU evaluated three additional alternatives for extending Runway 6 based on the needs of the critical aircraft (Dassault Falcon 2000) – 351', 550', and 850'. The unconstrained runway length calculation for the critical aircraft based on 60% useful load² is 5,500 feet, which would require a runway extension of 850'. Due to feasibility and environmental considerations, the 351' extension was selected as a preferred alternative by the Airport in the TMPU. The resulting runway length will be 5001'.

² “Useful load” is used in General Aviation only and refers to the weight of the pilot, crew, passengers, baggage, usable fuel, and drainable oil. (NOTE: Commercial operations refer to “payload”, which implies customers pay for their baggage to be transported.)

TABLE 1-1. 5-Year Capital Investment Program Projects and Funding Overview

Planning Period	Project	Estimated Project Cost	Estimated FAA Funding	Estimated MassDOT Match	Estimated Local Match
2023	Runway 6/24 & Taxiway E** Extension EA/EIR	\$350,000	\$315,000	\$17,500	\$17,500
2024	Design and Permit Runway 6 Extension / Taxiway E**	\$480,000	\$432,000	\$24,000	\$24,000
	Water / Wastewater Upgrades Sewer Main Construct <3,000 LF and associated appurtenances (Gate 6 Access Rd)	\$700,000	\$0	\$560,000	\$140,000
2025	Extend Runway 6/24 (351' x 75')	\$4,600,000	\$4,140,000	\$230,000	\$230,000
	Extend Taxiway E/A (700'x35')	\$3,000,000	\$2,700,000	\$150,000	\$150,000
	Gate 3 Taxilane Reconstruction Full depth pavement reconstruction (~50,000 sf) near porta-port hangars	\$525,000	\$472,500	\$26,250	\$26,250
2026	Reconstruction Runway 6/24 [partial depth]	\$5,700,000	\$5,130,000	\$285,000	\$285,000
	Emergency Generator Infrastructure	\$275,000	\$247,500	\$13,750	\$13,750
5-Year AICP Total		\$15,630,000	\$13,437,000	\$1,289,000	\$886,500
NOTES: *Source – 2022 Plymouth Municipal Airport Technical Master Plan Update, pg 67, Table 6-1. ** 2023 and 2024 \$\$ figures include Taxiway/lane A ***TMPU does not include or contemplate two additional hangars that are proposed under the NEPA EA/ MEPA EIR to be built in the vicinity of the taxilane apron at the Runway 6 end of Taxilane A.					

1.2.3 Economics and Forecast

The Airport is considered a regional General Aviation (GA) Airport under FAA definitions serving small aircraft and regional charter service. The Airport has no intent of growing beyond its current confines and does NOT desire to become an FAA Part 139 commercial service airport. It supports daily Air Taxi and Charter services, daily medivac, daily agricultural, daily law enforcement, daily flight training, and weekly Angel Flights in support of life-sustaining medical transfers. The “growth” that is referred to repeatedly in the MEPA Certificate could be interpreted that the Airport is trying to attract larger jets and commercial passenger operations. Rather, the Airport is seeking improvements to address the operational needs of the existing fleet.. As shown in **Tables 1-2, 1-3, and 1-4** below, the historic operations at the Airport (<2008) were impacted heavily by the 2008-2011 recession. More recently, the pandemic further exacerbated the aviation industry (circa 2020-2022), and the Airport experienced additional operational losses. The Proposed Action is intended to more safely accommodate the existing aircraft types and recover from the operational losses posed by the pandemic. Furthermore, future opportunities are anticipated to include compatible commercial businesses that could generate additional revenues to support the Airport and the surrounding region with jobs and economic opportunities.

Two state-produced documents are available that provide details on the economic benefits of airports to the regions wherein they exist. These are the earlier Massachusetts Statewide Airport System Plan Technical Report (2010 System Plan) and the latest Massachusetts Statewide Airport Economic Impact

Study Update (2019 Study Update), which goes into depth on the 39 public-use airports included in the study with specific details about the Plymouth Municipal Airport throughout the documents. Of the 30 GA airports featured in the 2019 update, Plymouth Municipal Airport ranked fourth behind Westfield-Barnes Regional Airport (Westfield/Springfield), Norwood Memorial Airport, and Lawrence Municipal Airport in terms of employment figures with “Total Employment” of 368 jobs (includes direct “on-airport” [213] and multiplier “off-airport” [155]). The Airport ranked fourth out of 30 in terms of total payroll after Westfield-Barnes and Norwood with over \$19 million in total payroll and nearly \$63 million in total output according to the study measures. This demonstrates that the Plymouth Municipal Airport provides a significant economic benefit to the region in the form of jobs and revenue generation.

The earlier 2010 System Plan divided all Massachusetts airports into four role categories – Commercial Service, Corporate/Business, Community/Business, and Essential/Business based on criteria and objectives under three categories – Airside Facilities, Landside Facilities, and Services. The study categorized Plymouth as one of ten “Corporate/Business” airports, as the Airport “serve(s) a primary role in regional economic activities, connecting to state and national economies.” The factor thresholds included a 4000’ *minimum primary runway length (or 40 Based Aircraft)*, but the *minimum facility objective* for Primary Runway Length is 5,000’ or greater. So the Airport fits within the *minimum* criteria for a Corporate/Business airport, but falls short of the *objective* for the primary runway length (and other criteria) stated within the 2010 System Plan.

Based on the purpose of safely serving the critical aircraft at a higher useful load (still less than 60% of total aircraft useful load available), the primary goal of extending Runway 6 by 351’ is to allow for the minimal extension alternative that facilitates a higher useful load than the current undersized runway. This is especially important under anticipated climate change impacts that will increase heat, thereby making longer runway areas necessary to avoid grounding or takeoff issues. The extension also allows for a second runway of this length so there are two runways to opt between in times of bad weather, heavy wind, emergency situations, and so forth. The inability for based and visiting critical aircraft to fuel to a higher volume/capacity impacts operators and pilots’ decisions to land and remain at the Airport versus choosing another airport to utilize, purchase fuel, and base their aircraft where runways are longer. In addition, the lack of suitable hangar space in contrast to the number of inquiries the Airport regularly receives indicates a need for the additional hangar spaces contemplated by the EA. This represents a potential loss to the Airport of both revenues and associated jobs and operational sustainability. **Table 1-2 and Table 1-3** below illustrate that in general, the trend in numbers of based aircraft has fallen from original and earlier forecasted numbers. The Airport is working with the FAA, MassDOT Division of Aeronautics, and other stakeholders to overcome the challenges, remain competitive, continue looking to near-term technologies that will overcome impending climate change effects, and sustain a viable asset to the Massachusetts statewide airport system.

Additional details on passenger numbers and aircraft operations are provided in **Table 1-2, Table 1-3, Table 1-4**, and Section 5.10 as related to Noise Analysis in response to the MEPA ENF Certificate. The TMPU provided additional details on Airport and aircraft operations (reference TMPU Chapter 3, Section 3.4).

TABLE 1-2. Historical Terminal Area Forecast Operations (Source: TMPU Table 3-4 based on FAA TAF)

YEAR	Local	Itinerant	Total
2000	26,500	40,000	66,500
2010	30,000	23,200	53,200
2020	30,000	21,000	51,000
2021	33,103	27,918	61,021

TABLE 1-3. Based Aircraft History and Forecast – 1990-2041

Aircraft Type	1990	1995	2000	2005	2007*	2009**	2027 Forecast*	2022 Tech MP Update***	August 2023 Actual ^{LL}	2041 Forecast***
Single Engine	[detail N/A]				102	103	113	79	77	65
Multi-Engine					13	22	13	10	14	9
Turboprop					5		9	7	N/A	8
Business Jet					9	11	29	5	6	8
Helicopter					13	8	22	4	8	5
Glider					0	0	0	0	0	0
Ultra-Light					0	1	4	0	0	0
Total	186*	189*	168*	168***L	142	105	190	105	105	98
	[220[†]]	[179[†]]	[179[†]]		[154[†]]		[167-207]			
NOTES:	<p>*Source: 2011 Plymouth Municipal Airport Master Plan (MP) The 2011 MP Figure 3-2: “Jet Operation Estimates by Based Aircraft” includes the note “Due to the 2008-2011 economic recession, the growth reflected in the near-term forecast does not reflect actual experience...”, which indicates that the number of based aircraft may have been negatively affected. Note differences between the 2011 MP, the current FAA TAF reporting system for the same report years, and 2022 TMPU for years 2005 and others. However, the trends are generally in the down direction.</p> <p>**Source: 2010 Massachusetts Statewide Airport System Plan</p> <p>***Source: 2022 TMPU utilizing 2021 data.</p> <p>[†]Source: 2022 TMPU and FAA Terminal Area Forecast (TAF) – https://taf.faa.gov Includes note “Impact of COVID-19 Pandemic on TAF Forecasts” [accessed most recently 8/7/23] “In the 2022 TAF the forecasts account for the downturn and recovery from the COVID-19 pandemic to varying degrees based on airport type. For a discussion of this see Forecast Process for 2022 TAF.”</p> <p>^{LL}Source: FAA National Based Aircraft Inventory Program – https://basedaircraft.com</p>									

TABLE 1-4. Forecasted PYM Annual Operations Summary by Aircraft Type
(Source: TMPU Table 3-12 and Table 3-14)

	YEAR							
TYPE	2021		2026		2031		2041	
	Local	Itinerant	Local	Itinerant	Local	Itinerant	Local	Itinerant
Single Engine	22,510	18,984	22,970	19,372	23,445	19,751	24,397	20,535
Multi Engine	2,979	2,513	3,034	2,558	3,058	2,590	3,150	2,685
Turbo-Prop	3,972	3,350	4,069	3,431	4,168	3,515	4,362	3,679
Turbo-Jet	2,317	1,954	2,370	1,998	2,458	2,073	2,630	2,217
Rotorcraft	1,324	1,117	1,379	1,163	1,432	1,207	1,539	1,295
TOTAL	61,021		62,344		63,696		66,489	
Net Change	-		1,323 (4/day more than 2021)		1,352 (4/day more than 2026)		2,793 (8/day more than 2031; total 16/day over 2021)	
% Change	-		0.98%		0.98%		0.96%	
NOTES:	“Local” refers to aircraft that take off and land from PYM; “Itinerant” refers to aircraft that either take off or land from other airports.							

1.3 Public and Agency Involvement

The Airport has a tradition of working side-by-side and engaging with the community that exceeds FAA participation guidelines (AC 150/5050-4A *Community Involvement in Airport Planning*). Throughout the process of developing the 2022 TMPU and this EA, the Airport actively conducted agency and public outreach for over a year that included the general public, Environmental Justice (EJ) community members, Tribal organizations, and other community stakeholders. The TMPU outlined the Guiding Principles for the effort, including Guiding Principal #1 “*Create a transparent track to encourage public involvement in the Master Planning process to ensure that airport Stakeholders have the opportunity to provide input on future development.*” The TMPU contained a *Draft Public Engagement Plan*, and this Final EA contains a *Final Public Engagement Plan (Appendix C)*.

This environmental assessment takes into account MEPA regulations and incorporates additional information to address subject areas that require further analysis than might otherwise be required under NEPA. Chapter 6, and several appendices identified throughout the narrative contain additional information on agencies involved, stakeholders contacted, and other outreach efforts, including details about each of the four public information meetings held from January 2022 through March 23, 2023. The public was also invited to participate in the MEPA Scoping Session on May 10, 2023, which was detailed in Section 1.1 above. Under FAA Order 5050.4B (April 2006), Section 704(a), “*If Tribal consultation is needed, the airport sponsor must contact the responsible FAA official to comply with FAA Order 1210.20, American Indian and Alaska Native Tribal Consultation Policy and Procedures, dated January 28, 2004.*” The regional FAA office is coordinating with federally recognized tribes to consult on any tribal concerns.

All of the materials reviewed and provided at the meetings have been posted on the Airport’s website under “*Environmental Assessment*,” “*Technical Master Plan Update*”, and/or “*Public Notices*” (current as of 8/1/23; see www.pymairport.com). As part of this Final EA effort, public information meetings were held in November 2023 and 2024.

In addition, substantial agency consultations have occurred throughout the TMPU process and continue to date. Consultations specific to the Final EA effort have included the Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program (NHESP) regarding the potential take of state-listed grassland bird habitat. There have been multiple remote and in-person meetings with NHESP to determine what mitigation options may be appropriate for any potential effects to the subject grassland bird species and habitats. In addition, NHESP provided a comment letter to MEPA outlining efforts to date and requesting continued consideration during the Draft EA/EIR and Final EA phases (refer to Section 5.5). The Airport project team has continued to coordinate with the NHESP.

The Massachusetts Historical Commission was consulted regarding any resources under 950 CMR 71.00 “*Protection of Properties Included in the State Register of Historic Places*” and consultation under Section 106, the National Historic Preservation Act of 1966. No comments were received from the MHC during the 30-day review period under CMR 950 71.04, and a written request was submitted for a “no effect” determination based on this collective information. The response communications are included in **Appendix D**. In addition, the FAA conducted outreach to the Tribal Historic Preservation Officers for federally recognized tribes. The letters were submitted on August 10, 2023, with no response as of the date of this Final EA (Appendix D).

The United States Fish and Wildlife Service (USFWS) was consulted via the agency’s online system “*Information for Planning and Consultation*” (IPaC) tool. The results of the consultation are included in Section 4.3.2.

2 Purpose and Need

The Purpose and Need Statement in a NEPA document is a formal statement of the need and the overall purpose of a proposed project considering the statutory objectives of the proposed Federal actions, as well as the Sponsor's goals and objectives (FAA Order 5050.4B). The statement documents the justification for the project and provides the basis for evaluating the effectiveness of alternatives. FAA Order 5050.4B indicates that the purpose and need should be one or two short paragraphs. This EA document separates the two to provide clarity regarding the multiple purposes that have evolved. The MEPA Certificate requires that the purpose and need **of each project proposed** in the TMPU should be identified. Table 2-1 further below includes that basic information.

The 2022 *Technical Master Plan Update (TMPU) and Airport Layout Plan (ALP)* identified a series of Airport Improvements under the 5-year Capital Improvement Plan (CIP). The TMPU focused primarily on the projects relevant to the Runway 6 extension and associated Taxiway E and Taxiway A extensions. The TMPU also included additional projects identified in Table 2-1. Based upon the TMPU, a number of different project alternatives were developed for the Runway 6-24 and taxiway layouts in order to address the current safety and compliance issues at hand. The process and progression of the evaluation of the alternatives and the alternatives that were selected for further study are detailed in Chapter 3 of this EA. These selected alternatives and individual projects in the 5-year CIP comprise what is referred to below as the ***"Proposed Action."***

2.1 Purpose

The purpose of the project is to meet the following objectives:

- Improve safety by providing, to the extent practicable, runway and taxiway lengths and runway safety area layouts that meet FAA standards for the design/critical aircraft.
- Accommodate current and forecasted aircraft operations during peak hours.

2.2 Need

The TMPU determined that the Airport was in need of various design improvements to bring it into compliance and to be able to accommodate the critical aircraft.

First, the Airport's primary Runway 6-24, does not fully support the critical aircraft at desired capacity (per TMPU Chapter 3). The existing length of Runway 6-24 is 4,650 feet (including 300' displaced threshold), whereas a runway length analysis determination in the TMPU and associated supporting documentation concluded that a minimum runway length of 5,500 feet was required to meet current aircraft operations. This length is based on 60% useful load and worst-case landing length requirements during *"contaminated"* runway conditions (*i.e.*, standing water, ice, snow, slush, frost in any form, heavy rubber, or other substances). The runway length determination was based upon the criteria in FAA AC 150/5325-4B. This minimum runway length is needed to meet the operational requirements of the existing design aircraft fleet, and to improve the safety of landing and takeoff operations. The Proposed Action is for less than the minimum for 60% useful load. Therefore, the critical aircraft would need to operate at a reduced capacity under the proposed conditions (351' extension rather than 850' extension).

Second, FAA Advisory Circular (AC) 150/5300-13B specifies full parallel taxiways along all runways with Instrument Landing Systems (ILS). Full parallel taxiways improve airport safety by allowing taxiing aircraft to steer clear of runways and thereby reduce the chances of conflicts between aircraft. The current need to extend the runway will result in a non-compliant Taxiway A and Taxiway E condition. Therefore, these two taxiways will need to be extended to meet the FAA requirements.

TABLE 2-1. Purpose and Need of Each Project in the CIP

Year	Project	Purpose & Need
2024	Runway 6/24 & Taxiway E/A Extension Environmental Assessment	NEPA & MEPA Review as precursor to RW 6/24 & TW E/A Extensions to improve safety by providing, to the extent practicable, runway and taxiway lengths and runway safety area layouts that meet FAA standards for the design/critical aircraft (AC 150/5300-13B, Airport Design AC 150/5325-4B, Runway Length Requirements)
2025	Design and Permit Runway 6 Extension/ Taxiway E/A	Meet FAA design requirements at AC 150/5300-13B, Airport Design AC 150/5325-4B, Runway Length Requirements
	Water / Wastewater Upgrades Sewer Main	Construction of <3,000 linear feet (lf) of gravity sewer main and associated appurtenances on the southwest side of Airport to upgrade substandard systems to meet applicable state design and capacity requirements to meet demand
2026	Extend Runway 6/24 (351' x 75')	Meet FAA design requirements at AC 150/5300-13B, Airport Design AC 150/5325-4B, Runway Length
	Extend Taxiway E/A (700'x35'/1000'x35')	
	Gate 3 Taxilane Reconstruction	Full depth pavement reconstruction (~50,000 sf) immediately adjacent to the porta-port hangars
2027	Reconstruction Runway 6/24	Partial depth pavement reconstruction within existing footprint / envelope of RW 6/24
	Emergency Generator Airside Infrastructure	Impervious pad <~100 SF (10'x10') to hold generator providing emergency backup to existing energy system.
[TBD]	Hangars – 2 x each approximately 100' x 100' (20,000 sq ft)	Meet existing demand for hangar space (located north of the Gate 6 Access Road and along Taxilane A)

3 Alternatives & Proposed Action

3.1 Introduction

Projects involving existing impervious surfaces can only occur in-kind, *e.g.*, Gate 3 taxilane and RW 6 rehabilitation. As shown in **Table 1-1** and **Table 2-1**, the wastewater treatment line and the two hangars proposed adjacent to Taxilane A are in conceptual phase (<30% design). The exact location and sizing, *etc.*, have been approximated, as those elements of the Proposed Action are beyond the scope of the TMPU and EA.

The location of each is within the footprint of the project area outline shown on **Figure 1-2** (red box). As for the Runway 6 reconstruction project, that will entail existing impervious areas, as will the Gate 3 taxilane reconstruction. **Table 2-1** above outlined the MEPA Thresholds and Purpose and Need for each of the projects considered in the Proposed Action. The Gate 3 Taxilane Reconstruction and Runway 6/24 Reconstruction are both considered “Routine Maintenance” and/or “Replacement” under MEPA definitions (301 CMR 11.02) and are not included in the full alternatives analysis, as no other location is feasible. The water/wastewater line will occur within the Project/Study Area shown in **Figure 1-2 (Appendix A)** along the existing footprint of the Gate 6 access road to reduce any new environmental impacts. The emergency generator is shown on **Figure 1-2** as a 10’x10’ area in a disturbed sand/gravel area immediately adjacent to the flight school near existing energy infrastructure. No other location is feasible for this installation. The impacts from that necessary equipment are considered *de minimus* and are not further analyzed.

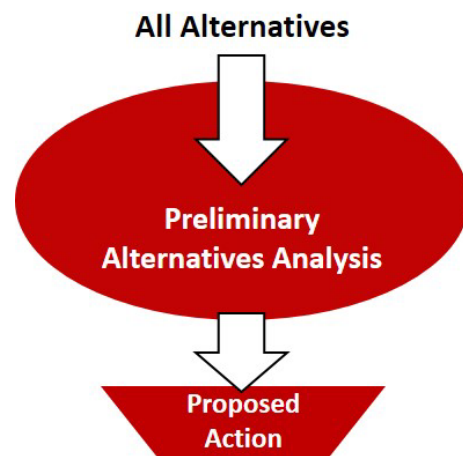


FIGURE 3-1. NEPA Step 1 – Alternatives Analysis

The Proposed Action relating to the remainder of the projects involves the extension of the RWY 6 approach end, southwestward by 351-ft for a total runway length of 5001-ft. The projects contains the following physical elements:

- Construct a 351-ft long, 75-ft wide extension on the approach to Runway 6 for a total runway length of 5001-ft;
- Construct a 351-ft long, 35-ft wide extension to the parallel taxiway (E) in order to serve the runway with a full-length parallel taxiway to meet the requirements of Parallel Taxiway Standards of AC/5300-13B in order to maintain less than mile visibility on Precision Approaches or Approaches with vertical guidance;
- Relocated medium intensity runway lighting (MIRL), Medium Intensity Approach Light System with Sequenced Flashing Lights (MALSF), Precision Approach Path Indicator (PAPI), and Runway 6 ILS glideslope.

3.2 Critical Design Elements

In order to address the Airport’s current and future needs, potential alternatives for future development

were considered in the TMPU. One of the challenges in creating the alternatives was finding an appropriate balance between FAA regulations and safety requirements, aircraft operational needs, and minimizing negative environmental and social impacts. While many design elements were incorporated to meet the Purpose and Need, runway length, runway safety area dimensions, object free areas, and approach surfaces determine the overall footprint of the project, which results in the various project impacts. Other references included FAA 14 CFR, Part 77, Safe, Efficient Use, and Preservation of Navigable Airspace; Order 5200.8 Runway Safety Area Program; FAA Advisory Circular (AC) 150/5070-6B, Airport Master Plans; AC 150/5300-13B, Airport Design; FAA Standard Operating Procedure (SOP) 2.00; Standard Procedure for FAA Review and Approval of Airport Layout Plans (ALPs); and AC 150/5325-4B, Runway Length Requirements for Airport Design.

The previous designation included an Airport Reference Code (ARC) of B-II based on operations and aircraft activity. Design criteria are determined in part by the “critical aircraft”, which is the type of aircraft with the fastest Airport Approach Category (AAC) and largest wingspan or Aircraft Design Group (ADG) that operate at the Airport at least 500 times per year. The higher the AAC and the larger the ADG, the larger the facility (such as a Runway Safety Area; RSA) required to accommodate the aircraft. The current recommended design aircraft for the Airport is proposed to be the Dassault Falcon 2000 based on the highest number of operations and other factors (TMPU 2022). The recommended ARC therefore remains at B-II.

3.3 Evaluation Process

To evaluate the potential build alternatives and identify the ultimate “**Proposed Action**”, the FAA and Airport performed a two-step evaluation process. Alternatives considered in this EA were developed and evaluated as part of the *TMPU and ALP Update (2022)* development. A detailed analysis therein resulted in a recommended length for Runway 6-24 of 5500’ to accommodate the critical aircraft at 60% of its useful capacity. Thereafter, a total of four Runway 6-24 alternatives were evaluated in this EA (including the “No Action”). All of the alternatives developed and evaluated are briefly described below.

- **TMPU/ALP:** This initial screening level resulted from the analysis presented within the *TMPU/ALP* wherein alternatives were evaluated using the following criteria and thereafter were either “Recommended” or not. The baseline “environmental costs” were briefly addressed.

As outlined in the *TMPU* Chapter 5, the evaluation criteria were comprised of:

- Air Safety
- Ability to Serve the Critical Aircraft
- Impact on Adjacent Land [includes consideration of EJ Communities]
- Environmental Impacts
- Financial Impact

Those alternatives proposed to resolve each improvement area must be compatible with the dimensional requirements for the current and future critical aircraft, both of which are modeled as the Dassault Falcon 2000. As determined in the *TMPU*, alternatives would have to maintain the existing runway lengths to be compatible with current and future critical aircraft. This is a typically a “fatal flaw” step of the evaluation; alternatives that would not provide the needed primary Runway 6-24 length and width based on average stage length for 60% useful load and other factors presented for critical aircraft would not “pass” the evaluation and would not advance. In other words, they would not be “Recommended” in a *TMPU* and brought to a “Proposed Action” stage in an EA. However, because of the need to balance the Airport’s needs with considerations of surrounding communities and potential environmental affects, the Recommended Alternative in the *TMPU* preliminarily differs from the Proposed Action.

- **EA Evaluation:** Alternatives that passed initial screening in the *TMPU* were retained for detailed analysis in the EA. Within the EA, additional screening occurs where impacts are analyzed and multiple mitigation strategies are presented. Chapter 5 presents several alternatives to mitigation and screening based on factors that include cost, operational impacts, and environmental impacts.

The four alternatives considered are summarized in **Table 3-1** below. Those in *italics* with blue highlight are the **Preferred Alternative** for each improvement action and were carried forward for evaluation in the EA. They are illustrated in **Figure 1-2** and **Figure 3-2**. Together, those preferred alternatives are considered the “**Proposed Action**”. Alternatives that would not achieve the purpose and need and/or would not be feasible were not considered in the analysis of alternatives. As required by NEPA, the No Action Alternative is also studied in the EA, although the no action will not meet the purpose and need.

TABLE 3-1. Summary of Alternatives Evaluated in *Technical Master Plan Update (2023)*

ACTION	ALT 1 No Action/ Existing Condition	ALT 2 Preferred Alternative	ALT 3	ALT 4
Runway 6 Approach Length	Do Nothing [Non-Compliant w/FAA design requirements]	351' x 75' [Total RW length = 5001'*; meets RSA; does not meet 60% useful load]	550' x 75' [Total RW length = 5200**; does not meet 60% useful load]	850' x 75' [Total RW length = 5500'*; meets 60% useful load]
Taxiway A	Do Nothing	1000' x 35' [351' + 649' stub*]	1199' x 35' [550' + 649' stub*]	1499' x 35' [850' + 649' stub*]
Taxiway E	Do Nothing	700' x 35' [351' + 349' stub*]	899' x 35' [550' + 349' stub*]	1199' x 35' [850' + 349' stub*]
NAVAIDS:				
MIRL**	Do Nothing	Relocate	Relocate	Relocate
MALSF**	Do Nothing	Relocate	Relocate	Relocate
PAPI**	Do Nothing	Relocate	Relocate	Relocate
Glideslope	Do Nothing	Relocate [remove old access; create new access]	Relocate [remove old access; create new access]	Relocate [remove old access; create new access]
Fence	Do Nothing	Do not relocate***	Likely to relocate	Likely to relocate
Driveway	Do Nothing	Do not relocate***	Likely to relocate	Likely to relocate
Obstructions (Tree Removal)	Do Nothing	0	1-group current; 5-groups in near future	8-groups current; additional in future
Property Acquisitions/Easements	Do Nothing	None/0	3	4
NOTES: *Even though the 850' extension is the only option that accommodates the critical aircraft at 60% load capacity, the 351' extension was presented as the Preferred Alternative in the TMPU based on all factors that include public engagement and environmental concerns. This EA presents the 351' as the "Proposed Action" for RW 6 Approach based on ultimate Airport Commission determination that resulted from those same factors with additional cost, stakeholder outreach, and future growth considerations considered; total lengths given for TW A and E include total length of asphalt to include the extension to meet RW 6 extension length + stub/turn section.				
**MIRL – Medium Intensity Approach Light System; MALSF – Medium Intensity Light System w/Sequenced Flashing Lights; PAPI – Precision Approach Path Indicator				
***The FAA is responsible for conducting an analysis of the glideslope location in conjunction with a proposed extension of RW 6 approach end. Based on the outcome of this analysis, they will determine if the fence (and driveway) would need to be relocated to avoid interference with the glideslope equipment and accuracy.				

3.4 Evaluation Results

3.4.1 Alternatives Considered

The following summaries present proposed improvements in **Table 3-1** above, as well as describe additional projects under the Proposed Action required to bring the navigational aids and RSA into compliance. The Preferred Alternative for each project area is shown below in ***bold italics***.

Runway Alternatives

The runway design standards are based on the Runway Design Code (RDC) for aircraft design group B-II for both the current critical aircraft and projected future critical aircraft.

- Runway 6 Approach:
Runway 6-24 is 4,650 ft long and 75 ft wide, which includes 4,350 foot runway and 300 foot displaced threshold at the RW 24 approach end. The runway length analysis presented in the *TMPU* determined that a minimum length of 5,500 ft would be needed to reach the minimums for 60% useful load for the critical aircraft.
There are four alternatives evaluated under this action:
1) No Action/Do Nothing, **2) 351 ft extension**, 3) 550 ft extension, 4) 850 ft extension

Taxiway Alternatives

The taxiway design standards are based on ADG II and Taxiway Design Group TDG-2. The following actions with alternatives for each were considered.

- Taxiway A Length
Taxiway A parallels Runway 6-24 and connects stub Taxiway K and the southern development area to the approach end of Runway 6. The preferred configuration following an extension of the Runway 6 approach is a full-length parallel taxiway that connects with the new end of the approach.
1) No Action/Do Nothing, **2) Extend with Runway 6 approach 351-ft extension (plus 649-ft stub connection totaling 1000 ft)**, 3) Extend with Runway 6 approach 550-ft extension (plus 649-ft stub connection totaling 1200 ft), 4) Extend with Runway 6 approach 850-ft extension (plus 649-ft stub connection totaling 1500 ft). If Taxiway A is extended, the new segment will need to maintain a 240-ft separation from the runway centerline. This will determine the length of the stub connector at the end of Runway 6 approach.
- Taxiway E
Taxiway is located between the Terminal Apron and Runway 6-24 and provides access to the runway from the terminal apron via four stub taxiways and the end of the Runway 6 approach end. The taxiway is 4,650 ft by 35 ft and parallels the length of Runway 6-24. As noted in the *TMPU*, the northerly end of the Taxiway has a 200-ft separation from the runway centerline. However, at the southwestern-most portion of Taxiway meets the FAA-required separation distance of 240 ft. If Taxiway E is extended, the new segment will need to maintain the 240-ft separation. This will determine the length of the stub connector at the end of Runway 6 approach.
1) No Action/Do Nothing, **2) Extend with Runway 6 approach 351-ft extension (plus 349-ft stub connection totaling 700 ft)**, 3) Extend with Runway 6 approach 550-ft extension (plus 349-ft stub connection totaling 899 ft), 4) Extend with Runway 6 approach 850-ft extension (plus 349-ft stub connection totaling 1199 ft)

Navigational Aids and Obstructions

The navigational aids, fence, access road, and obstruction considerations presented in **Table 3-1** above are carried forward in the EA analysis for all evaluated alternatives.

- Navigational Aids –
 - Medium Intensity Runway Lighting (MIRL) – The MIRL lights are located along all edges of Runway 6. Note that the Future Condition is to exchange the MIRL system for the HIRL system on Runway 6-24 (see ALP).
 - Medium Intensity Approach Light System (MALSF) – The MALSF lights are located prior to the approach to Runway 6. Depending on if and to what extent the Runway 6 approach is extended, the MALSF system will be shifted further from the end of the approach in a southerly direction.
 - Precision Approach Path Indicator (PAPI) – The PAPI system is situated between Taxiway E and the Runway approach end just southerly of stub Taxiway H. Depending on if and to what extent the Runway 6 approach is extended, the PAPI system will be shifted further in a southerly direction. The PAPI is proposed to be **relocated** to support the new position of the landing thresholds and are considered within the relevant alternatives.
 - Glideslope – The glideslope is part of the Instrument Landing System (ILS) Localizer identified on the ALP between Taxiway A and the Runway 6 approach end. Before a runway and taxiway extensions becomes feasible along Runway 6-24, the glideslope must be moved from its current location. Therefore, both Alt 1) No Action/Do Nothing and Alt 2) **Relocation** options were evaluated.
- Obstruction/Vegetation Removal – Results of the airspace analysis identified on-airport and off-airport obstructions to the RW 6 approach surface under the existing and proposed conditions. Alternative 2 (351') resulted in no obstructions/trees requiring removal. A single mature tree was deemed to be below the resulting approach surface (**Figure 3-2**). The Alternative 3 (550') and Alternative 4 (850') extensions would result in additional obstructions to those that already exist. In order to extend RW 6 under Alternatives 3 and 4, off-airport obstruction removal must occur to comply with all relevant clearance and safety regulations. On-airport and off-airport obstruction removal projects utilizing federal funding are subject to review within an EA. Prior to acquiring rights to manage off-airport vegetation, either by purchase of land in fee-simple or by purchase of an avigation easement, the EA must be completed and a FONSI issued.

3.4.2 Alternatives Eliminated

Two of the four alternatives shown in **Table 3-1** for the Runway 6 extension were eliminated from further analysis. In accordance with Order 1050.1F, §6-2.1(d), this section briefly describes why each of these alternatives was eliminated from further consideration.

Alt 3) 550-ft extension – Based on the alternatives analysis presented in the *TMPU*, this was the initially Recommended Alternative, even though it still would not meet the 60% useful load for the critical aircraft. However, the Airport determined that the higher cost and potentially higher environmental and adjacent community impacts outweighed the benefits derived. The Opinion of Probable Cost for engineering and construction of Alternative 3 presented in the *TMPU* is \$9,300,000, which is primarily due to a higher construction cost (Alt 2 OPC for construction is \$5,600,000; total is \$7,600,000. The design cost is estimated at \$100,000 more than Alt 2.)

Alt 4) 850-ft extension – This alternative is the only one of the three that results in meeting the 60%

useful load for the critical aircraft under the runway length analysis conducted and presented in the *TMPU*. Alternative 4 was eliminated by the Airport because the alternative would require extending the safety area and NavAids into a geographically-constrained area beyond the Runway 6 end, which would increase the high construction cost, potential environmental impacts, and resulting potential affects to neighboring community. The Airport determined that the high cost (including all new runway lights) and impacts outweigh the benefit of extending the runway to this extent. Alternative 4 was not considered to be “reasonable” or “feasible”. Therefore, the *TMPU* did not evaluate the total probable cost of Alternative 4.

3.4.3 Alternatives Retained

Two alternatives were retained for a detailed analysis in the EA: 1) No Action Alternative; and 2) Preferred Alternative as highlighted in **Table 3-2**.

Alternative 1 – No Action Alternative (aka “No Build”, “No Project”, or “Do Nothing”)

Alternative 1 – No Action – No physical or operational changes would be implemented, and this would not resolve the minimum runway length needs.

As presented in the *TMPU* (Chapter 5), the total amount of asphalt along RW 6-24 would remain at 4,650-ft and the Airport would continue to operate as it currently does with the ability to serve the critical aircraft at a substantially reduced capacity.

Alternative 2 – Preferred Alternatives & “Proposed Action”

- Runway 6 – Extend 351 ft
- Taxiway A Length – Extend 351 ft with 349-ft stub
- Taxiway E – Extend 351 ft with 649-ft stub
- NavAids (MIRL, MALSF, PAPI, Glideslope) – Relocate

This retained alternative proposes a 351-ft extension to the RW 6 approach end, southwesterly for a total runway length of 5001 ft. Based on the runway length analysis, this does not meet the 60% useful load for the critical aircraft. However, it does increase the runway length to allow for safer approach and takeoff distances.

TABLE 3-2. Summary of Alternatives Retention Results

ACTION	Alternative	EVALUATION RESULTS	
		Retained/ Not Retained	Reason for Result
ALL ACTIONS	1) No Action	Retained for Detailed Analysis	NEPA requires evaluation of environmental consequences for No Action alternative
Runway 6 Approach			
	Alt 2 – 351'	Retained for detailed analysis	Passes all screening criteria
	Alt 3 – 550'	Not retained	Eliminated from EA evaluation based on public outreach and potential impacts
	Alt 4 – 850'	Not retained	The only alternative that would reach the 60% critical aircraft threshold, but eliminated from EA evaluation based on potential public and environmental impacts
Taxiway A Length			
	Alt 2 – 351' +stub	Retained for detailed analysis	Passes all screening criteria
	Alt 3 – 550' +stub	Not retained	Eliminated based on elimination of RW 6 Alt 3
	Alt 4 – 850' +stub	Not retained	Eliminated based on elimination of RW 6 Alt 4
Taxiway E Length			
	Alt 2 – 351' +stub	Retained for detailed analysis	Passes all screening criteria
	Alt 3 – 550' +stub	Not retained	Eliminated based on elimination of RW 6 Alt 3
	Alt 4 – 850' +stub	Not retained	Eliminated based on elimination of RW 6 Alt 4
NAVAIDS			
MIRL, MALSF, PAPI			
	Alt 2 – 351'	Retained for detailed analysis	Passes all screening criteria
	Alt 3 – 550'	Not retained	Eliminated based on elimination of RW 6 Alt 3
	Alt 4 – 850'	Not retained	Eliminated based on elimination of RW 6 Alt 4
Fence & Access Road			
	Alt 2 – 351'	Retained for detailed analysis	Passes all screening criteria
	Alt 3 – 550'	Not retained	Eliminated based on elimination of RW 6 Alt 3
	Alt 4 – 850'	Not retained	Eliminated based on elimination of RW 6 Alt 4
Glideslope			
	Alt 2 – 351'	Retained for detailed analysis	Passes all screening criteria
	Alt 3 – 550'	Not retained	Eliminated based on elimination of RW 6 Alt 3
	Alt 4 – 850'	Not retained	Eliminated based on elimination of RW 6 Alt 4
Obstruction Removal			
	Alt 2 – 351'	Retained for detailed analysis	Passes all screening criteria
	Alt 3 – 550'	Not retained	Eliminated based on elimination of RW 6 Alt 3
	Alt 4 – 850'	Not retained	Eliminated based on elimination of RW 6 Alt 4

3.5 Conclusion of Evaluation Process

The CEQ NEPA regulations at 40 CFR 1502.14 require that an EA examine “*all reasonable alternatives to a proposed project*”. If an alternative is not reasonable, it is eliminated from detailed study. The CEQ has defined the term “reasonable alternatives” to include “*those that are practical or feasible from a technical and economic standpoint...*”.

Numerous alternatives were investigated and analyzed within the *TMPU* (2023). The screening analysis concludes that only one alternative for each project component is practical and feasible relative to meeting the project need, detailed in Chapter 2. This EA evaluates the “No Action” and “Proposed Action” under 14 primary NEPA Categories (FAA Order 1050.1F). Details regarding the retained “Preferred Alternative” for each project is explained within Section 3.6 below.

The Preferred Alternative and resulting Proposed Action in **Table 3-2** was determined to be the only feasible scenario that would meet the purpose and needs of the Airport when public engagement, economic factors, and preliminary environmental concerns versus forecast conditions and long-term goals were considered. This alternative was recommended for more detailed study. It was determined that additional design work would be necessary during the EA process to further evaluate the impacts, particularly for those involving stormwater management.

3.6 Proposed Action

As presented in the screening section above, each of the Preferred Alternatives examined during the *TMPU* (2022) process evaluated the following.

- Air Safety – meets current FAA standards in accordance with AC 150-5300-13B
- Ability to Serve the Critical Aircraft – meets the current and projected needs of the facility based on the forecasted airport operations (currently the Dassault Falcon 2000)
- Impact on Adjacent Land – considered potential effects on neighboring communities
- Environmental Impacts – provided preliminary consideration for the environmental resources to be further evaluated under NEPA
- Financial Impact – evaluated the costs associated with the alternative with a standard 20% contingency. [Note that the “Estimated Project Cost” is based on the *TMPU*’s Table 6-1; see **Table 3-3 below**].

The “Proposed Action” is comprised of the recommended projects in **Table 3-2**, along with those presented earlier in **Table 1-1** and **2-1** and summarized in the bullets immediately below.

- Design and Permit Runway 6 Extension/ Taxiway E
- Water / Wastewater Upgrades Sewer Main
- Extend Runway 6/24 (351’ x 75’)
- Extend Taxiway E/A (700’x35’)
- Gate 3 Taxilane Reconstruction
- Reconstruction Runway 6/24
- Emergency Generator Airside Infrastructure
- Hangars – 2 x each approximately 100’ x 100’ (20,000 sq ft)

Table 3-3 summarizes the Key Cost Features of the Preferred Alternatives (not including the cost of preparing the NEPA EA). The potential resource impacts are detailed in Chapter 5 – Environmental Consequences.

TABLE 3-3. Key Cost Considerations of Retained/Preferred Alternatives

		Key Features
ACTION	RETAINED ALTERNATIVES	Estimated Cost*
Runway 6		
	Alt 1 – No Action/Do Nothing	\$0
	Alt 2 – Extend 351’ [= 26,325 SF of asphalt]	\$480,000 – Design & Permitting (includes TW A/TW E) \$4,600,000 – RW 6 Extension Construction
Taxiway A		
	Alt 1 – No Action/Do Nothing	\$0
	Alt 2 - Extend 351’ + 649’ stub [= 35,000 SF of asphalt]	[Design & Permitting included under RW 6 above] \$3,000,000 (includes TW E)
Taxiway E		
	Alt 1 – No Action/Do Nothing	\$0
	Alt 2 - Extend 351’ + 349’ stub [=24,500 SF of asphalt]	[Design & Permitting included under RW 6 above] [Construction included in TW A above]
Nav aids (MIRL, MALSF, PAPI, Glideslope)		
	Alt 1 – No Action/Do Nothing	\$0
	Alt 2 - Relocate	\$1,100,000
*Source: Plymouth Municipal Airport, Technical Master Plan Update (Section 7.5), August 2022.		

3.7 Timeline and Phasing of Proposed Action

The timeline of the CIP projects from the TMPU was presented in **Table 1-1** and **Table 2-1**. **Table 3-4** presents an overview of the anticipated timeframe required to implement the projects under the Proposed Action between 2025 through 2027. Each of the alternatives are proposed within a four-year construction phasing in order to address financing and reduce disruption to Airport operations and pilots using the airfield.

Table 3-4 General Timeline of Proposed Action Based on TMPU Proposed 5-Year CIP

Year	Project	Notes
2024 - 2025	Complete NEPA / MEPA Review	
2025	<ul style="list-style-type: none"> Design and Permit RW 6/24 Extension, TW E, TW A Install Water/Wastewater Upgrades; Sewer Main 	Pending NEPA FONSI and MEPA approval
2026	<ul style="list-style-type: none"> Extend RW 6/24, TW E, TW A Gate 3 Taxiway Reconstruction 	Will include navaid relocations
2027+	Emergency Generator Airside Infrastructure	Tying into existing infrastructure

4 Affected Environment

This section is often referred to as “*Existing Conditions*”, those that are currently present as of the submission of this EA document to the determining federal and state agencies. Per FAA Order 1050.1F outlining the agency’s NEPA requirements (specifically Paragraph 6-2.1[e]), this section describes the environmental conditions of the geographic area at the Airport potentially affected by the Proposed Action.

The resource categories are presented in the order given in FAA Order 1050.1F, Exhibit 4-1. The data and analyses are presented in the level of detail associated with the importance of the impact; lower impact areas are described in brief summaries, while higher impact areas are described in more detail. Where applicable, the description provides references to information or analysis that is reasonably available to the public. This section describes other relevant activities (past, present, and reasonably foreseeable future actions), their interrelationships, and cumulative associations. The discussion includes only those environmental impact categories affected by the Proposed Action (or any reasonable alternatives to demonstrate the likely impacts). For resources that do not occur in the vicinity and could not be affected by the Proposed Action, a general description is provided and the resource is dismissed from further consideration (per Order 1050.1F, Para 4-2.c).

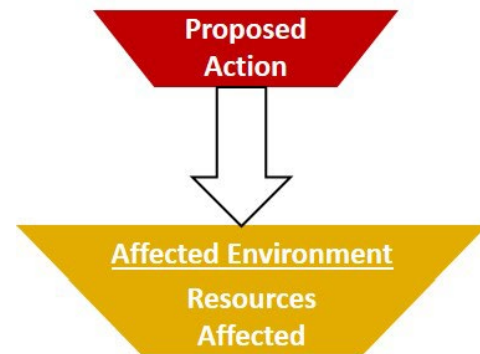


FIGURE 4-1. NEPA Step 2 – Resources Affected Determination

4.1 Study Area

The “*Study Area*” for each of the resource categories varies according to area of potential impact. The projects related to the Runway 6 extension project proposed for 2023 through 2025 will occur within the study area shown in **Figure 1-2** (*Locus*) and **Figure 4-2** (*Existing Conditions*). The water/wastewater upgrades to the sewer main are likewise contained within the red study area box in those figures to be aligned with the Gate 6 access road up to the vicinity of the flight school at the northerly end of Taxiway A. The Gate 3 taxiway reconstruction proposed for 2025 is shown in **Figure 1-2** in a previously disturbed impervious area near South Meadow Road and the T-hangars. The Runway 6/24 partial depth reconstruction project in 2026 is contained within the disturbed and impervious footprint of the existing Runway 6/24. That project is only proposing to remove and replace the top layer(s) of the pavement, but not the entire depth. The relevant study areas are described within each resource area described below. **Figure 4-3** illustrates the *Environmental Constraints* (referred to under NEPA as “resources affected”) in the RW 6 extension area.

4.2 Resources Not Affected

4.2.1 Coastal Resources

Federal activities involving coastal resources are governed by the Coastal Barriers Resources Act (CBRA), the Coastal Zone Management Act (CZMA). The Airport is not located within any a Coastal Zone Management (CZM) area. Per Title 15 CFR 930.35 and FAA Order 5050.4B(706[e]), it is acceptable to state that the No Action, Proposed Action, would not affect coastal resources. Therefore, this resource is dismissed from further consideration.

4.2.2 Section 4(f) and Section 6(f) Resources

Areas protected under Section 4(f), 49 U.S.C. § 303,3 and Section 6(f) of the Land and Water Conservation Fund Act (16 U.S.C. §§ 460l-8(f)(3)) must be included in the NEPA evaluation. Both programs and regulations affect recreational and open space lands, so the review and approval by federal and state agencies under both regulations typically runs concurrently. **Figure 4-4** illustrates protected public open space in the vicinity of the Airport (Source: MassMapper).

Section 4(f) of the US Department of Transportation (DOT) Act of 1966 (49 USC § 303) protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. There are no Section 4(f) properties immediately adjacent to the project areas within the Airport. Section 6(f) of the Act provides matching funds to states or municipalities for planning, improvements, or acquisition of outdoor recreational lands. Any property that was planned, purchased, or improved with LWCF money is considered a 6(f) property.

The Proposed Action does not involve impacts on land regulated under Section 4(f) or Section 6(f). **Therefore, this resource is dismissed from further consideration.**

4.2.3 Farmlands

The Farmland Protection Policy Act (FPPA; 7 U.S.C. 4201-4209; PL 97-98 amended by section 1255 of the Food Security Act of 1985, PL 99-198) addresses the conversion of farmland to non-agricultural uses. The FPPA rules do not apply to land already committed to “urban development or water storage” regardless of its importance as defined by the NRCS. The Airport property is zoned Industrial and dedicated to and actively used for aviation activities. Therefore, these soils are exempt from the FPPA. There are no Prime Farmlands or Farmland of Local Importance at the Airport. **Therefore, the No Action and Proposed Action would not affect farmlands in the primary study area and this resource is dismissed from further consideration.**

4.2.4 Historical, Architectural, Archeological, and Cultural Resources

Under the National Historic Preservation Act of 1966 (NHPA), a historic property is “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior” as stated in 36 CFR Part 800. NHPA Section 106 requires federal agencies to consider the effects of their actions on such historic properties, including any projects involving state or federal permitting, funding, or approval. The ENF was submitted on April 18, 2023, and public notice was released in the Environmental Monitor on April 26, 2023. The FAA conducted federal THPO consultation to request review from the Wampanoag Tribe of Gay Head (Aquinnah) and the Mashpee Wampanoag Tribe (Appendix D).

No comments were received from the MHC during the 30-day review period under CMR 950 71.04, and a written request was submitted for a “no effect” determination based on this collective information. The response communications are included in **Appendix D**. After review of the relevant information, the FAA is issuing a finding of “No Historic Properties Affected” in accordance with Section 106 for this undertaking. Therefore, this resource is dismissed from further consideration.

4.2.5 Visual Effects and Light Emissions

The FAA is required to consider the potential for lighting associated with a proposed development action that may become an annoyance to people in the vicinity or interfere with their normal activities. Due to the minimal changes in the light emissions proposed with the alternatives, adverse effects to the surrounding land uses are not anticipated. Therefore, this resource is dismissed from further consideration.

4.2.6 National Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 (PL 90-542; 16 US Code 1271) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. There are no designated Wild and Scenic Rivers located on or near the Airport. Therefore, this resource is dismissed from further consideration.

4.2.7 Water Resources: Floodplains and Floodways

Floodplains are the lowland or flat areas that are adjacent to coastal or inland waters, including areas prone to flooding during a 100-year flood as defined by the Federal Emergency Management Agency (FEMA). These floodplain areas are protected from encroachment to preserve and restore the natural and beneficial values that floodplains provide. FEMA Flood Insurance Rate Maps (FIRMs) for the vicinity of Plymouth Municipal Airport were most recently updated in 2021 (FIRM panels 25023C0361K, 25023C0362K, 25023C0363K, and 25023C0364K, effective 7/2021), they provide a baseline using the latest science (**Figure 4-6 and Figure 4-7; Appendix A**). T Stormwater design for the project is proposed to occur outside of the floodplain and in accordance with all FAA design standards to meet or exceed requirements, including Low Impact Design (LID) and green infrastructure, where appropriate and within cost and other constraints. Therefore, this resource is dismissed from further consideration.

4.3 Resources Affected

4.3.1 Air Quality

The study area for air quality is the entire geographic area that could be either directly or indirectly affected by the Proposed Action. The Clean Air Act Amendments of 1990 (104 Stat. 2468, P.L. 101-549) requires the US Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The EPA Office of Air Quality Planning and Standards has set NAAQS for six principal "criteria pollutants". These pollutants include ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), lead (Pb), particulate matter (PM_{2.5} and PM₁₀) and sulfur dioxide (SO₂). The EPA regulates these pollutants through human health-based (primary standards) and environmental-based (secondary standards) criteria. Table 4-1 lists the current NAAQS. In Massachusetts, the state air quality standards are the same as the NAAQS.

TABLE 4-1. National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Period	NAAQS (µg/m ³)	
		Primary	Secondary
NO ₂	Annual ⁽¹⁾	100	Same
	1-hour ⁽²⁾	188	None
SO ₂	3-hour ⁽³⁾	None	1300
	1-hour ⁽⁴⁾	196	None
PM _{2.5}	Annual ⁽¹⁾	12	15
	24-hour ⁽⁵⁾	35	Same
PM ₁₀	24-hour ⁽³⁾	150	Same
	8-hour ⁽³⁾	10,000	Same
CO	1-hour ⁽³⁾	40,000	Same
	8-hour ⁽⁶⁾	147	Same
Pb	3-month ⁽¹⁾	0.15	Same

Source: <http://www.epa.gov/ttn/naaqs/criteria.html> and 310 CMR 6.04

⁽¹⁾ Not to be exceeded.

⁽²⁾ 98th percentile of one-hour daily maximum concentrations, averaged over three years.

- (3) Not to be exceeded more than once per year.
(4) 99th percentile of one-hour daily maximum concentrations, averaged over three years.
(5) 98th percentile, averaged over three years.
(6) Annual fourth-highest daily maximum eight-hour concentration, averaged over three years.

According to the FAA 1050.1F Desk Reference, version 3 (October 2023), Section 1.1, the USEPA has designated areas with poor air quality that have concentrations of criteria pollutants above the NAAQS as “nonattainment areas.” Areas with measured outdoor air concentrations below the NAAQS are considered “attainment” areas. The EPA makes final determinations (called designations) as to whether states meet the NAAQS. As of the most recent EPA Green Book report (<https://www.epa.gov/green-book>; updated July 31, 2023) the counties within the Airport Service Area (ASA), which consists of Plymouth, Norfolk, Bristol, and Barnstable, are considered in attainment for all criteria pollutants.

Since the air quality in the immediate region of the Airport is *in attainment*, and project-related impacts to air quality will be limited to temporary construction impacts that will be mitigated to the extent feasible, only a qualitative analysis is included to describe the current air quality in the region as described below.

4.3.1.1. Background Air Quality

To estimate background pollutant levels representative of the area, the most recent US EPA design values³ were obtained for 2020 to 2022 for the criteria pollutants. The closest and most representative monitoring station for which data are available for all air pollutants is generally selected. The monitoring station at Harrison Avenue in Boston was selected for this project. This station is located in an urban area near major roads and therefore considered a conservative estimate of background air concentrations. Table 4-2 presents the background air quality concentrations for all the criteria air pollutants.

TABLE 4-2. Background Air Pollutant Concentrations

Pollutant	Averaging Time	Background Concentration (µg/m³)	NAAQS	Percent of NAAQS
NO ₂ ⁽¹⁾	1-Hour	83	188	44%
	Annual	18.8	100	19%
SO ₂ ⁽²⁾	1-Hour	5.2	196	3%
PM _{2.5}	24-Hour ⁽³⁾	14	35	40%
	Annual ⁽³⁾	5.9	12	49%
PM ₁₀	Max 24-hr	28	150	19%
CO ⁽⁴⁾	1-Hour	1840	40000	5%
	8-Hour	1840	10000	18%
Ozone ⁽⁵⁾	8-Hour	121.7	147.0	83%
Pb	Max 24-hr	0.003	0.15	2%
Notes: From Air Quality Design Values US EPA , or EPA's AirData Website (1) NO ₂ concentrations are reported in ppb. Converted to µg/m³ using factor of 1 ppb = 1.88 µg/m³.				

³ [Air Quality Design Values | US EPA](#). A design value is reported by US EPA in the correct format for comparison with the NAAQS

- (2) SO₂ reported ppb. Converted to µg/m³ using factor of 1 ppb = 2.62 µg/m³.
- (3) Background level is the average concentration of the three years.
- (4) CO is reported in ppm. 1 ppm = 1150 µg/m³.
- (5) O₃ reported in ppm. Converted to µg/m³ using factor of 1 ppm = 1963 µg/m³.

As shown in **Table 4-2** the background air quality is generally very good even in urban areas with high traffic volumes, with air concentrations that are well below the current NAAQS. The airport project will not result in additional emissions from any changes in operation that would result in an exceedance of the NAAQS.

4.3.2 Biological Resources (Fish, Wildlife, and Plants)

Biologic resources refer to the various types of vegetation and wildlife (invertebrates, fish, birds, reptiles, amphibians, and mammals). This includes terrestrial and aquatic plant and animal species; game and non-game species; special status species (state- or federally-listed threatened or endangered species, marine mammals, or species of concern, such as species proposed for listing or migratory birds); and environmentally sensitive or critical habitats. The relevant resources and habitats are shown on **Figure 4-13 (Appendix A)**. The FAA 1050.1F Desk Reference breaks the categories into *Federally-Protected Species* (and federally identified Critical Habitats), *State-Protected Species*, and *Migratory Birds*. In addition, a section has been added to describe *State-Designated Significant Habitat*.

4.3.2.1 Federally-Protected Species

The consideration of endangered and threatened species is required under multiple regulations for actions that would directly or in some cases, indirectly impact listed species or affect critical habitats. These include the Endangered Species Act as amended (16 USC §§ 1531 – 1544; 50 CFR Part 17), the Fish and Wildlife Coordination Act (16 USC §§ 661-667d; 50 CFR Part 402), the Migratory Bird Treaty Act (50 CFR part 22), and the Bald and Golden Eagle Protection Act (50 CFR Part 22).

According to the United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) database most recently consulted on October 23, 2023, there are three listed species on or immediately adjacent to the Airport property, and 11 migratory birds that may visit or travel through the area of the Airport property or its vicinity. The formal IPaC-generated Species List (**Appendix H**) identifies three listed species that may be on or immediately adjacent to the Airport property:

- Northern Long-Eared Bat (*Myotis septentrionalis*) – Federally Endangered
- Plymouth Redbelly Turtle (*Pseudemys rubriventris bangsi*) – Federally Endangered
 - [Note that the USFWS Ecos profile illustrates a broad range map for this species that does encompass the Airport and a regional polygon that includes unsuitable habitat types, but the federally-identified critical habitat for this turtle species is mapped to the east of the property, in a watershed complex associated with Great Pond, over 1.5 miles east of the end of Runway 33.]
- Monarch Butterfly (*Danaus plexippus*) - Candidate species

4.3.2.2 State-Protected Species

The Airport's grassland habitats support four state-listed grassland-nesting avian species. These species and their habitats are protected pursuant to the Massachusetts Endangered Species Act (MESA; MGL Chapter 131A) and its implementing regulations (321 CMR 10.00). The Airport is within the regulatory Priority Habitat of Rare Species (PH591). Prior to filing the MEPA ENF on April 18, 2023, ongoing consultation with the Massachusetts Division of Fisheries and Wildlife (MassWildlife) Natural Heritage and

Endangered Species Program (NHESP) was initiated for compliance with MESA (**Appendix E**). The Airport has been coordinating with the NHESP for many years on projects at the Airport under previous MEPA and NEPA filings.

Approximately 352 acres of the Airport property is mapped by NHESP as Estimated Habitat, Priority Habitat or both. Of this total, approximately 60 acres are actively managed for state-listed bird species pursuant to the Airport's NHESP-approved Grassland Management Plan. Portions of the Plymouth Airport are currently managed to maintain habitat for state-listed species in accordance with the provisions of the current Conservation and Management Permit (CMP) for state-listed grassland bird species that will be updated as part of the Proposed Action efforts (see MESA CMP # 005-049.DFW, # 014-240.DFW, and # 018-329).

Grasshopper Sparrow (Massachusetts Status: Threatened)

Grasshopper sparrows (*Ammodramus savannarum*) forage, breed, and sleep on the ground in grassland, upland meadow, pasture, hayfield, and old field habitats. Nesting grasshopper sparrows may occur on agricultural lands and airports where such habitats occur. Although grasshopper sparrows may use small grasslands, open areas of over 100 acres are favored. Optimal habitat for these sparrows contains short- to medium-height bunch grasses interspersed with patches of bare ground, a shallow litter layer, scattered forbs, and few shrubs. Grasshopper sparrow habitat on the Airport is generally restricted to the Cultural Grassland areas, as shown in **Figure 4-13**. The Airport manages a portion of the cultural grassland habitat as a long-term grassland habitat management area in accordance with the Grassland Habitat Management Plan (2018) and various NHESP Permits and Permit Amendments. Grassland Habitat is managed north and south of Runway 6 end and within the infield of Runway 6-24 and Taxiway D, these areas are delineated in **Figure 4-13**.

Vesper Sparrow (Massachusetts Status: Threatened)

Vesper sparrows (*Pooecetes gramineus*) typically inhabit sparsely vegetated areas with patches of bare ground, low vegetation (one to eight inches), and scattered shrubs and saplings. Inhabitants of open areas, vesper sparrows reside in cultivated fields, grasslands, fallow fields, and pastures. Habitats are typically dry and well drained. Nests are placed within clumps of herbaceous cover that afford protection from predators. Suitable vesper sparrow habitat includes those areas mapped as Cultural Grassland and identified on **Figure 4-13** and within the Grassland Habitat Management Plan (2018).

Upland Sandpiper (Massachusetts Status: Endangered)

Native grasslands are the preferred habitat of the upland sandpipers (*Bartramia longicauda*). They typically feed in short grass areas, where they are found in migration and during winter. They typically arrive at the Airport in mid-April to early May to breed. During the breeding season, upland sandpipers often perch on fence posts or utility poles. They forage by walking quickly through the grass with jerky movements, picking up items from the ground or from low vegetation. Suitable upland sandpiper habitat includes the areas mapped as Cultural Grassland on **Figure 4-13** and within the Grassland Habitat Management Plan (2018).

Eastern Meadowlark (Massachusetts Status: Special Concern)

Suitable habitat for the Eastern Meadowlark (*Sturnella magna*) in Massachusetts includes grasslands, pastures, and hayfields. They prefer moderately tall grasslands with abundant litter cover, and moderate to high forb density. Breeding presence is directly correlated to unfragmented patch size. They prefer grasslands of at least ten acres and are reported as requiring greater than 100 acres of contiguously suitable habitat to support a breeding population with multiple pairs. Suitable habitat for this state-listed Species of Special Concern overlaps with the areas mapped for the other three species above and shown in **Figure 4-13**.

4.3.2.3 Migratory Birds

The 11 migratory birds that may visit or travel through the area of the Airport property or its vicinity are as follows:

- Bald Eagle (*Haliaeetus leucocephalus*)
- Black-billed Cuckoo (*Coccyzus erythrophthalmus*)
- Blue-winged Warbler (*Vermivora pinus*)
- Eastern Whip-poor-will (*Antrostomus vociferous*)
- Hudsonian Godwit (*Limosa haemastica*)
- Lesser Yellowlegs (*Tringa flavipes*)
- Prairie Warbler (*Dendroica discolor*)
- Ruddy Turnstone (*Arenaria interpres morinella*)
- Rusty Blackbird (*Euphagus carolinus*)
- Willet (*Tringa semipalmata*)
- Wood Thrush (*Hylocichla mustelina*)

All of these birds, except for the Bald Eagle, are on the USFWS list of Birds of Conservation Concern (BCC). The Bald Eagle is considered “Vulnerable” under the Bald and Golden Eagle Protection Act. There may be other species that are not currently known or expected to occur on or immediately adjacent to the Airport property, but are covered by the Endangered Species Act (ESA) wherever they are found.

4.3.2.4 Significant Habitat (State-designated)

Within MESA (MGL c 131A⁴, Section 1 Definitions), “*Significant Habitats*” are “*specific areas of the commonwealth, designated in accordance with section four, in which are found the physical or biological features important to the conservation of a threatened or endangered species population and which may require special management considerations or protection. Priority and Estimated Habitat maps are used for determining whether or not a proposed project must be reviewed by the NHESP for MESA and WPA compliance.*”

“*Priority Habitat*” is based on the known geographical extent of habitat for all state-listed rare species, both plants and animals. Habitat alteration within Priority Habitats may result in a take of a state-listed species, and is subject to regulatory review by the NHESP. “*Estimated Habitats*” are a sub-set of the Priority Habitats, and are based on the geographical extent of habitat of state-listed rare wetlands wildlife and the classification is codified under the WPA (MGL 131 §40), which does not protect plants. State-listed wetland wildlife species are protected under MESA as well as the WPA. **Figure 4-13** shows Priority Habitat and Estimated Habitats for rare species. Much of the Airport property, including the current extents of all runways, is included within designated Priority Habitat for rare species. Mass Mapper identifies three (3) NHESP Certified Vernal Pools to the south of Runway 33, approximately 600 feet, 700 feet and 1,350 feet from the end of Runway 33. Such seasonal pools of water may provide habitat for distinctive plants and animals.

4.3.3 Climate, Climate Change, and GHG

The Airport is located within a “subtropical highland” according to the Koppen climate classification (Cfb subset of oceanic climate featuring cool summers and winters). According to the National Weather Service (NWS NOWData, October 2021 and February 2022; source: PYM ASOS), summer temperatures on occasion reach the upper 90 degrees Fahrenheit (F) temperature range, but the highest average daily

⁴ MESA statute - <https://malegislature.gov/Laws/GeneralLaws/PartI/TitleXIX/Chapter131A>

high temperature typically reached in July and is 82.1 degrees F. The lowest average low temperature of 20.3 degrees F occurs in January. Precipitation is evenly distributed throughout the year with historic averages of 48 inches per year.

This environmental assessment is concerned with the topic of Climate Change and those statutes that pertain to clean air, emissions, and GHGs. The Clean Air Act (discussed under Section 4.3.1, Air Quality) at 42 USC §§ 7408, 7521, 7571, 7661 *et seq* and 40 CFR parts 85, 86, and 600 for surface vehicles and 40 CFR part 60 for stationary power generation sources, regulates GHG emissions from on-road surface transportation vehicles and stationary power generation sources.

The primary concern related to airports is the influence of operations on climate change that revolves around Greenhouse Gases (GHG) and their influence on climate, temperature regimes, and resulting effects.

Forecasted operations were identified in **Table 1-3** and **Table 1-4**, and show that based aircraft are far fewer than they were in past years. Though the goal is to recover from losses experienced in the 2008-2011 recession and 2020-2022 pandemic and retain based aircraft, the increase is very slight over the next 20 years with no significant increases in the GHGs within the Airport Service Area (ASA). As noted under 4.3.1, the ASA consists of Plymouth, Norfolk, Bristol, and Barnstable counties.

4.3.4 Hazardous Materials, Solid Waste, and Pollution Prevention

Multiple applicable federal regulations control the use, storage, handling, and disposal of solid waste and hazardous materials (*e.g.*, Comprehensive Environmental Response, Compensation, and Liability Act, CERCLA; Resource Conservation and Recovery Act, RCRA; Toxic Substances Control Act, TSCA).

Airport actions that relate only to airfield development (runways, taxiways, and related improvements) will not normally include any direct relationship to solid waste collection, control, or disposal other than that associated with the construction itself. General aviation (GA) airports are not typically large generators of solid waste. Airport buildings include hangars for storage and maintenance of aircraft, office space and public terminal buildings.

The Airport currently uses a variety of hazardous or potentially toxic materials, such as vehicle and aviation fuels and solvents, which could be released to the environment in the event of a spill, aircraft crash, or ground support equipment accident. The Airport has a Spill Prevention Control and Countermeasures (“SPCC”) Plan that establishes procedures for handling these substances. Aircraft fuel storage and refueling areas are limited to the apron areas on the northern side of the Airport near South Meadow Road. Hazardous materials used for operation and maintenance of aircraft, runways, and taxiways include fuels, degreasers, and aviation lubricants and oils. No hazardous material is anticipated with the Proposed Action and construction.

To determine the potential for encountering soils contaminated from historical releases or former land development practices during excavation and grading activities associated with the runway and taxiway extensions, the MassDEP reportable release database⁵ was reviewed for spills at sites located within 300 feet of the proposed Project. There were no releases reported within 300 feet of any of the proposed projects. There is one closed disposal site, regulated under MGL c 21E, and the Massachusetts Contingency Plan [MCP – 310 CMR 40.0000] located on the property and upgradient of the Runway 6 project area (**Appendix I**). The historic release (RTN 4-0026005) was due to a plane crash in February 2016 that resulted in the sudden release of approximately 25 gallons of aviation fuel. The release impacted surficial soils, but

⁵ ([https://eeaonline.eea.state.ma.us/portal#!/search/wastesite/results?](https://eeaonline.eea.state.ma.us/portal#!/search/wastesite/results?TownName=PLYMOUTH&SiteName=PLYMOUTH%20MUNICIPAL%20AIRPORT)

TownName=PLYMOUTH&SiteName=PLYMOUTH%20MUNICIPAL%20AIRPORT; accessed repeatedly, most recently 8/10/23)

groundwater and surface water impacts were not observed. The impacted soil was removed, and the site achieved a Permanent Solution with no Conditions under the MCP. Additional measures relating to the control and handling of materials under this category will be discussed and evaluated in Chapter 5 – Environmental Consequences.

4.3.5 Land Use

As identified in FAA Order 1050.1F, FAA actions may affect land use compatibility in a variety of manners – disruption of communities, relocation, induced socioeconomic impacts, land uses protected under Section 4(f) of the US DOT Act, *etc.* Those categories are each described in other sections of this Chapter as directed in Order 1050.1F. In most cases, the concept of *compatibility* is linked directly to noise. Noise is defined generally as “unwanted sound” and is treated in more detail in Section 4.3.7 - Noise. In this section, the concept of *compatibility* is described in a broad context to take into consideration the landscape within which the Airport operates as a basis of understanding for the other categories.

The Airport is located on the western border of the Town of Plymouth, and approximately 500 acres of the Airport’s 758 acres are located within the Town of Plymouth. Three of the four Airport approaches extend over the Town of Plymouth. Each of these three approaches has an associated Instrument Approach. Approximately 250 acres of the Airport are within the Town of Carver. The precision instrument approach to Runway 6 extends southwest over portions of the Town of Carver.

4.3.5.1 Existing Zoning

As the Plymouth Municipal Airport comprises land in both the Town of Plymouth and the Town of Carver, both have incorporated airport zoning language into their zoning ordinances (**Figure 4-14**). In accordance with the Town of Plymouth Zoning Map adopted in 2012 and the latest Zoning Ordinance from 2022, the Airport property and several surrounding properties are within the AP-Airport Zoning District. The Town of Plymouth incorporated the Airport Zone to protect the airspace surrounding the Airport, which was created to:

- 1) Provide for a wide range of by-right and light-intensity Industrial and Commercial Uses of a non-polluting nature, and to allow by Special Permit more intensive Industrial Uses;
- 2) Provide for future expansion of the existing airport facility to serve community needs; and
- 3) Encourage Uses that support or are compatible with airport operation.

The Town of Carver has an Airport District as well, where 250 acres of the 750 total acres of Airport property are located, plus surrounding agricultural uses and forested areas. Carver has also issued height restrictions on buildings in all zoning districts to prevent erection of structures that would cause hazardous obstructions to air navigation.

Areas immediately surrounding both of these communities’ Airport districts are in rural zones.

Plymouth residential land uses adjacent to the Airport are zoned either Rural Residential (RR) or Residential Medium Lot (R-25).

Parcels of land within Town of Carver in the approach to Runway 6 primarily include land zoned as Residential/ Agriculture (RA); however, the southwestern portion of the Approach Surface includes land zoned General Business (GB).

4.3.5.2 Existing Land Use

Developed land surrounding the Airport includes areas adjacent to South Meadow Road and areas along Federal Furnace Road to the east (**Figure 1-2 and Figure 4-2**). Land uses within the AP District include a mix of commercial, light industrial residential and agricultural uses, as well as recreation open space use (approximately one-half of the Village Links Golf Club). Existing developed land within the Town of

Plymouth located to the north and east of Airport property includes cranberry bogs, office space associated with the Airport, residential development, and industrial and commercial development along South Meadow Road. South Shore Early Education is adjacent to the Airport property on South Meadow Road. Also, Federal Furnace Elementary School (Pre-Kindergarten to 5th grades) is located near the Airport approximately 0.9 miles southeast of the Runway 33 threshold (**Figure 4-15**). Carver Middle School (located approximately one mile southwest of the Airport) as well as Carver High School (located approximately 1.5 miles southwest of the Airport) are both on South Meadow Road and are within the approach to Runway 6. The Church of Jesus Christ of Latter Day Saints constructed a temple on Federal Furnace Road in 2017, approximately 0.4 miles to the south of the Runway 33 threshold.

4.3.5.3 Planned and Future Land Use

FAA Order 1050.1F indicates that the affected environment for land use should include *Existing* land uses within the study area and *Planned and Future* land uses within the study area. All of the proposed improvement projects are located on existing Airport property and are consistent with existing aviation uses. Additional development in the immediate vicinity of the Airport and Airport approaches could increase the level of non-compatible land uses. However, by establishing the Airport zoning districts, the Towns of Plymouth and Carver have reduced the likelihood of the development of additional incompatible land uses along either runway approach.

4.3.6 Natural Resources and Energy Supply

As described in the FAA 1050.1F Desk Reference (February 2020), this category addresses the project's consumption of natural resources, including water, asphalt, aggregate, wood, along with use of energy supplies (such as coal, natural gas, and fuel for aircraft, keeping in mind the applicability to the Proposed Action). The existing condition is used as the baseline reference for any additions requiring sourcing additional natural resources for future Airport improvements. Section 5.9 addresses the use of materials for runway and taxiway additions that require base materials (*e.g.*, gravel/stone, sand, rocks, asphalt, fill). There will also be typical energy use for the construction projects, including stand-alone power (generators, trucks/ vehicles, equipment, *etc.*).

4.3.7 Noise and Noise-Compatible Land Use

Under Section 4.3.5 *Land Use*, noise was introduced as one of the contributing factors to determining if surrounding land use is compatible with Airport operations. By planning and developing compatible surrounding land uses, potential conflicts with non-compatible uses can be avoided. Over the years since the Airport was originally built in 1934, the surrounding communities have built up to include non-compatible land uses. The Airport strives to acknowledge and facilitate ongoing efforts to offset the noise impacts from Airport operations.

As part of previous Master Plan efforts, a noise analysis was completed in 2007 based on the Master Plan at that time for a forecast that estimated changes through 2027 (**Appendix J**). No part of the DNL 65 dB contour for Runway 6-24 extended onto any land uses identified as non-compatible per FAA guidance. An updated 2023 noise analysis based on the TMPU forecast was completed for the Proposed Action and is presented in Chapter 5 – Environmental Consequences, specifically Section 5.10 (**Appendix K**, 2023 Contour Map). The Airport has had noise abatement procedures in place for many years and reminds pilots continuously of the requisite procedures (**Appendix L**).⁶

⁶ Links to the Airport (PYM) Noise Abatement pages posted online: https://pymairport.com/noise_abatement; https://o.b5z.net/i/u/10130906/f/PYM_Noise_Abatment_Procedures.pdf; https://pymairport.com/aircraft_arrival_noise_abatement; https://pymairport.com/corporate_noise_abatement; https://pymairport.com/ga_noise_abatement; https://pymairport.com/helicopter_noise_abatement

4.3.8 Socioeconomics, Environmental Justice, and Children’s Health & Safety Risks; Public Health

FAA Order 1050.1F indicates, “For socioeconomics, the study area may be larger than the study area for other impact categories, as a proposed action could have an effect on the social fabric of the surrounding community. The environmental review should consider the impacts of the alternatives on the following broad indicators: economic activity, employment, income, population, housing, public services, and social conditions.” Therefore, a broader region that includes all of Plymouth, Carver, and an area approximately one to five miles from the Airport is included in this evaluation.

As they pertain to Socioeconomic Impacts, Environmental Justice (EJ), and Children’s Environmental Health and Safety Risks under NEPA, the following goals are among those included in the National Plan of Integrated Airport Systems (NPIAS 2021-2025, September 2020). These are factored into the Plymouth Municipal Airport (PYM) operations (as appropriate, keeping in mind that it is a smaller General Aviation (GA) airport and not a larger Part 139 commercial airport):

- Airports should be safe and efficient, located where people will use them, and developed and maintained to appropriate [FAA] standards.
- Airports should be affordable to both users and the Government, relying primarily on producing self-sustaining revenue and placing minimal burden on the general revenues of the local, State, and Federal Governments.
- Airports should be compatible with surrounding communities, maintaining a balance between the needs of aviation, the environment, and the requirements of residents.
- The airport system should be extensive, providing as many people as possible with convenient access to air transportation.

[Note that PYM is part of a much larger *system*, but has a valuable role to fulfill.]

- Effects on the human environment are classified under social impacts, and encompass a wide range of activities. The principal social impacts considered with any proposed airport actions include relocation of residences and businesses, alteration of surface transportation patterns, disruption of established communities or planned developments, and significant changes in employment.

In order to determine if and how EJ communities can best be integrated into the review process and outcomes, an understanding of the socioeconomic indicators and data needs is presented in addition to Environmental Justice details and Public Health considerations.

4.3.8.1 Socioeconomics

Airport development must take into account the socioeconomics and human environment surrounding the facilities, including the population density, demographics and living conditions. This section discusses the existing population, racial composition and general economic conditions in the vicinity of the Airport.

4.3.8.2 Economic Activity and Income

As discussed in the TMPU, there are three primary measurements of income: median household income, median family income and per capita income. With the exception of Bristol County, the income of individuals in the ASA is well above the national average according to the 2020 Census Estimates of Population and Housing. According to Census 2020 data (through 2019; **Table 4-3**), the median household income for the United States was \$62,843 while for the Commonwealth of Massachusetts the median household income was \$81,215 and for Plymouth County, the median household income was \$89,489. A majority of this increase in per capita and median household income has come about since

1980. The median household income in the ASA has increased from \$17,917 in 1980 to \$52,119 in 2000 and to \$84,052 in 2020, which is similar for Plymouth County. Per capita income is defined as the total personal income in a geographic region divided by the total population in the region, regardless of age or employment status. In the ASA, per capita income increased from \$7,372 in 1980 to \$31,093 in 2005 which yields an annual rate of growth of approximately 6%, and to \$44,388 in 2020 with a rate of 2.85% in the past 15 years. Within Plymouth County, the increase in per capita income between 1980 and 2005 mirrors that of the ASA. In 1980, Plymouth County's per capita income totaled approximately \$6,978. Plymouth County again mirrors the ASA with a per capita income in 2019 of \$43,412. **Table 4-4** includes updated measures of income acquired during the 2020 population Census.

TABLE 4-3. Measures of Income for Plymouth County, Airport Service Area, and Massachusetts
[Source: T MPU Table 2-13. Numbers in this table were from 2019 vs Table 4-4 below with updated Census figures from 2020.]

Table 2-13: Measures of Income for Plymouth County, Airport Service Area, and Commonwealth of Massachusetts 1980-2018						
Year	Plymouth County		ASA		Massachusetts	
	Median HH	Per Capita	Median HH	Per Capita	Median HH	Per Capita
1980	\$18,749	\$6,978	\$17,917	\$7,372	17,575\$	\$10,103
1990	\$40,905	\$16,523	\$37,602	\$16,967	\$36,952	\$17,224
2000	\$55,615	\$24,789	\$52,119	\$25,892	\$50,502	\$25,952
2010	\$72,076	\$37,637	\$64,782	\$35,120	\$62,072	\$35,547
2019	\$89,489	\$43,412	\$84,052	\$44,388	\$81,215	\$43,761

TABLE 4-4. Updated Measures of Income

	Town of Carver	Town of Plymouth	Plymouth County
Median Household Income	\$61,811	\$97,956	\$98,190
Per Capita Income	\$36,257	\$52,711	\$48,785
Source: US Census Bureau, https://www.census.gov/data.html and https://www.census.gov/quickfacts/ (acc 8/11/23) Population Census, April 1, 2020.			

4.3.8.3 Employment

Historically since 2010, the ASA and Plymouth County have had unemployment rates that roughly mirror state and national trends. Unemployment and labor force are inversely related. The unemployment rate in the ASA, Massachusetts and the United States was the highest in 2010 and steadily fell for the next decade, while the labor force was the lowest in 2010 and steadily grew over the same period (**Figure 4-16**). COVID19 created an anomaly of high unemployment and low labor force beginning in April 2020, both of which are slowly dropping and rising respectively, though neither back to their ultimate lows/highs of late 2019. The overall labor force has increased in the ASA from approximately 1,039,268 in 2010 to 1,117,817 in 2019 which equates to an 0.84% annual rate of growth, dropping by - 0.92% to 1,097,179 in 2021. Total employed persons increased from 931,880 in 2010 to 1,058,545 in 2019 which equates to an annual growth rate of 1.51%.

Within Plymouth County, the labor force, employment and unemployment rates are consistent with regional trends (**Figure 4-17**). Since 2010, the labor force in Plymouth County was lowest in 2010, with approximately 265,158 persons, and increased to a maximum of 289,635 persons in 2019, which amounts to a 1.66% annual growth rate (to account for seasonal fluctuations, highs and lows analyzed are within the same season). The number of employed persons in Plymouth County has increased at a

similar annual growth rate, from 240,867 in 2010 to 277,711 in 2019. Plymouth Airport directly employs nine people, for the public 7 days a week from 6am-10pm EST. Positions held are Airport Manager, Assistant Manager, Office manager, and six airport operations/ maintenance personnel. The airport's many businesses provide jobs for approximately 250 people.

FIGURE 4-16. Unemployment chart from the TMPU (Figure 2-11).

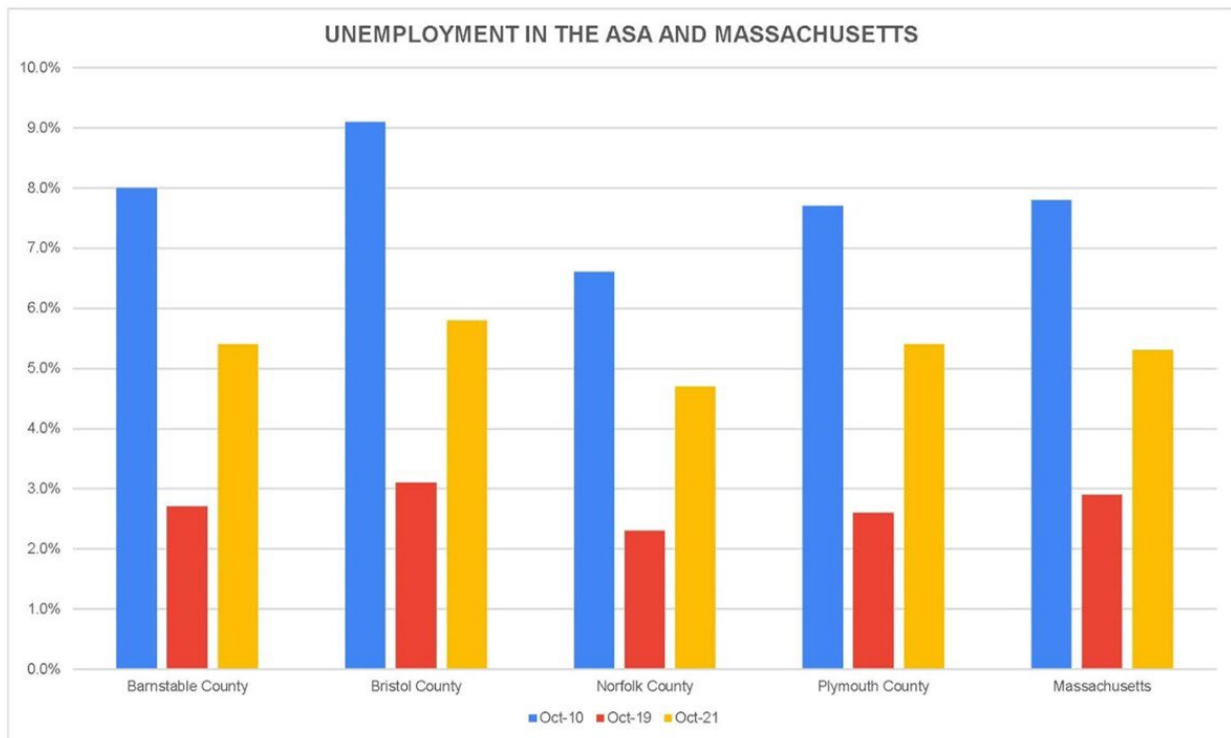
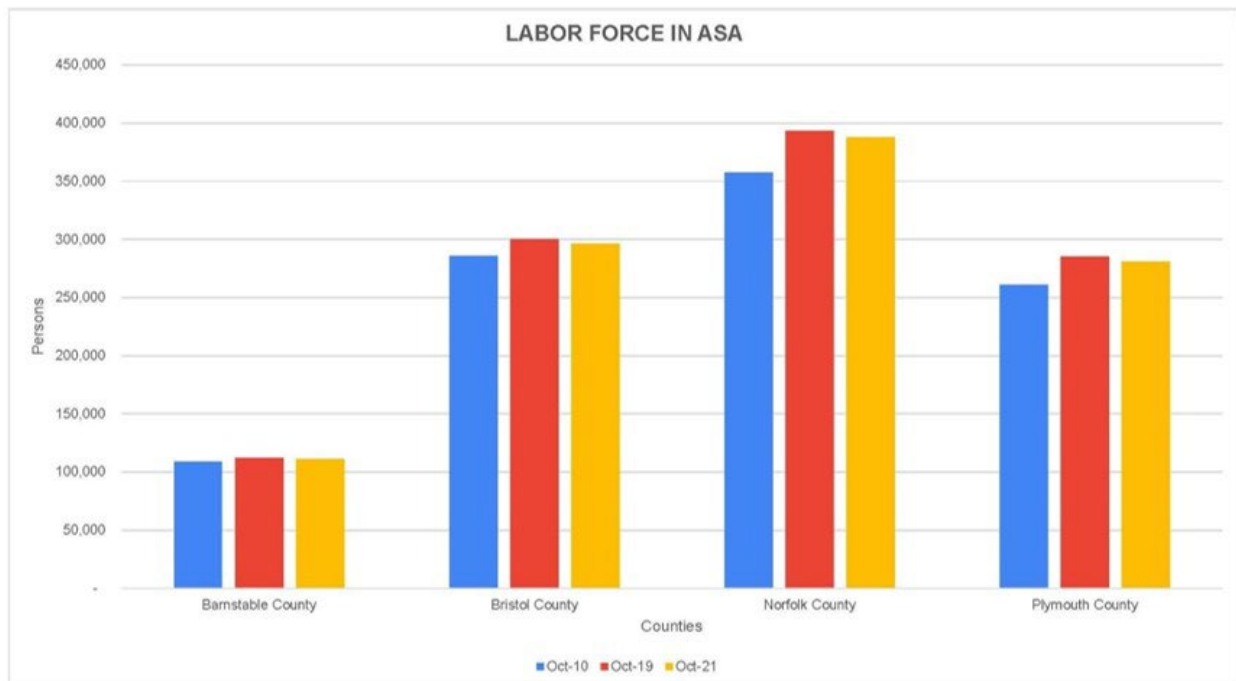


FIGURE 4-17. Labor Force chart from the TMPU (Figure 2-12).



4.3.8.4 Population and Housing

Population Demographics for the Town of Carver and the Town of Plymouth are in **Table 4-5** below. **Table 4-6** below from the TMPU shows the County of Plymouth, Massachusetts has had an average annual growth rate of 2.52% since 1930, increasing from 162,300 to 531,000 people. The growth of Plymouth County has consistently remained above the growth rate of the ASA since the 1950s.

TABLE 4-5. Population Demographics for Carver, Plymouth, and Plymouth Co, MA.

	Town of Carver	Town of Plymouth	Plymouth County
Population	11,626	61,217	530,820
Number of Households (2017-2021)	4,648	24,985	196,307
Race Percentages¹:			
White	92.6%	92.4%	83.1%
Black or African American	0.3%	1.4%	12.5%
Asian	1.5%	0.9%	1.8%
Hispanic or Latino	0.9%	2.7%	4.7%
Median Household Income	\$61,811	\$97,956	\$98,190
Per Capita Income	\$36,257	\$52,711	\$48,785
Persons in poverty (percent)	8.5%	5.6%	7.5%
Owner-occupied housing unit rate (2017-2021)	88.7%	80.9%	77.5%
Median value of owner-occupied housing units (2017-2021)	\$321,200	\$391,400	\$409,600
Median gross [monthly] rent (2017-2021)	\$1,573	\$1,588	\$1,406
Source: US Census Bureau, https://www.census.gov/data.html and https://www.census.gov/quickfacts/ (acc 8/11/23) Population Census, April 1, 2020.			

TABLE 4-6. Population Growth in the ASA for Plymouth Municipal Airport (Source: TMPU 2022).

Population Growth by ASA Municipality: 1930-2020												
Area	Population (In Thousands)										Rate of Growth	
	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020	'20-'30	'10-'20
Barnstable County	32.3	37.3	46.8	70.3	96.7	147.9	186.6	222.2	215.8	229	6.76%	0.61%
Bristol County	364.6	364.6	381.6	398.5	444.3	474.6	506.3	534.7	548.2	579.2	0.65%	0.56%
Norfolk County	299.4	325.2	392.3	510.3	605	606.6	616.1	650.3	671	726	1.58%	0.82%
Plymouth County	162.3	168.8	189.5	248.5	333.3	405.4	435.3	472.8	495	531	2.25%	0.72%

4.3.8.5 Environmental Justice

The US Department of Transportation (US DOT) defines “environmental justice” as “*the fair treatment and meaningful involvement of all people, regardless of race, ethnicity, income, national origin, or educational level with respect to the development, implementation and enforcement of environmental laws, regulations and policies*” (Order 5610.2C, 2021). Following release of EO 14008 in January 2021 and the associated *Justice40 Initiative* mentioned above, the new Climate & Economic Justice Screening Tool (CEJST) was released (ver 1.0) that the US DOT utilizes as a first step in determining if an EJ

community is within a project or study area (US DOT Justice40 website, accessed 8/10/23).

Using the federal CEJST screening tool for the Plymouth Municipal Airport project and searching the general study area, as well as the Towns of Plymouth and Carver specifically, determined that there are no designated EJ communities in the project area using CEJST criteria⁷.

Where air quality is of particular interest in the assessment of EJ communities, the US EPA’s “EJScreen Tool” provides additional information (Appendix G). The EPA’s EJScreen is an environmental justice mapping and screening tool provided that combines environmental and demographic indicators and allows users to compare designated project areas with regional and national data. The EPA indicates that this is a “pre-decisional” tool to help identify areas that may warrant additional consideration, analysis, or outreach.

4.3.8.6 Children’s Environmental Health and Safety Risks

The Proposed Action is primarily limited to the Airport study area. There is not anticipated to be any disproportionate effect on children’s health and safety as a result of the Proposed Action. This section is included here as part of the comprehensive consideration of socioeconomic factors.

South Shore Early Education is adjacent to the Airport property on South Meadow Road. Also, Federal Furnace Elementary School (Pre-Kindergarten to 5th grades) is located near the Airport approximately 0.9 miles southeast of the Runway 33 threshold (**Figure 4-15**). Carver Middle School (located approximately one mile southwest of the Airport) as well as Carver High School (located approximately 1.5 miles southwest of the Airport) are both on South Meadow Road and are within the approach to Runway 6.

4.3.9 Water Resources

This section discusses the existing conditions of potentially affected water resources including wetlands and surface waters (streams, rivers, ponds, and lakes). Note that *Floodplains* and *Groundwater* generally considered under Water Resources per FAA Order 1050.1F are not included herein, as they were determined to be a “Resource Not Affected” for reasons explained in Section 4.2.7 above.

4.3.9.1 Wetlands

The study area for the wetland evaluation included land within Airport property in the vicinity of the activities included in the Proposed Action (**Figure 1-2**).

Wetlands are transitional areas between upland ecosystems and deep water habitats. According to the 1987 USACE/ACOE Wetlands Delineation Manual, wetlands are “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, fens and similar areas.” Wetlands are federally designated by Section 404 of the Clean Water Act (CWA) as “waters of the US”. Activities involving dredging or filling of wetland areas are allowed under 33 CFR Parts 320-330 by permitting authorized by the USACE. Wetlands are protected in Massachusetts under the Massachusetts Wetlands Protection Act (WPA; MGL 131 §40) and regulations at 301 CMR 10.00.

The US Fish and Wildlife Service’s (USFWS) National Wetland Inventory (NWI) online mapping tool (<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>) shows various wetlands around the Airport, including the rectangular bogs at the southerly end of Runway 6 off of Airport property

⁷ CEJST link – <https://screeningtool.geoplatform.gov/en/#11.91/41.9077/-70.73254>; accessed 7/26/23

(**Figure 4-18**). The NWI mapping is typically used on a preliminary desktop basis to determine the potential presence of federal wetlands prior to any site reconnaissance. NWI mapping indicates potential wetland areas identified by the USFWS using aerial photography. These maps do not have any regulatory consequence, but rather approximate areas that may meet federal wetland criteria. [NOTE: The swale does not show up on the USFWS NWI Mapper as any type of water resource or flowage (neither intermittent nor perennial) and was outside of the project study area for previous project work, so it is not included under water/wetland resources (**Figure 4-18**; **Appendix F**).]

Massachusetts Department of Environmental Protection (DEP) mapping is available via MassMapper. This system provides more refined data based on the regulations under the Massachusetts Wetlands Protection Act (MGL 131 §40). NWI-mapped wetland resource areas are located throughout the Airport, as depicted on **Figure 4-18**. On-site vegetated wetlands are regulated by the WPA as Bordering Vegetated Wetlands (“BVW”) and BVWs have a 100’ jurisdictional buffer around them. Some of the wetland resource area boundaries proximate for the Runway 6 end in Carver were delineated by Epsilon Associates, Inc. in December 2016 (**Figure 4-3**, *Environmental Constraints*). The limits of BVW are coincident with the limits of federal jurisdictional vegetated wetlands, *i.e.* waters of the US. Wetlands on the Airport were delineated in accordance with the US Army Corps of Engineer’s “1987 Wetland Delineation Manual” (USACE, 1987) and the “Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)” (USACE, 2012) and the Massachusetts Wetlands Protection Act and implementing regulations (310 CMR 10.00); and the MassDEP handbook entitled “Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act” (MassDEP, 1995).

A desktop review of wetlands and review of previously field-delineated areas under the USACE and WPA requirements indicated that there wetlands in the vicinity of the proposed projects that would be affected by the work.

4.3.9.2 Surface Waters

Plymouth Municipal Airport is located at the northerly edge of the Buzzards Bay watershed. The watershed is approximately 250 square miles and drains southerly through Carver and Wareham and enters the Weweantic River before reaching Buzzards Bay. **Figures 4-2, 4-3, 4-6, 4-7, 4-10, and 4-18** illustrate surface water areas. The Airport property contains three ponded wetlands beyond the Runway 6 end, as well as two ILSF areas. There are no perennial streams, ponds, or lakes in the immediate vicinity of the Proposed Action. South Meadow Pond extends up onto Airport property at the extreme southerly end.

The Federal Water Pollution Control Act (PL 92-500, commonly called the Clean Water Act [CWA]), as last reauthorized by the Water Quality Act of 1987, requires that each state submit two separate surface water quality documents to the EPA every two years. Section 305(b) of the CWA requires submittal of a report (commonly called the 305[b] Report) that describes the quality of its surface waters and an analysis of the extent to which such waters provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities in and on the water. The second document is typically called the 303(d) List which is so named because it is a requirement of Section 303(d) of the CWA. The 303(d) List includes surface waters that are:

- 1) impaired or threatened by a pollutant or pollutant(s);
- 2) not expected to meet water quality standards within a reasonable time even after application of best available technology standards for point sources or BMPs for nonpoint sources; and
- 3) require development and implementation of a comprehensive water quality study (“Total Maximum Daily Load” or TMDL study) designed to meet water quality standards.

MassDEP maintains a list of impaired waters that do not meet water quality standards and need improvement. After the waters are listed as impaired and prior to the implementation of a TMDL study,

no additional pollutant loading that would contribute to the impairment is allowed. Therefore, new activities on the Airport in areas where surface water runoff would contribute to violations of water quality standards are required to include BMPs for stormwater pollution control. Pollutant loading from the new activity cannot be greater than the pre-existing loading. Individual Section 401 Water Quality Certification (WQC) addresses impaired waters during the 401 Certification review process.

Existing stormwater management at the Airport has evolved as stormwater regulations have changed. In the vicinity of the Runway 6 end, drainages currently associated with the area feed into an existing constructed system, downgradient detention areas, and a swale. Much of the land immediately adjacent to the Runway 6 end, Taxiway E, Taxilane A are treated via overland flow and infiltration/groundwater recharge. This area contains no stormwater structures.

Future hangar development is proposed along the Gate 6 Access Road and Taxilane A. Stormwater runoff along South Meadow Road is currently directed to a deep swale located along the north side of the Gate 4 Back taxilane. Runoff is directed to the swale either by overland flow or through catch basins and pipe. The swale is configured to function as an infiltration basin. The proposed hangar site located along Taxilane A is currently flat, undeveloped land, covered with grassland. Stormwater runoff generally flows southwest via overland flow towards the cranberry bogs.

4.3.9.3 Groundwater

The Safe Drinking Water Act (SDWA; 42 U.S.C. § 300f *et seq* 1974) protects the public health by regulating the nation's public drinking water supply. Under the SDWA, EPA has set standards for drinking water quality at the sources such as rivers, lakes, reservoirs, and groundwater wells supplying water to more than 25 individuals. The EPA oversees the states, localities, and water suppliers who implement the SDWA standards that protect the water supply from man-made and naturally occurring contaminants. The SDWA gives the EPA the authority to designate aquifers which are the sole or principal drinking water source for an area, and which, if contaminated, would create a significant hazard to public health. A Sole Source Aquifer (SSA) is one that supplies at least 50 percent of the drinking water consumed by the human population in the area overlying the aquifer where there is no other alternative to this water supply that could physically, legally, and economically supply the water.

Plymouth Municipal Airport is located in the Buzzards Bay watershed (10 digit Hydrologic Unit Code 0109000203). The Airport overlies the Plymouth-Carver Aquifer (PCA), an EPA-designated Sole Source Aquifer (**Figure 4-11**). Covering 199 square miles, including all or portions of six communities, the PCA is one of the largest designated aquifers in New England and the second largest in Massachusetts. Hydrologic studies indicate that groundwater in the PCA generally moves in a north to south direction from Middleborough toward Wareham, and in an east to west direction, toward Plymouth Harbor. As shown on **Figure 4-11**, there are no Interim Wellhead Protection Areas nor Zone II Protection areas as mapped by MassDEP on Airport property. The Town of Carver has three total public water supply wells (encompassing the North Carver Public Water Supply), and then the rest of the town has private water supplies. Additionally, all Airport buildings that are in the Town of Carver receive Town of Plymouth public water.

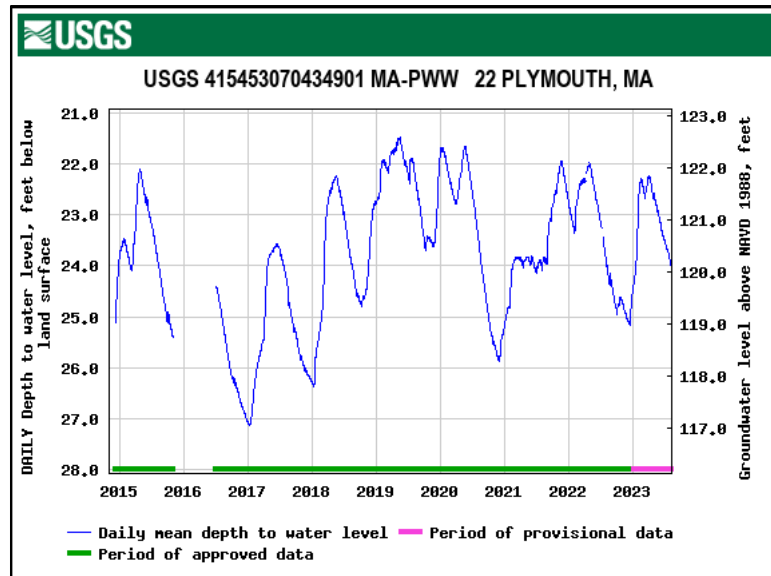
There have been multiple prior studies of groundwater at the Airport. A Groundwater Management Plan (GMP) was completed in 1992 by IEP in support of a Master Plan update that includes information on testing of soils and groundwater, groundwater contours and flow direction of groundwater at the Airport. A second study was completed in support of the design and construction of the Airport's wastewater treatment plant in 2001 by Sanborn Head Associates. These studies utilized monitoring wells placed throughout the Airport. Based on these reports, there is a local groundwater divide on the Airport. In the eastern portion of the site, ground water flow is towards the southeast. In the western portion of the site, ground water flows towards the southwest. In the area of the Runway Extension, groundwater flows in a southeasterly direction, towards Carver. Groundwater elevation is 121.5 feet

(NGVD 29) near the intersections of the runways, flowing southwesterly to an elevation of 119.5 feet by the proposed extension. The Hydrogeologic Evaluation Report (HER)⁸ for the wastewater treatment plant and leaching field for the Plymouth Municipal Airport noted “that the subsurface soils consist of a surficial stratum of loamy sand material about two feet thick, overlaying a natural, stratified deposit of highly permeable sand, which extends to a depth of at least 21.5 feet below ground surface.” Based on previous depth-to-water measurements and top-of-well casing surveys, groundwater elevations range from 118 to 121 MSL across the airport.

There is a USGS groundwater monitoring well located at South Meadow Road on the northwest side of the Airport. It came online on December 5, 2014, and monitors continuously for depth to groundwater. Data from December 2014 through August 2023 indicate that the water levels are fairly consistent with monthly and seasonal fluctuations that show similar trends (**Figure 4-12**).

⁸ Sanborn, Head, and Associates, Hydrogeologic Evaluation Report Groundwater Discharge Permit for Wastewater Treatment Facility at Plymouth Municipal Airport, 2001.

FIGURE 4-12. USGS Groundwater Monitoring Well 415453070434901 Ma-PWW graph for period from December 5, 2014 to August 9, 2023, shows fluctuating levels with seasonal variation.



The Town of Plymouth’s Public Water Division operates thirteen (13) public water supply wells, including the Federal Furnace Well which is the well closest to the Airport. The Zone II area for the well extends approximately 150’ beyond the Airport’s boundary in the wooded area along the northeast side. Additionally, there are numerous public water supplies (i.e., private wells) mapped within five miles of the Airport, along with their individual wellhead protection areas (**Figure 3-4**). The Town of Carver maintains only the North Carver Public Water Supply wells (three total wells) as public water supplies and the rest of the Town of Carver water is supplied by private wells. The public water supply wells in the Town of Carver are further away from Airport grounds than the Federal Furnace Well in Plymouth. There are not any mapped Wellhead Protection Areas (WPA) on the Airport property.

The Town of Plymouth started testing public water supply wells for PFAS (Per & Polyfluoroalkyl Substances) in 2021. The Airport has no history of using or accidental releases of Per- and Polyfluoroalkyl Substances (PFAS) containing Aqueous Film Forming Foam (AFFF) nor storage of such materials at the Airport.

PFAS are a class of synthetic chemicals that are used in consumer and industrial products.⁹ The hazards of PFAS to humans came into the public eye in the mid-2010s even though PFAS has been used in many common products since the 1940s.¹⁰ PFAS are known to be “persistent in the environment, bio-accumulate in organisms, and toxic at relatively low part per trillion (ppt) levels.”¹¹ PFAS has not been detected in the Federal Furnace Well since testing began. The results were published by the Plymouth Water Department in their annual water quality report. All wells in Plymouth were tested a total of four times and no PFAS was detected for almost all of the wells. The only well that showed PFAS was Wannos

⁹ Andrew J. R. Gillespie, Ph.D., US EPA’s Science-Based Approach to Understanding and Managing Environmental Risk from PFAS, EPA Presentation found at: https://www.epa.gov/sites/default/files/2020-09/documents/epa_pfas_rd_overview_complete_2020_09_25.pdf, September 2020.

¹⁰ Id.

¹¹ Id.

Pond Well at a concentration of 2.55 nanograms per liter; Wannos Pond Well which is below the 2024 federal standard. The Wannos Pond well is located more than 8.3 miles from the airport, and the detected PFAS is likely due to nearby sewer waste.

The Airport has conducted groundwater monitoring periodically for prior projects but does not maintain any actively sampled wells at this time. The most recent monitoring conducted in 2012 was groundwater monitoring associated with the wastewater treatment plant at the Airport which included testing levels of VOCs in the water. The Town of Plymouth, Sewer Division determined that there were no violations to the accompanying Groundwater Discharge Permit.

In addition, the Airport maintains a Groundwater Management Plan. The Groundwater Management Plan includes procedures and policies to minimize potential impact on groundwater from Airport activities and addresses the following topics: (1) storage, handling, and disposal of hazardous materials, (2) aircraft fueling, (3) maintenance of septic systems and stormwater systems, and (4) a groundwater monitoring program.

A Stormwater Pollution Prevention Plan (SWPPP) exists for the Airport and was most recently updated in September 2022 in accordance with the National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit (MSGP) that controls maintenance activities and operations on the site that have the potential to impact stormwater. The Airport conducts snow removal operations for measurable snowfall events. Snow removal operations at the Airport comply with MassDEP's Snow Removal Guidance (December 2020). Snow removed from runways, taxiways, and aprons is stored in upland areas. Some snow pile consolidation may occur as necessary. No chemicals or salt are used on the runways, taxiways, or aprons. Approximately 20 yards of "FAA sand" (very fine, 2 mm screen) are used annually. The Airport's SWPPP prohibits the use of deicing chemicals on aircraft which are deiced by heat in hangers instead. New pavement will be treated in the same manner as existing pavement.

The Airport is served by the municipal water supply. It has its own on-site wastewater treatment plant located to the west of Runway 33. This plant was constructed in 2003 and is permitted under a Groundwater Discharge Permit from MassDEP to operate at a capacity of 25,000 gpd (Permit No. 720-0). It currently handles approximately 5,000 gpd, well below its permitted capacity. Associated with the leach field for the wastewater treatment plant are three groundwater monitoring wells that are monitored quarterly for specific conductance, pH, total nitrogen, and nitrate nitrogen. MW-3 well is located near the S-1 hangar, SHA-2 well is in the middle of the leach field, and SHA-3 well is located down gradient of the leaching field. The Airport began collecting water quality monitoring data in 2002; the data indicate that nutrient loading is highest at SHA-2, which is to be expected given its location in the leach field, but minimal to non-detectable at the other two wells.

5 Environmental Consequences, Mitigation, and Permits Required

5.1 NEPA Alternatives and Significance Overview

The CEQ Regulations for Implementing NEPA (40 CFR 1500.1; 2021) state that NEPA requires Federal agencies to provide a detailed statement on proposals for **“major Federal actions significantly affecting the quality of the human environment.”** The definition for “major” is found at 40 CFR 1508.1(q). Such federal actions must fully and fairly address significant environmental effects and any reasonable alternatives to avoid or minimize effects resulting from a project upon the human or natural environment. Under 40 CFR 1501.3(b)(2) as revised in 2021, significant impact determinations must include: (i) short term and long term, (ii) beneficial and adverse, (iii) effects on human health and safety, and (iv) effects that would violate Federal, State, Tribal, or local law protecting the environment. **Significance thresholds** are evaluated differently for each of the categories as required by FAA Order 1050.1F (July 16, 2015) keeping in mind the NEPA revisions from 2021. They are summarized in Section 5.2 and are described within each impact category presented further below.

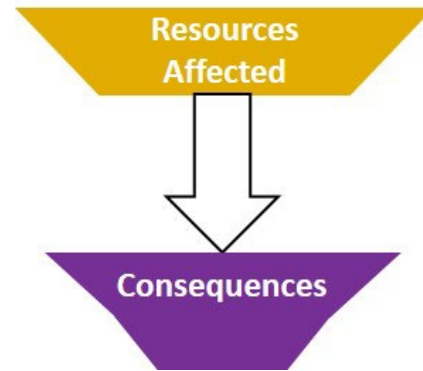


FIGURE 5-1. NEPA Step 3 – Consequences (Effects / Impacts)

In accordance with FAA Order 1050.1F, Paragraphs 4-1, 4-2, 6-2.1.f., and 7-1.1.g., this section identifies the environmental consequences of the two alternatives brought forward for further evaluation – the No Action and the Preferred Alternative. The alternatives presented are based on a conceptual (*e.g.*, less than <30%) project design, which is subject to modifications as the on-site conditions are further studied and evaluated, as well as considering agency feedback and public review process.

Note that “*impacts*” and “*effects*” are used synonymously and interchangeably throughout this section to refer to changes to the human environment from the Proposed Action or alternatives that are reasonably foreseeable and include direct, indirect, and cumulative (per 40 CFR § 1508.7 as of May 20, 2022). Per Order 1050.1F, Paragraph 4-3.2, the impacts may be both beneficial (positive) and adverse (negative). Therefore, where impacts produce a positive outcome (*e.g.*, reduced air quality impacts from fewer taxiway delays), these will be noted or discussed briefly.

5.2 Overview of Impact Categories Evaluated

This section summarizes the Affected Resources evaluation in Chapter 4. Under NEPA and FAA Order 1050.1F, the resources presented in Chapter 4 were divided into 14 categories under which certain laws are considered. Within Order 1050.1F, Paragraph 4-2.c. states, “*If an environmental impact category is not relevant to the Proposed Action or any of the reasonable alternatives identified (i.e., the resources included in the category are not present or the category is not otherwise applicable to the Proposed Action and alternatives), the reason why should be briefly noted and no further analysis is required.*” Therefore, alternatives that have been previously screened in Chapter 4 (per Order 5050.4B [706(e)]), are not addressed in this chapter.

The effects on resource areas with potential impacts are more efficiently evaluated by phase and year

and with further discussion of direct and indirect impacts in Sections 5.3-5.12 below. Section 5.12 presents cumulative impacts in a summary fashion, though the effects are expected to occur intermittently over the course of five years as related to each action.

5.2.1 Resources Not Affected

- Coastal Resources – Not present in the project area or vicinity.
- Department of Transportation (DOT) Act: Section 4(f) and LWCA Section 6(f) Resources – Not present in the project area or vicinity.
- Farmlands – No farmlands within the project area and no impacts on the farmlands in the vicinity of the project area; exempt from FFPA as “urbanized land”.
- Historical, Architectural, Archeological, and Cultural Resources – No impacts due to the Proposed Action.
- Visual Effects – No change over existing condition as a result of the Proposed Action.
- Water Resources: Floodplains and Floodways – No anticipated impacts on floodplains and floodways due to the Proposed Action; onsite stormwater controls are proposed to maintain flows at or below existing conditions.
- Water Resources: Federal/National Wild and Scenic Rivers – Not present within project area.

5.2.2 Affected Resources

Within each applicable environmental impact category, as required by Order 1050.1F Paragraph 4-2.d. and 6-2.1.f., there is a discussion of the following types of impacts (also referred to as “effects”):

- Direct effects – caused by the action and occur at the same time and place
- Indirect (including induced) effects – caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable; may include growth-inducing impacts and other effects related to induced changes in the pattern of land use, population density or growth rate, and related impacts on air, water, and other natural systems.
- Short-term and temporary impacts are described in sub-section 5.12. These include construction/equipment noise, fugitive dust, and construction equipment movement and associated traffic. The area of analysis for direct impacts is shown in **Figure 1-2** and **Figure 4-2** and the area of analysis for indirect impacts is the Plymouth Municipal Airport and, where necessary, is expanded to include adjacent parcels or properties in the vicinity. Specifically, air quality is discussed based on potential regional impacts.
- Cumulative effects are described in sub-section 5.13.

The following impact categories were carried forward from Chapter 4 for further evaluation and discussion.

- Air Quality [in attainment for NAAQS criteria pollutants; retained relating to Climate Change and GHGs, and temporary construction impacts]
- Biological Resources (including fish, wildlife, and plants)
- Climate Change

- Hazardous Materials, Solid Waste, and Pollution Prevention [retained relating to temporary construction impacts]
- Land Use [As related to Noise analysis]
- Natural Resources and Energy Supply
- Noise and Noise-compatible Land Use [anticipate no effect, but retained to present analysis]
- Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks
- Water Resources (groundwater, wetlands, surface waters)

5.2.3 Temporary Impacts

The following categories are temporary construction impacts only during the construction phases. Though Air Quality and Noise impacts are considered to be temporary, overview summaries are included as sub-sections for each following the same order as Chapter 4.

- Air Quality
- Noise and Noise-Compatible Land Use
- Construction Equipment and Traffic (air quality, potential hazardous waste, and noise)

5.3 Air Quality

The procedures for determining whether the proposed development would significantly impact air quality are described in the Environmental Desk Reference for Airport Actions (FAA, 2007) and the FAA Order 1050.1F (2020). The three overlapping regulatory processes applicable to assessing the air quality effects from airport development are Indirect Source Review (ISR); NAAQS Assessment; and General Conformity. Since the project is not an FHWA/FTA project, nor is it regionally significant, a Transportation Conformity determination is not necessary. Additionally, the Commonwealth of Massachusetts does not require indirect source permits, so that review is also not necessary.

Attainment with the NAAQS is based on data that is collected from a network of air monitoring sites across the country. The primary responsibility to ensure compliance with the NAAQS is assigned in the Clean Air Act (CAA) to the individual states and any nonattainment areas require states to establish a State Implementation Plan (SIP) to reach compliance. The FAA is responsible for ensuring that airport actions conform with SIPs, which is also known as General Conformity (Title 40 CRF Part 93). The general conformity rules only apply to areas that have been deemed to be in nonattainment or in maintenance (*i.e.*, areas that were formally in nonattainment but have been in attainment for a period of 10-20 years).

As noted in Section 4.3.1, the Airport is located in a NAAQS attainment area and therefore General Conformity does not apply. In addition, the qualitative analysis shows that background air quality is well below the current NAAQS. The proposed action will have little effect on air traffic volume (**Tables 1-2, 1-3, 1-4**) and will have minor effects on air traffic patterns (*i.e.*, direction of approach and landing), and therefore is not expected to have an adverse effect on air quality. However, temporary air quality impacts during construction periods will be mitigated as described in the Mitigation section below under “Temporary Impacts”.

5.4 Biological Resources

5.4.1 Biological Resources Overview

This section evaluates the fish, wildlife, and plants and includes various types of vegetative communities that provide wildlife habitat. This section follows the order of Section 4.3.2 (Federally-Protected Species, State-Protected Species). In addition, state-designated *Significant Habitat* information is included. Wetlands are treated separately within the “Water Resources” section below. In addition to the considerations given under NEPA, when a federal action might affect water resources, such as wetlands, Section 662(a) of the Fish and Wildlife Coordination Act (FWCA) specifically requires consideration of the project area’s biotic resources.

FAA Order 1050.1F (Paragraph 4-3.3; Exhibit 4-1; 7/16/15) includes “Factors to Consider” for Biological Resources, as “*The action would have the potential for:*”

- A long-term or permanent loss of unlisted [*sic*] plant or wildlife species, *i.e.*, extirpation of the species from a large project area (*e.g.*, a new commercial service airport);
- Adverse impacts on special status species (*e.g.*, state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats;
- Substantial loss, reduction, degradation, disturbance, or fragmentation of native species’ habitats or their populations; or
- Adverse impacts on a species’ reproductive success rate, natural mortality rates, non-natural mortality (*e.g.*, road kills and hunting), or ability to sustain the minimum population levels required for population maintenance.”

Because of the relatively small footprint of the project areas and availability of adjacent habitat areas, there are no long-term or permanent losses of plant or wildlife species anticipated at this GA Airport due to the Proposed Action (*i.e.*, extirpation of the species from the Airport). There are no anticipated adverse impacts on special status species or their habitats due to Proposed Action (based on mitigation measures described below). There will be no substantial loss, reduction, degradation, disturbance, or fragmentation of native species’ habitats or their populations. Permanent impervious surfaces of less than three (2.49) acres are proposed as part of the Proposed Action, leaving a large portion of the undeveloped areas on the 758-acre Airport still available as a function of Airport grassland management (of which 320 are mapped by NHESP as *Priority Habitat*; **Figures 4-3 and 4-13**).

Based on mitigation measures and the habitat management plan described below that avoids and minimizes impacts to the extent practicable, there will be no adverse impacts on species’ reproductive success rate, natural mortality rates, non-natural mortality, or ability to sustain the minimum population levels for population maintenance.

5.4.2 Federally-Protected Species

There are two federally protected species – Northern Long-eared Bat (*Myotis septentrionalis* – federally endangered), Plymouth Redbelly Turtle (*Pseudemys rubriventris bangsi* – federally endangered). The Proposed Action will not negatively affect these federally-listed species.

Within IPaC, a Determination Key (DKey) was completed for the Northern Long-eared Bat (NLEB), and a USFWS Consistency Letter was acquired (**Appendix H**). Based on the information provided and the

Project Description aligning with the description in Section 1.2 above, the Proposed Action will have no effect on the endangered northern long-eared bat (*Myotis septentrionalis*). *“If the Proposed Action is not modified, no consultation is required for these two species. If the Proposed Action is modified, or new information reveals that it may affect the [Indiana bat and/or] northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA section 7(a)(2) may be required.”*

The Plymouth redbelly turtle is not likely to be present within the project study area, as suitable habitat is in downgradient wetlands and further to the east (Great South Pond Watershed).

Because the preferred alternative would not alter suitable habitats for the two federally listed species, pursuant to Section 7 of the Endangered Species Act (ESA), the FAA finds that the Proposed Action would have no effect on the Northern Long-eared Bat and no effect on the Plymouth Redbelly Turtle.

5.4.3 State-Protected Species

There are four state-listed bird species as identified and described in Chapter 4 – grasshopper sparrow (*Ammodramus savannarum*) – ST, vesper sparrow (*Pooecetes gramineus*) – ST, and upland sandpiper (*Bartramia longicauda*) – SE, and eastern meadowlark (*Sturnella magna*) – SC. Several avoidance, mitigation, and management measures are proposed to reduce potential impacts on the habitat and species. These are summarized immediately below in Section 5.4.4, and temporary construction mitigation measures are described in Section 5.12.

5.4.4 Priority Habitat (State-designated)

5.4.4.1 Impacts on Priority Habitat (state-designated)

The Airport’s grassland habitats support four state-listed grassland-nesting avian species. These species and their habitats are protected pursuant to the Massachusetts Endangered Species Act (MGL c 131A) and its implementing regulations (MESA, 321 CMR 10.00). Portions of the Airport are currently managed to maintain habitat for state-listed species in accordance with the provisions of the MESA CMP (005-049.DFW, 014-240.DFW, & 018-329). The Runway 6 project (including two new hangars) will impact 6.67 acres of mapped Priority Habitat. Of this area, 2.49 acres (net of pavement removals) will result in a permanent loss of habitat while another 4.18 acres will be temporarily disturbed and restored (with appropriate seed mix) due to grading for Runway 6 extension side areas, taxiway extension, and hangar development. Finally, there will be 0.97 acres of impact from the creation of stormwater management structures. These stormwater areas will be restored with grasses after construction and continue to provide certain habitat benefits to the grassland birds at the Airport.

All projects that will occur within Priority and Estimated Habitat for state-listed species, which are not otherwise exempt from MESA review pursuant to 321 CMR 10.14, require a direct filing with the NHESP for compliance with the MESA. Comments were provided by NHESP as part of the MEPA Certificate (**Appendix E**) note that, although a formal MESA filing has not yet been submitted, NHESP anticipates, based on previously submitted information and ongoing consultations with the Proponent, that the Runway 6 project, as proposed, will likely result in a Take (321 CMR 10.18 (2)(b)) of state-listed species.

Projects resulting in a Take of state-listed species may only be permitted if they meet the performance standards for a CMP, as detailed at 321 CMR 10.23. In order for a project to qualify for a CMP, the Airport intends to demonstrate that the Proposed Action, including the Runway 6 project and other projects in the 5-year CIP, has avoided, minimized and mitigated impacts on state-listed species consistent with the following performance standards:

- (a) adequately assess alternatives to both temporary and permanent impacts on the state-listed species;
- (b) demonstrate that an insignificant portion of the local population will be impacted; and
- (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state listed species. (Note: the existing CMP can be revised, and the existing GHMP can be updated to identify the mitigation areas to offset impacts from the proposed project).

A total of 2.49 acres of Priority Habitat for state-listed bird species will be permanently altered by the proposed projects over a period of five years due to additional impervious areas associated with the 351' Runway 6 extension project or new hangar construction. A summary of projects and impacts on mapped habitat is presented in **Table 5-1**. The habitat types are shown in **Figures 5-2, 5-3, and 5-4 (Appendix A)**.

Based on preliminary conversations with the Massachusetts NHESP regarding amendments and renewal of an existing Conservation and Management Permit (CMP # 018-329, September 19, 2018; “work must be completed by” September 19, 2023), potential impacts on nesting state-listed bird species will be mitigated. Details will be determined through permitting efforts and a revised Grassland Habitat Management Plan (2018) as part of the permitting phase of the Proposed Action [also reference MESA CMP # 005-049.DFW, # 014-240.DFW].

TABLE 5-1 Summary of Impacts on Mapped Habitat

	PERMANENT IMPACTS (acres)	TEMPORARY / GRADING IMPACTS (acres)	NEW STORMWATER AREA IMPACTS (acres)
Runway 6 Extension, Aviation Hangars	2.49	12.0	0.97
Sewer Line Extension	Exempt	Exempt	N/A
Runway 6-24 Reconstruction	0	5.7	N/A
Gate 3 Taxilane Reconstruction	0	0	N/A
TOTAL	2.49	17.7	0.97

5.4.4.2 Proposed Grassland Mitigation Areas

Preliminary consultation with the NHESP has occurred prior to filing this EA/EIR (**Appendix E**). The Airport intends to continue this consultation as part of the mitigation effort, and to request a Certificate of Permit Compliance from the NHESP. As part of the mitigation efforts, the Airport proposes to update the existing

Airport-wide Grassland Habitat Management Plan (“GHMP”; 2018) in order to improve upon the comprehensive mitigation strategy that will not only provide a net benefit to the species of concern (upland sandpiper, grasshopper sparrow, vesper sparrow, and eastern meadowlark), but enable the Airport to develop Airport projects with the agreement of mitigation factors already completed. This GHMP will be submitted as part of the amended and renewed Conservation and Management Permit (CMP) application for this Project. To compensate for the Project’s unavoidable alteration of state-listed species habitat, the Airport proposes to place additional Airport property under management to improve the land’s habitat functions for the state-listed species that occur on the site, as it has done for prior projects. The Airport has acreage in a “mitigation bank”¹² from the prior construction project per the existing CMP and intends to utilize that to meet the performance standards of the CMP, along with other BMPs and modifications in consultation with the NHESP. The consultation to date has focused on the Runway 6 project. As shown on **Table 5-1**, the other projects in the Proposed Action are located in areas that have the Priority Habitat overlay map, but are existing impervious surfaces and not grassland (**Figures 1-2 and 4-2; Appendix A**).

Additional details on proposed avoidance, minimization, and mitigation measures are provided in the summary in Sections 5.13.4. No further mitigation is proposed to offset the habitat conversions of the on-airport turf areas.

5.5 Climate Change

5.5.1 Overview

The Proposed Action is primarily a series of on-Airport projects that are not anticipated to create significant amounts of new GHGs due to resulting operations. The FAA guidance includes preference for Climate Informed Scientific Approach (CISA; EO 13690 [2015], EO 14030 [2021]) for floodplain analysis, which was covered in Section 4.2.7. However, the FAA indicates, “...it is not currently useful for the NEPA analysis to attempt to link specific climate impacts to the proposed action or alternative(s) given the small percentage of [GHG] emissions aviation...projects contribute” (Order 1050.1F, 2020).

TABLE 5-2 Executive Orders Relating to Climate Change

Year	EO #	Title
2022	14072	<i>Strengthening the Nation’s Forests, Communities, and Local Economies</i>
2021	14057	<i>Executive Order on Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability</i>
2021	14030	<i>Climate-Related Financial Risk</i> [reinstated EO 13690]
2021	14008	<i>Tackling the Climate Crisis at Home and Abroad</i>
2021	13990	<i>Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis</i> [revoked EO 13807]
2018	13834	<i>Efficient Federal Operations</i> [revoked EO 13693; revoked in part by EO 13990; revoked by EO 14057]
2017	13783	<i>Promoting Energy Independence and Economic Growth</i> [revoked 13653; revoked by EO 13990]
2017	13807	<i>Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure</i> [revoked EO 13690; revoked by EO 13990]

¹² “Mitigation Bank” – determined under MESA 321 CMR 10.23)

2015	13693	<i>Planning for Federal Sustainability in the Next Decade</i> [revoked EO 13514; revoked by EO 13834]
2015	13690	<i>Establishing of a Federal Flood Risk Management Standard [FFRMS] and a Process for Further Soliciting and Considering Stakeholder Input</i> [revoked by EO 13807]
2013	13653	<i>Preparing the United States for the Impacts of Climate Change</i> [revoked by EO 13783]
2009	13514	<i>Federal Leadership in Environmental, Energy, and Economic Performance</i>

Since 1977, a series of Executive Orders (EOs) have been released with various recognitions and efforts to combat what is now referred to as Climate Change (also generally referred to as “global warming”; **Table 5-2**). More recently, as climate change increasingly becomes a recognizable phenomenon, various EOs and legislation has passed in an attempt to curb the negative impacts on humans and infrastructure (e.g., Airports, terminals/administration buildings, runways, taxiways, nav aids), as well as airport operations on the climate, see **Figure 5-5**.

There are several that specifically relate to floodplain and stormwater management, such as EO 13690 that was implemented “to improve the resilience of communities and federal assets against the impacts of flooding”. It established FFRMS and the Climate Informed Science Approach (CISA) described in Section 4.2.7 (flood elevation [“how

high”] and flood hazard area [“how wide”]). EO 14030 aims to achieve net-zero emissions for federal agencies by 2050 and set the stage for a Climate-Related Financial Risk Strategy that affects where and how the FAA spends federal dollars on projects such as those under the Proposed Action.

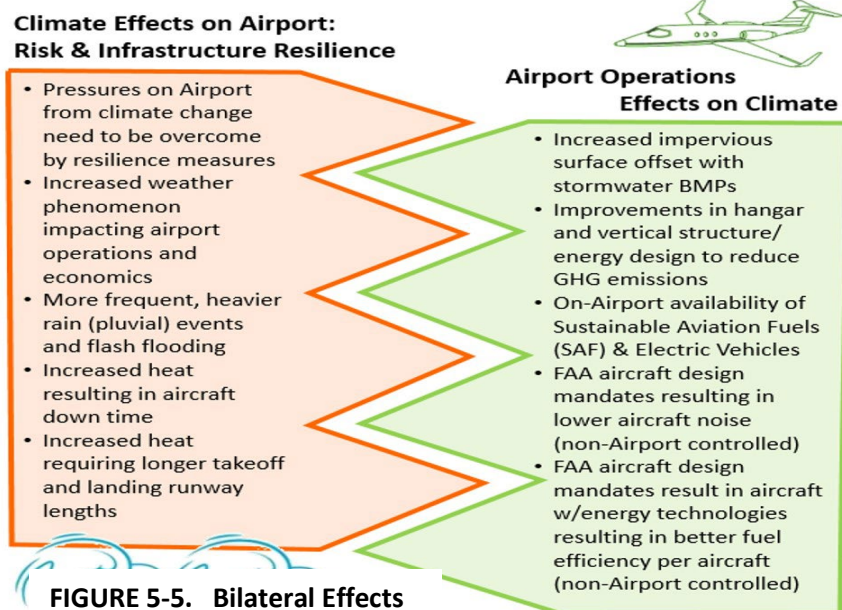


FIGURE 5-5. Bilateral Effects

Several other EOs directly affect efforts related to Climate Change and the impacts on public health and EJ communities (EO 13990 [2021], EO 14008 [2021], EO 14057 [2021]). These will be discussed further under Section 5.11 – Socioeconomics. In addition, the current federal administration (2022) launched the Initiative to Modernize Building Codes, Improve Climate Resilience, and Reduce Energy Costs. This effort is anticipated to affect approaches to design and buildings at the Airport (e.g., new hangars)

The Proposed Action is not anticipated to increase the number of aircraft using the Airport. Overall operations are expected to remain at similar levels, resulting air emissions are expected to remain well within National Ambient Air Quality Standards (NAAQS; see Section 4.3.1, Air Quality), and GHG emissions are generally projected to be reduced based on a combination of factors – e.g., introduction to the fleet of electric aircraft, phasing out of older aircraft (Stage 3 and 4 aircraft in favor of Stage 5 aircraft with reduced emissions and quieter systems [CRS 2021; FAA 2021]), and continued efforts by the

FAA that will ultimately result in the Airport benefitting from a NAS system-wide effort to make aviation cleaner, quieter, and more sustainable (FAA 2021). The Proposed Action will not result in a net increase in GHG emissions. The Proposed Action under the 5-year CIP does not contemplate Airport vehicle additions, but does include a new emergency generator and airside infrastructure (Section 4.3.1.1).

The projects under the Proposed Action are not anticipated to negatively affect Climate Change, as they are not substantially increasing the operations at the Airport. As shown in Section 1.3 above under “*Economics and Forecast*”, the number of based aircraft is projected to decrease between 2021 and 2041. The annual operations show a slight projected uptick, but that is due in part to recovery from pandemic lows (**Tables 1-2, 1-3, 1-4**). The Proposed Action would not significantly increase Greenhouse Gas (GHG) emissions compared to the No Action alternative. Overall operations are expected to remain at similar levels, and resulting air emissions are expected to remain well within National Ambient Air Quality Standards (NAAQS). As such, is not anticipated to significantly increase the number of aircraft using the Airport.

5.5.2 Airport-Specific Bilateral Climate Change Effects / Impacts

As a General Aviation (GA) airport without commercial service under FAA Part 139, Plymouth Municipal Airport adheres to the effective resulting regulations and guidance that the FAA ultimately releases related to each of these initiatives, if applicable. The Airport, in general, does not control the types of aircraft that operate at the facility, but can make improvements to ensure that the Airport is doing its part to contribute to forward-thinking and effective methods framed by the Action Plan objectives that are relevant to its operations. Though the SAF (**Figure 5-5**) are not yet available at the Airport and are NOT PART OF THE PROPOSED ACTION, there are efforts under way to work these into the system, with electrification possible in the future for both aircraft and Airport operations vehicles. The TMPU (2020) noted, “*Although no electric aircraft are forecasted to be based at Plymouth in this grouping due to a current count of zero, it is unlikely that in the next 20 years there remains zero-based electric aircraft in the fleet. It is expected that multiple electric aircraft will be added to the fleet in the next several years and that the number will continue to increase per the provided growth rate of 0.18%.*”

These future anticipated efforts are included to demonstrate that the Airport is increasingly aware of its onsite GHG emissions and the need to mitigate these impacts and is committed to actively seeking reduction measures. These specific GHG emissions are a result of Airport operations related to operational vehicles and facility usages, rather than the aircraft that utilize the Airport, over which the Airport has limited control. The FAA mandates restrictions on types of aircraft, design of aircraft, and resulting fuel emissions, noise, and so forth. The FAA offers grants to assist airports, and these are under consideration by the Airport leadership.

5.5.2.1 Effects by Airport on Climate Change

The Proposed Action is meant to improve safe takeoff and landing conditions for the aircraft that are forecasted to utilize the Airport (Tables 1-2, 1-3, and 1-4). There is a minimal increase in operations projected over the next twenty years (*i.e.*, between 2021 and 2041, an increase of only 16 operations per day of GA aircraft), so the anticipated increases in GHG emissions compared to the No Action Alternative (baseline) is minimal. Aircraft design is expected to improve over that 20 year timeframe to alleviate additional GHG emissions. Further, the vast area of open/space and grassland surrounding the pavements act as a buffer to surrounding off-airport areas and reduces the potential for “heat island” effects due to ample evapotranspiration available. “*Heat islands*” are urban areas that have higher

temperatures than rural or forested areas due to a higher percentage of impervious surfaces (e.g., roads, parking lots, buildings).

Based on the projected reduced number of based aircraft (**Table 1-3**), emergence of and likely addition of electric aircraft in the near-term (per TGPU forecast narrative), and operations (local and itinerant) that are forecasted through 2041 to be below what they were in 2000 (**Table 1-2 and Table 1-4**), no significant change from the existing condition or negative impact on the climate or GHG emissions is expected.

5.5.2.2 Effects of Climate Change on Airport

For the Buzzards' Bay drainage basin, the average temperature is predicted to increase across all seasons by mid-century with the number of extremely hot days expected to increase and the number of extremely cold days expected to decrease (Carver, 2019). The Town of Carver (2019), The Town of Plymouth, and the Airport are exceedingly aware of the impacts on the municipal infrastructure. For example, the Airport recently hosted one of eight public engagement forums as part of the "Climate-Ready Healthy Plymouth" municipal vulnerability preparedness effort (2020).

The Massachusetts State Hazard Mitigation and Climate Adaptation Plan ("State Hazard and Climate Plan", 2018), notes that under the State's Sustainable development goals, MassDOT supports climate resilience through investments that improve system reliability and modernize the Commonwealth's transportation infrastructure, including improving airport pavement conditions. The 2018 report notes that "high temperatures may also impact airplane operations. If the length of existing runways is not sufficient under higher temperature conditions, planes may not be able to take off when there is less lift available (MassDOT, 2017)". High temperatures and dense air conditions could lead to increased runway length requirements for aircraft due to diminished performance in such conditions (Resilient MA, 2018). Moreover, heat can soften the asphalt of airport runways, impairing airplane movement" (page 4-168). The proposed Project is consistent with, and responds to, future climate scenarios by adding runway length to maintain safe operations.

The potential for wildfire is one additional concern, as the potential increase in drought conditions and the associated number of extremely hot days make surrounding conditions favorable for wildfires. Barnstable and Plymouth Counties are most vulnerable due to their vegetation, sandy soils, and wind conditions (State Hazard and Climate Plan, 2018). Hot weather events are often associated with drought, as evaporation increases with temperature. High temperatures can cause vegetation to dry out and become more flammable, thereby raising the risk for wildfire.

The addition of pavement is not anticipated to result in any increases to impacts that would lessen the Airport's ability to withstand or remain resilient to future climate impacts (e.g., increased pluvial events, increased drought and extreme heat). Other impacts (sea level rise/storm surge, extreme precipitation, urban or riverine flooding) are not anticipated to result in climate impacts on the Project site that would necessitate resiliency or adaptation measures.¹³

As discussed under Section 4.2.7 – Floodplains – no floodplains are proposed to be affected by the Proposed

¹³ Note: Hurricane Sandy is the highest hurricane surge on record in 2012, and did not come far enough inland to reach the Airport.

Action (“*internal outward*”). No rivers are nearby that could flood the Airport in the vicinity of the Proposed Action (“*external inward*”). The Runway 6 project, impervious surfaces, stormwater BMPs, and aircraft hangars will be designed according to the latest FAA requirements and federal, state, and local building regulations for minimizing impacts on the assets due to storm events (see Section 5.12 – Water Resources for more information on stormwater measures). **Figure 4-10; Appendix F** indicates that there are no rivers or water bodies in the vicinity of the Proposed Action that would flood using the latest climate prediction models therein. This is one of the underlying data sources for the “*burdens data*” used by the federal Climate and Economic Justice Screening Tool (CEJST, version November 22, 2022), and is used for climate prediction by numerous federal agencies and others.

5.5.3 Climate Change Effect Summary

The projects under the Proposed Action are in line with the efforts of the Airport to be safer and more efficient. There are no anticipated effects on the Airport as a result of the Proposed Action, and no project work under the Proposed Action that will result in any effects related to Climate Change.

The No-Action alternative assumes that the Proposed Action is not implemented, and greenhouse gases from aircraft operations would remain unchanged. The No Action alternative would not result in a reduction or increase in GHG overall.

5.5.3.1 Increased Flooding

In a 2018 model of the Buzzards Bay Drainage Area conducted by the Northeast Climate Adaptation Science Center (NECASC) at the University of Massachusetts Amherst, the number of days with precipitation change (increase) 1 inch over baseline (47.8 inches) was expected to increase slightly annually with winter showing the greatest increase of the four seasons (Carver, 2019). The number of days with precipitation change 2 inches (over baseline) was not expected to increase substantially over the next century. The same study predicted, “The number of days with precipitation over 4 inches is not expected to increase annually or seasonally by mid-century or the end of the century.” The study showed that annual change in total precipitation projections varied from +0.3 to +6.8 (Carver, 2019, Table 5.).

A more recent study showed that due to climate change, the Northeast is expected to experience more frequent and intense storms, with an average annual precipitation **increase** of 4.42 inches by 2090 – 67 years from now (ResilientMA.org/maps, RCP4.5 scenario). These variations in model outputs demonstrate that the many unknowns make it difficult to project actual figures. Trying to adapt and remain resilient will be an ongoing priority for the Airport and will be a continuous effort based on continued planning and available funding.

5.5.3.2 Drought

Extended periods of drought are predicted due to climate change, with the occurrence of droughts lasting longer and the effects on water resources and operations likely. To minimize susceptibility to drought conditions, the Proposed Action and mitigation under biological resource efforts would utilize an appropriate native plant seed mix for the upland maintained grassy areas and native wetland plants within the wetland replication area. Drought is not anticipated to have any effects on the actual Runway and Taxiway pavement.

5.5.3.3 Extreme Heat

Under general climate change considerations, “*heat sinks*” are areas of earth (soil or terrain) that can absorb heat (compare to “*heat islands*” in Section 5.6.2.1). To address “*heat sinks*” and mitigate increased temperatures, the Airport will encourage green infrastructure, white roofs, landscaping for parking lots and redevelopment, where feasible (*e.g.*, Gate 3 taxilane reconstruction, new hangars).

5.5.3.4 Wildfire

The potential for wildfire is one additional concern, as the potential increase in drought conditions and the associated number of extremely hot days make surrounding conditions favorable for wildfires (Carver, 2019). The Airport will continue to be diligent in management of grasslands to prevent increased potential for airfield fires.

5.5.4 Climate Change Mitigation and Best Management Practices (BMPs)

The Proposed Action is not expected to increase GHG emissions based on very minimal forecasted increase in operations over the next twenty years (4/day every 5 years for a total of 16 additional operations/day by 2041; Table 1-4). Regardless, Plymouth Municipal Airport is committed to curbing GHG emissions through various strategies, as appropriate based on funding, construction phasing, and other factors allow. In addition to the measures listed in Section 5.4 (Air Quality), the following best management practices and minimization measures would be considered during the design phase as related to Climate Change, energy, and emissions, where applicable as part of the Proposed Action.

- Integration of low-cost energy efficiency measures,
- Installing low-energy use lighting to promote energy efficiency,
- Design of mechanical, electrical and plumbing systems to minimize operating costs while providing the highest level of control over interior building environments (*e.g.*, hangars),
- Climate change resilient design of the proposed hangars (for areas under Airport control), and
- Reduce energy consumption by monitoring the efficiency of heating, ventilation, and cooling systems.

Other elements not proposed, but contemplated under Airport planning initiatives:

- Limiting idling by aircrafts and Aircraft operations vehicles,
- Using motion sensors on lights to reduce energy waste,
- Exploring the possible installation of solar canopies at the airport parking lot on Access Road to provide cleaner energy and reduce energy costs,
- Upgrading airport maintenance vehicles and requiring low sulfur diesel fuel use by contractors,
- Carrying out regular energy audits of on-site buildings.

5.6 Hazardous Materials, Solid Waste, and Pollution Prevention

Actions funded or approved by the FAA are subject to the Resource Conservation Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). RCRA defines hazardous wastes and governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA defines hazardous substances, requires notification of releases and regulates the cleanup of any release of a hazardous substance into the environment, excluding petroleum. The EPA administers the RCRA

and CERCLA regulations.

In accordance with FAA Order 1050.1F, this category includes the evaluation of the following:

- waste streams that would be generated by the project, potential for the wastes to impact environmental resources, and the impacts on waste handling and disposal facilities that would likely receive the wastes;
- potential hazardous materials that could be used during construction and operation of a project and applicable pollution prevention measures;
- potential to encounter existing hazardous materials at contaminated sites during construction, operation, and decommissioning of a project; and
- potential to interfere with any ongoing remediation of existing contaminated sites at the proposed project site or in the immediate vicinity.

FAA Order 1050.1F, Paragraph 4-3.3 (Exhibit 4-1; 7/16/15) includes the following “*Factors to Consider*”:

“The action would have the potential to:

- Violate applicable Federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management;
- Involve a contaminated site (including but not limited to a site listed on the National Priorities List). Contaminated sites may encompass relatively large areas. However, not all of the grounds within the boundaries of a contaminated site are contaminated, which leaves space for siting a facility on non-contaminated land within the boundaries of the contaminated site. An EIS is not necessarily required. Paragraph 6-2.3.a of this Order [1050.1f] allows for mitigating impacts below significant levels (e.g., modifying an action to site it on non-contaminated grounds within a contaminated site). Therefore, if appropriately mitigated, actions within the boundaries of a contaminated site would not have significant impacts;
- Produce an appreciably different quantity or type of hazardous waste;
- Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity; or
- Adversely affect human health and the environment.”

There are substantial management and operations procedures in place to ensure that the Airport is in compliance with all applicable Federal, state, and local laws regarding hazardous materials and solid waste management. Any potential impacts are anticipated to be avoided or mitigated below significant impact levels. The Airport’s Proposed Action is not anticipated to produce any appreciably different quantities or types of hazardous or solid waste, nor is the Proposed Action likely to adversely affect human health and the environment as outlined under Socioeconomic Impacts and elsewhere in this evaluation.

5.6.1 Hazardous materials

Based upon data presented in Section 4.3.4, there is one remediated site at the Airport (**Appendix I**; closed 2016). However, it is not in the vicinity of the area of disturbance related to the Proposed Action. The Proposed Action is not anticipated to result in the release of hazardous materials and is not anticipated to generate hazardous waste. Therefore, there are no anticipated impacts associated with hazardous

materials, wastes or substances resulting from this project.

Any hazardous materials inadvertently released during construction will be reported and handled according to applicable state and federal regulations. If oil and/or hazardous material are identified during the implementation of this project, MassDEP Bureau of Waste Site Cleanup (BWSC) will be notified pursuant to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), if necessary. A Licensed Site Professional (LSP) would be retained to determine if notification is required and, if need be, to render appropriate opinions. The LSP may evaluate whether risk reduction measures are necessary if contamination is present. The MassDEP BWSC may be contacted for guidance if questions arise regarding cleanup.

5.6.1.1 Contaminated Soils Management

As noted above, there is one closed disposal site, regulated under MGL c. 21E, and the Massachusetts Contingency Plan [MCP – 310 CMR 40.0000], located on the property and upgradient of the Runway 6 project area (**Appendix I**, includes map of site locus). The historic release (RTN 4-0026005) was due to a plane crash that resulted in the sudden release of approximately 25 gallons of aviation fuel. The release impacted surficial soils, but groundwater and surface water impacts were not observed. The impacted soil was removed, and the site achieved a Permanent Solution with no Conditions under the MCP.

If contaminated media is encountered, an LSP will be employed or engaged to manage, supervise or actually perform the necessary response actions at the site for excavating, removing and/or disposing of contaminated soil or contaminated media (which includes contaminated sediment) to be conducted under the provisions of Massachusetts General Law Chapter 21E (and, potentially, c 21C) and all other applicable federal (including the Environmental Protection Agencies Toxic Substance Control Act - TSCA), state, and local laws, regulations, and bylaws. Contaminated media cannot be managed without prior submittal of appropriate plan to MassDEP (such as a Release Abatement Measure [RAM] Plan), which describes the proposed handling and disposal approach for any contaminated media encountered and health and safety precautions for those conducting the work.

5.6.1.2 Spills Prevention and Control

A spills contingency plan addressing prevention and management of potential releases of oil and/or hazardous materials from pre- and post-construction activities will be presented to workers at the site and enforced. The plan will include refueling of machinery, storage of fuels, and potential on-site activity releases. The proposed projects are not expected to introduce new sources of hazardous material storage or discharges, and do not require the use of hazardous materials for the long-term. Construction will require storing, handling and using fuels, oils and other potentially hazardous materials. These materials will be managed per industry standards and applicable federal and state laws to avoid and minimize accidental releases to the environment. A detailed spill prevention and control plan will be included in the SWPPP.

Elements of the plan relative to spill prevention will include, at a minimum, the following mitigation measures:

- Routine vehicle and equipment maintenance and re-fueling will occur only in designated areas, outside of ecological wetland resource areas and sensitive habitats. At each designated area, spill clean-up equipment will be stored for use in the event of an accidental spill.

- All fuel, oil, solvents, etc., will be stored in original containers, or in containers manufactured for

storing such material and that are clearly labeled with contents.

- The contractor(s) will immediately clean up any and all spills of fuel, oil, or other potentially hazardous materials. Any and all reportable spills will be reported to the proper authorities (Plymouth Fire Department, Plymouth Board of Health, Carver Fire Department, MassDEP, *etc.*).
- The SWPPP will include the contact information for hazardous materials release response, including the Plymouth Fire Department, Plymouth Board of Health, and MassDEP.

5.6.2 Solid Waste

General aviation airports ordinarily do not generate significant quantities of solid waste. Aviation-related activities generate only minimal amounts of solid waste. Airport buildings, hangars for storage and maintenance of aircraft, office space, and administration buildings, generate solid waste normally associated with business activity. As part of its sustainability practices, the Airport continues to examine ways to reduce waste generation through its waste management efforts, which includes waste segregation and recycling. As the Proposed Action is not intended to increase aviation activity at the Airport, the volume of solid waste generated is not expected to change.

Construction of the Proposed Action would generate construction waste. The Airport is committed to minimizing construction waste. Proposed construction activities would generate solid waste, predominantly as a result of earth moving operations. Any solid waste generated during project implementation, including construction waste, would be recycled to the extent feasible and/or disposed of appropriately per federal, state, and local regulations addressing such materials.

Waste disposal during project construction will be managed separately from normal airport solid waste management operations, and will not generate solid waste during post-construction period, *i.e.*, long-term. The Airport minimizes construction waste by recycling construction materials when it is possible to do so. Solid waste generated during construction of the Proposed Action would be reused and recycled as appropriate. *The reuse of any materials requires the submittal of a MassDEP BWP SW41 – Beneficial Use Determination – Restricted Applications.* The determination and permit “is intended to protect public health, safety, and the environment by comprehensively regulating the reuse of waste materials as effective substitutes.” [See <https://www.mass.gov/doc/instructions-sw-39-40-41-42-beneficial-use-determinations/download>.]

The primary demolition waste associated with the Proposed Action will be asphalt removed as part of Gate 3 taxiway reconstruction and Runway 6 reconstruction projects. Any asphalt, brick, or concrete (ABC) rubble associated with the Proposed Action must be handled in accordance with the MassDEP Solid Waste regulations. These regulations allow, “and MassDEP encourages”, the recycling/reuse of ABC rubble. The Airport will utilize the guidelines in the MassDEP information sheet, entitled “Using or Processing Asphalt Pavement, Brick and Concrete Rubble” (updated February 27, 2017) and the related regulations and policy (<https://www.mass.gov/files/documents/2018/03/19/abc-rubble.pdf>). Any remaining waste construction materials (*i.e.* scrap material, *etc.*) will be disposed of in accordance with state and local regulations. The Proposed Action will comply with the Solid Waste Regulations, including 310 CMR 19.017: Waste Ban, which prohibit the disposal, transfer for disposal, or contracting for disposal of certain hazardous, recyclable, or compostable items. The Airport continues its commitment to seeking ways to promote reuse, reduce waste, recycle, and reduce adverse impacts of solid waste on the environment.

Tree removal related to land clearing, and handling/processing of clean wood, will be handled according to state regulations, including 310 CMR 16.00 and 310 CMR 19.00. No wood will be buried or disposed of at the Site unless otherwise approved by MassDEP.

5.6.3 Erosion Control and Emissions

Best management practices are proposed to avoid pollution impacts due to stormwater runoff and controls for construction equipment during the construction phase. Erosion controls and other measures will be designed and implemented in accordance with best management practices and standards to ensure water quality compliance and prevent runoff. Avoidance, containment devices, and other pollution control measures will be implemented to comply with all permits and regulations. Temporary construction mitigation efforts are further described under Section 5.13.

5.7 Land Use

A Proposed Action may create conflicts or impacts when it is incompatible with existing and/or future planned land uses in the study area. Multiple definitions of “*Land Use*” in FAA regulations and guidance reinforce the concept that noise is the most likely factor in determining whether or not surrounding land uses are compatible with existing Airport operations. Noise effects are regulated under 49 US Code Section 47501 (formerly the Aviation Safety and Noise Abatement Act of 1979) and addressed in Section 5.10 below.

Incompatible land uses can also be associated with disruptions of the surrounding community, residential or business relocations, changes in vehicular traffic patterns, induced socioeconomic effects, and even off-airport effects from on-airport facilities such as lighting units. Land uses that are often most compatible with airports include industrial, commercial, farmland and open space. Many aviation infrastructure projects, including runway and taxiway extensions, have the potential to cause off-airport land use impacts. The proposed alternatives would occur largely on Airport property, and there would be no direct takings of land or land acquisition.

5.7.1 Wildlife Hazard

The FAA Order 1050.1F *Guidelines* (September 2023) specify that the presence of any of the land uses within the distances referenced by FAA Advisory Circular 150/5200-33C, *Hazardous Wildlife Attractants on or Near Airports* (2020), should be disclosed in this land use section. In identifying impacts on airport operations and attempting to mitigate for them, FAA AC 150/5200-33C (2020) provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. The airport development projects mentioned include airport construction, expansion, and renovation affecting aircraft movement near hazardous wildlife attractants. The large tracts of open, undeveloped land add safety and noise mitigation needed to comply with other regulations related to health and safety in the vicinity of operations (e.g., nearby residences) and the region (e.g., air quality). As described in Chapter 4, the entirety of the Airport, both within and outside of the safety fence, contains various habitat types, including the following generalized types: upland and wetland turf grass; upland and wetland meadows and scrub-shrub, including successional field; upland and wetland forest; open water; constructed stormwater ditches; and streams. Earthwork will convert a portion of the existing grassland/ meadow to frequently mowed turf grass. These impact areas are mostly south of Runway 6 and associated with the Taxiway A and E extensions. Refer to **Figures 5-2, 5-3, and 5-4 (Appendix A)** for details on these habitat impacts.

5.7.2 Land Use Impact Summary

All of the proposed improvement projects are located on existing Airport property and are consistent with existing aviation uses. The surrounding land use and zoning are compatible with the Airport operations, and there are no proposed zoning changes. Both Carver and Plymouth have zoned Airport Districts, which illustrate their intent and commitment to maintain land uses compatible with the airport and to preserve conditions that support it. Portions of the surrounding communities are zoned as Rural Residential or Residential/Agriculture, and noise abatement procedures are in place to diminish negative effects. Other areas around the Airport are industrial and commercial land uses which would typically not be affected by changes in operations or flight patterns. Since little or no change in Airport operations is associated with the alternatives, the land use and zoning areas are anticipated to remain compatible and no adverse effects are anticipated.

Off-site impacts are expected to be *de minimus* and consistent with ongoing activities. The proposed action will not result in community disruption, business relocations, or negative induced socioeconomic impacts (also see Section 5.11). Mitigation is not proposed specifically for land use. Mitigation specific to wildlife hazards (*e.g.*, impacts to aircraft and loss of human life) is not proposed (see Section 5.5 for mitigation specific to wildlife impacts).

5.8 Natural Resources and Energy Supply

FAA Order 1050.1F, Paragraph 4-3.3 (Exhibit 4-1; 7/16/15) indicates under “Factors to Consider” for this category, “The action would have the potential to cause demand to exceed available or future supplies of these resources.” This category addresses the project’s consumption of natural resources, including water, asphalt, aggregate, wood, along with use of energy supplies (such as coal, natural gas, and fuel for aircraft, keeping in mind the applicability to the Proposed Action).

5.8.1 Natural Resource Materials

Construction materials considered under this category would be used during construction of the Proposed Action. The highest consumption of natural resources related to the project will be the use of fill materials and asphalt to extend the taxiway and install the new stub taxiways. This will result in additional new asphalt surfaces and the related materials.

The total amount of fill materials presented in **Table 5-2** for the new and reconstructed surfaces is grossly estimated and not specifically designed for the designated areas in accordance with FAA design requirements under Advisory Circular (AC) 150/5320-6G (June 7, 2021), as the Proposed Action is only at the conceptual phase (<30% design for Runway 6 extension projects in 2025) and has not yet been designed for the other projects. These calculations are approximate totals and the assumption is that the total will be comprised of offsite virgin materials and reuse of existing onsite materials, as described under Section 5.7 regarding reusable asphalt.

The new pavement materials are anticipated to be sourced from readily available regional commercially available locations. Material from existing stockpiles on the airport property could be used as a source of fill pending availability and suitability evaluations (see Section 5.7). In addition, topsoil would be brought onto

the site. Construction activities would also use other typical building materials such as asphalt, aggregate, and drainage pipes. All of these materials are typically readily available in the region, so the Proposed Action would not consume any materials that are anticipated to be in short supply.

TABLE 5-3. Estimated Volumes of Common and Reused Materials for New and Reconstructed Surfaces

Year	Project Area	Imported Common Fill, Gravel, & Reused Materials (CY)
2024	Water/Wastewater Extension (~1400 LF)	In situ placement of new subgrade lines
2025	Runway 6 extension (351'x75'xdepth – grossly assume 30")	2,437 CY
	Taxiway A extension (700'x35'xdepth – grossly assume 24")	1,815 CY
	Taxiway E extension (1000'x35'xdepth – grossly assume 24")	2,593 CY
	MALSF pad and VASI (estimate 10'x10' x 6 units x 18" depth)	5.5 CY
	Glideslope Pad (estimate 20'x20' x 24" depth)	30 CY
	Glideslope Access (estimate 400'x15' x 12" depth)	2,667 CY
	Old Glideslope	No earthwork, just pavement demo; possible materials reuse
	Gate 3 Taxilane Reconstruction (160'x330'x full depth – assume 24")	3,911 CY
2026	Runway 6 Reconstruction (partial depth rehabilitation; <4,650'x75'xdepth – grossly assume top layer 10")	10,764 CY
	Emergency Generator infrastructure/pad (10'x10' x depth – assume 18")	5.5 CY
[TBD]	Hangars x 2 (100'x100' = 10,000x2=20,000 x depth – assume 24")	1,481 CY
TOTAL ALL YEARS		25,709 CY

5.8.2 Energy Consumption

During construction, there would be a temporary increase in energy consumption; this temporary increase can be accommodated by local supplies. Any additional lighting associated with potential construction, such as for runways, associated taxiways, approach lighting system, and ramp lighting would require additional energy but it should be easily accommodated within the regional network based on existing capacity requirements. Any improvements to the Airport's power distribution system and the use of new materials (e.g., fixtures, transformers and cables) will improve the efficiency and reduce energy requirements. In particular, the installation of LED light fixtures in new construction, or installation via retrofit of existing lighting, would reduce per-light energy use while increasing fixture longevity.

5.8.3 Fuels

The proposed safety improvements are not anticipated to significantly increase aviation activity at the Airport (Tables 1-2, 1-3, 1-4). Therefore, the use of aviation fuels at the Airport is not anticipated to increase substantially. Assuming no change in the type of aircraft (Stage 3 and Stage 4), the use of aviation fuels at Plymouth Municipal Airport would increase minimally due to increased use of the facility. Though slight, additional aviation demand may also result in the need for additional fueling infrastructure. Therefore, any such fuel usage increases would be tied directly to the growth of the aviation business. However, given FAA advances in supporting Sustainable Aviation Fuels, electric aircraft, phasing out of older aircraft and phasing in newer Stage 5 aircraft, and other energy reduction

measures, the minimal increase in forecasted aircraft operations is anticipated to be offset. [See Section 5.4 – Air Quality regarding emissions, and Section 5.6 – Climate Change regarding GHGs.] During any future construction, there would be a temporary increase in energy/fuel consumption to power the construction that will be irrevocably lost to the project. However, this should be easily accommodated by the local supplies. Propane is available from several dealers.

5.8.4 Water and Sewer

The Proposed Action would also require the use of energy and water for construction activities, generating additional output into the sanitary sewer system. While unknown at this time, the future hangars may potentially hold one aircraft with a capacity of 3-6 passengers per aircraft, totaling a wastewater generation of approximately 30-60 gallons per day. As noted above, the Airport operates an onsite wastewater treatment plant with the capacity to treat 25,000 gpd, the increase in wastewater flows is well within the airport's capacity of the existing wastewater treatment plant. All of the municipal systems have adequate supply of these resources, and BMPs would be implemented to conserve water and power during construction to the extent possible.

5.8.5 Impact Summary

The FAA has not established a significance threshold for natural resources and energy supply in FAA Order 1050.1f. Rather the one factor includes “...whether or not the Proposed Action would have the potential to cause demand to exceed available or future supplies of these resources.” The factor given “...is not intended to be a threshold” (FAA 1050.1f Desk Reference, v4, September 2023). The Proposed Action would not affect the energy use from electricity, heating oil, and propane/fuel beyond the temporary impact from construction activities. There will a negligible change on energy consumption – the NAVAIDs are primarily relocations and will not require additional energy draws. Construction activities are anticipated to self-support their energy needs and not draw from the Airport.

The proposed new taxiway and runway lights will not result in significant impacts on energy use beyond the existing condition. The Proposed Action will have no significant effect on energy consumption at the airport, nor will the use of any rare materials or natural resources in short supply required for the actions proposed in this EA. For these reasons, impact on the energy supply and natural resources are anticipated to be minimal in conjunction with the Proposed Action.

5.9 Noise and Noise-compatible Land Use

5.9.1 Executive Orders and FAA Noise Reduction Implications

As part of FAA's continuing efforts, especially multiple recent Executive Orders (EOs) that have been released since 2009 (Section 5.6.1, Table 5-2), efforts to address climate change, GHGs, fuel emission reductions, and noise have been at the forefront of research. EO 14008 (January 27, 2021) required agencies to develop “Climate Action Plans” that outlined each agency's plans and proposed actions to address Climate Change. Within the FAA's 2021 Aviation Climate Action Plan, a multi-pronged approach was outlined that included significant efforts to **reduce noise**.

In addition to the FAA Action Plan, the Congressional Research Service (CRS) produced a summary report (2021) outlining Airport Noise Regulations and Programs that provides an in-depth review of FAA efforts through regulations, studies and community outreach, and research and design collaborations with

aircraft manufacturers. Newer aircraft, both conventional engine and electric, are being designed to be quieter (Stage 4 and Stage 5), and older aircraft that are noisier and less fuel efficient are being phased out over time (Stage 3; Stage 1 and 2 banned long ago). With advances in noise reductions, the FAA has estimated that the number of Americans exposed to *significant* levels of aircraft noise has fallen from 7 million in the 1970s to 430,000 in 2018 (CRS 2021).

The Airport does not control aircraft design restrictions, but has a responsibility to control operations that serve to reduce noise. For many years, the Airport has had a full noise abatement plan and procedures in place to direct pilots and aircraft on flight procedures that will reduce noise to neighboring communities (**Appendix L**). Appropriate zoning controls and development permit review processes protect the local community and airport operations.

5.9.2 2007 Noise Study

Based on an earlier noise study in 2007 (**Appendix J**), along with an updated analysis using the Aviation Environmental Design Tool (AEDT) presented below, noise contours at the threshold limits due to the Proposed Action are contained within Airport property and Noise would be considered a “*Resource Not Affected*”. However, it is carried forward to present the impact analysis, as well as take into consideration noise associated with temporary construction of the Proposed Actions.

Title 49 of the US Code (49 USC 471 [Airport Development] § 47101[a][2], [c] and [h]) established the national policy to minimize the current and projected noise impacts that result from the construction of and operation of aviation facilities. The FAA has determined that the cumulative noise energy exposure of individuals to noise resulting from aviation activities must be established in terms of the day-night average sound level (DNL), which is a 24-hour average sound level in decibels (dB).

Under FAA Order 1050.1F, paragraph 4-3.3, the Significance Threshold for Noise and Noise-Compatible Land Use is:

“The action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the No Action alternative for the same timeframe. For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB.”

FAA Order 1050.1F, Paragraph 4-3.3 (Exhibit 4-1; 7/16/15) indicates under “Factors to Consider” for this category,

“Special consideration needs to be given to the evaluation of the significance of noise impacts on noise sensitive areas within Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks; national wildlife and waterfowl refuges; and historic sites, including traditional cultural properties) where the land use compatibility guidelines in 14 CFR part 150 are not relevant to the value, significance, and enjoyment of the area in question. For example, the DNL 65 dB threshold does not adequately address the impacts of noise on visitors to areas within a national park or national wildlife and waterfowl refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute.”

As noted in Section 4.2.2, there are no Section 4(f) properties within the project area or adjacent vicinity in consideration.

5.9.3 2023 Noise Modeling

The FAA does not require full Part 150 AEDT noise studies for GA airports, as they are typically conducted for larger Part 139 commercial airports (e.g., Boston Logan International). FAA Part 150 *Noise Control and Compatibility Planning for Airports* is a voluntary FAA program that sets guidelines for airport operators to document aircraft noise exposure, and to establish noise abatement and compatible land use programs.

FAA Order 1050.1F, Appendix B indicates that no noise analysis is needed for the following projects:

- Those involving Design Group I and II airplanes (wingspan less than 79 feet) in Approach Categories A through D (landing speed less than 166 knots) operating at airports whose forecast operations in the period covered by the NEPA document do not exceed 90,000 annual propeller operations (247 average daily operations) or 700 annual jet operations (2 average daily operations).
- Projects involving existing heliports or airports whose forecast helicopter operations in the period covered by the NEPA document do not exceed 10 annual daily average operations with hover times not exceeding 2 minutes.

Because the number of jets exceeds the FAA threshold for noise analysis (700), this information from the 2011 Master Plan is presented and supplemented with an updated noise analysis based on the current Proposed Action and Preferred Alternative of a 351' extension of Runway 6 within the project. Noise modeling using the FAA-approved Aviation Environmental Design Tool (AEDT) system was completed using 2021 data. The Airport's total annual operations were 61,021, of which 4,271 were jets (Section 1.2, **Table 1-2** and **Table 1-4**; **Table 5-4**; also see *TMPU*, 2023).

Under the TMPU, the design aircraft is the Dassault Falcon 2000 (**Table 5-4**), and the future design aircraft is likewise the Falcon 2000. This aircraft have an approach speed and wingspan that classifies them in the ARC B-II group. Based on that condition, the Airport Reference Code (ARC) is B-II, so the RSA width is 150 feet and the length beyond the end of the runway is 300 feet. These factors result in lower noise levels under the current proposed conditions.

An update to the previous Environmental Overview Noise section written in 2011 (**Appendix J**) was needed to address the potential changes the 351' runway extension to runways 6-24 would have on the environment. In 2022 the Plymouth Municipal Airport Technical Master Plan Update was written and the following will illustrate the changes and similarities between the 2011 Plymouth Master Plan and the 2021 Technical Master Plans Update. Contours for the 2023 NEPA EA were generated using the Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT) Version 3d area (**Appendix K**).

TABLE 5-4. Based Aircraft Used in AEDT Noise Contour Analysis

2021 B-II Operations			
Aircraft	Approach	Departure	Total
Falcon 2000	75	75	150

Falcon 900	37	37	74
Citation Latitude	35	35	70
Citation Excel	35	35	70
Hawker 4000	27	27	54
King Air 350	63	63	126
Total B-II Operations for 2021			544
Source: DuBois & King			

5.9.3.1 2022 Technical Master Plan Forecast Review

Historical data provided by the FAA Terminal Area Forecast (TAF), shows a decrease in based aircraft at Plymouth over the previous 25-year period. Prior to the turn of the century, Plymouth reported 179 based aircraft, which fluctuated over the next 20 years, decreasing rapidly after the 2008 recession, climbing again in 2015, and decreasing once more by 2020. Today the based aircraft count at PYM is 105. Compared to the 2011 Master Plan Forecast, that's a difference of 37 fewer based aircraft. The number of business jets based at PYM was also reduced from 9 aircraft in 2007 to 5 aircraft in 2021.

Given the limitations of certain data sources, an average of Invisible Intelligence GARD data and FAA 5010 data was used to form the accepted baseline, which was compared to FAA TAF and MassDOT System Plan forecasts for accuracy. The average baseline for 2021 is 60,021. This baseline was used to create the forecast for aircraft operations for Plymouth for the forecast period (2021–2041). The baseline operations can further be defined by fleet mix: the number and percentage of the total operations of 61,021 aircraft types. Single-engine aircraft comprised 68% of the operations, with the next highest aircraft type shown as Turbo-props.

Additionally, the operational data was separated by Aircraft Approach Category and Airplane Design Group. The Airplane Design Group (ADG) is an FAA-defined grouping of aircraft types based on wingspan and tail height, while the Aircraft Approach Category is an FAA-defined grouping based on aircraft approach speed. PYM is currently designated as a B-II airport and each runway, taxiway, taxilane, and apron are designed with this in mind. This method was not practiced in the 2011 Master Plan but it should be noted that the Critical aircraft from the 2011 Masterplan was the Hawker 850 which falls under the B-II ADG. In the 2021 Technical Master Plan Update, the Dassault Falcon 2000 was dubbed the critical aircraft as it made the majority of the B-II operations. The critical, or design aircraft is defined as the most demanding aircraft that either operates or is projected to operate at least 500 or more itinerant operations annually. Itinerant operations are defined as operations between one location and another, and therefore local operations that begin and end at PYM are not considered in this calculation. At many small airports, a single aircraft type does not meet the 500 operation minimum and so the FAA allows a composite of several aircraft types to meet the minimum operational number. For Plymouth, a composite of aircraft that operate in and out of Plymouth regularly was developed.

What the Summary of Forecast (**Table 5-5**; 2021-2041) revealed was although the GA operations showed slight annual growth (0.43%), specific groups like the single-engine and multi-engine aircraft who fall under ADG A-I which makes up 95.2% of total operations at Plymouth are on the decline. The second largest ADG that contributed to 1.8% of total operations fell under B-II. As noted before, the Hawker 850 was the Critical Design Aircraft from 2007 but it was replaced by the Falcon 2000 in the 2022 Forecast. Both aircraft fall under the ADG B-II and both can be considered “Business Jets” given the portion of the GA industry they serve.

TABLE 5-5. Summary of Forecast (2021-2041) from 2022 Technical Master Plan Update

Summary of Forecast (2021-2041)					
Forecast Period	Base Year 2021	2026	2031	2041	Average Annual Growth Rate
Operations	61,021	62,344	63,696	66,489	0.43%
Itinerant	27,919	28,522	29,136	30,411	
Local	33,102	33,822	34,560	36,078	
Based Aircraft	105	102	101	95	-0.24%
Single Engine (SE)	79	75	72	65	-0.90%
Multi-Engine (ME)	10	10	10	9	-0.40%
Turbo-Prop	7	7	8	8	0.60%
Turbo-Jet	5	6	6	8	2.30%
Rotorcraft	4	4	5	5	1.40%
Forecasted Operations by FAA Grouping					
AAC/ADG		Operations		% Total Operations	
A-I		63,845		95.2%	
A-II		759		1.1%	
A-III		3		0.0%	
B-I		419		0.6%	
B-II		1,222		1.8%	
B-III		3		0.0%	
C-I		98		0.1%	
C-II		105		0.2%	
C-III		3		0.0%	
Source: DuBois & King					

The difference in total operations when the 2007 Forecast (**APPENDIX J**) as compared to the 2022 Forecast tells a similar story. In the 2007 Forecast, 68,843 operations were expected by 2017 and 86,374 operations by 2027. In 2021, the base year for the 2022 Forecast, total operations were 61,021. Almost 8,000 fewer operations than where PYM was expected to have five years earlier and a difference of over 25,000 fewer operations to where PYM was forecasted to see in the next five years. Contributors to this difference could be found in the number of fewer based aircraft at PYM. The 2007 Forecast estimated that by 2017 there would be 162 based aircraft. In 2021, the based aircraft count was 105. With fewer aircraft on the field, there would be fewer operations annually.

5.9.3.2 2023 Noise Study

From the 2022 Technical Master Plan Update's (2021-2041) Forecast, although the number of operations has increased slightly since 2011 when the last Master Plan was completed, the results were not as high as expected by 2022. Therefore, PYM has remained an ADG B-II airport. Information typically required to perform a noise analysis includes the number of aircraft operations by the time of day, aircraft type, number of operational runway usage, departure and arrival profiles, and flight tracks.

The base year aircraft operations were determined by the annual operation count of B-II aircraft from 2021 for PYM (see **Table 5-5**, 2021 B-II Operations). Each aircraft makes up more than 10% of the annual B-II operations at PYM with the Falcon 2000 topping the list at 30%. Aircraft operations were modeled with half of all operations using Runway 6-24 (with the 350' extension to RWY 6) and half using Runway 15-33. A model was then constructed with a 24hr annualization to illustrate the 2021 Noise Contours

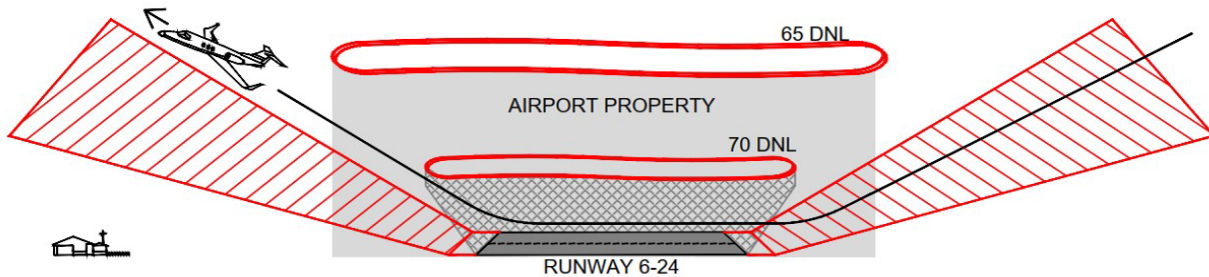


FIGURE 5-7. Profile illustration of 65 DNL and 70 DNL contours based on AEDT model output. (NOT TO SCALE)

(See **Appendix J**, **Figure 5-6**), plan view and **Figure 5-7** above, profile/cross-section view). The contours associated with the Proposed Action remain within the **Airport property boundary at the Runway 6 extension end.**

5.9.4 Noise Abatement

The Airport has had a formal noise abatement program in place for many years, and the documents are on the website for the following four elements (**Appendix L**):

- Aircraft Approach – flight procedures and a map provided for pilots and aircraft to minimize noise impacts on surrounding residential communities (https://pymairport.com/aircraft_arrival_noise_abatement)
- Corporate – flight procedures and a map depicting a “quicker right” turn off of departure from Runway 6 (heading northerly off the RW 24 end) and a “slow left” turn off the Runway 24 departure heading southerly off the RW 6 end towards the bogs on the southwest end of the Airport (https://pymairport.com/corporate_noise_abatement)
- General Aviation (non-corporate jet) – flight procedures for three runway departure patterns with maps identifying “noise sensitive” areas (https://pymairport.com/ga_noise_abatement)
- Helicopter – map depicting helicopter departure patterns that avoid specific noise sensitive areas (https://pymairport.com/helicopter_noise_abatement)

The Airport works to identify the nature of all noise complaints and works diligently to minimize noise impacts whenever possible.

The FAA prohibits Airport-mandated restrictions of flight paths, hours of operation, and undue prohibition of open access to airports. Therefore, the Airport’s noise abatement program can only be voluntary. The Airport is prohibited by federal law from levying fines, restricting hours of operation, or restricting access to the airport (or the route by which an aircraft has access to the airport) to aid with noise abatement. Pilots have ultimate control over their flight procedures to ensure safe takeoff and

landings based on weather patterns and other factors. The Airport must rely solely on the continual notification, education, and compliance of aircraft operators. Noise abatement is dictated by safety considerations as well as federal law. Plymouth Municipal Airport works with pilots utilizing the Airport on a voluntary basis to abate and mitigate noise issues as much as possible.

If operations were to increase at the airport, or additional infrastructure added, the potential for expanding non-compatible land-uses within the 65 DNL could present unwanted impacts on the local community. Local planning agencies should take steps to prevent incompatible land-uses within noise contours and other airport operating surfaces (*i.e.*, critical areas, FAR Part 77 surfaces and RPZs).

5.9.5 Temporary Construction Noise

There are anticipated noises associated with temporary construction activities that require large equipment utilization for the Runway 6 and Taxiway A/E extensions, Taxiway 3 and Runway 6 reconstruction and other smaller projects. Short-term noise impacts due to the Proposed Action over the course of the three-year construction window (2024-2026) will be limited to temporary impacts associated with construction activities. Minimization and mitigation to offset the temporary impacts is proposed as presented in Section 5.13 below. No additional mitigation measures are proposed due to the proposed project actions occurring entirely within the project area.

5.10 Socioeconomic, Environmental Justice, and Children’s Health & Safety Risks

5.10.1 Socioeconomics

Aviation infrastructure projects have the potential to directly or indirectly affect socioeconomic conditions in surrounding communities. CEQ regulations at 40 CFR 1500, specifically 1500.1, 1508.1(g), and 1508.1(m), require that the “human environment” be addressed concerning the relationship of people with their natural and physical environments. These effects may include, but are not necessarily limited to, shifts in populations, incomes and growth patterns, public service demands, business and economic activity changes, creating a notable change in employment, and disruption to established neighborhoods.

Socioeconomic impacts may also lead to other, induced or “secondary” resource impacts. For example, aviation projects causing increased noise or requiring land acquisition could affect residential settlement patterns. These changes could, in turn, cause impacts that alter demands on fire and police protection, educational or utility services, businesses, and job opportunities.

The FAA has not established a significance threshold for the Socioeconomics sub-category. Guidance within Order 1050.1F, Paragraph 4-3.3 (Exhibit 4-1; 7/16/15) “Factors to Consider” includes:

“The action would have the potential to:

- Induce substantial economic growth in an area, either directly or indirectly (*e.g.*, through establishing projects in an undeveloped area);
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities; or
- Produce a substantial change in the community tax base.”

The proposed alternatives do not require households to relocate, alter public service demands, and are not anticipated to reduce the local tax base or change the assessed value of local properties. The proposed alternatives are not of the size or magnitude to alter the community’s transportation patterns, public services, utility services, business facilities, or employment opportunities.

The Airport is operated as a revenue-generating entity, and as such, plans and operates in a manner that attempts to anticipate projected growth and income opportunities. Furthermore, no increases to other City services (such as Fire) are anticipated as a result of the proposed project. As described in Section 5.13 below, the Proposed Action is expected to have little or no effect on ground traffic conditions (other than during construction). There will also be a buffer of forested land between the proposed work and residential properties to the east. A lighting plan will be prepared during the design phase of the project that will meet FAA standards for airport lighting.

Additional aircraft forecasted to utilize the airfield could have some minimal adverse noise impacts on the surrounding residential community, though the noise model in Section 5.10 illustrates the study contours are within the Airport boundary. The increases are very minimal over the twenty year forecast (4 more operations/day over each 5-year window; Table 1-4). There are substantial noise abatement procedures in place to avoid and minimize those impacts (see Section 5.10; **Appendix L**). There is some industrial development off the end of Runway 15, but as this type of development is considered to be compatible with airport operations, it should not be a concern for airport development.

In addition, the alternatives are not anticipated to induce adverse socioeconomic effects such as shifts in populations and growth patterns, public service demands, and business and economic activity changes. Mitigation is not proposed.

5.10.2 Environmental Justice

Environmental Justice was introduced in Sections 1.5 and 4.3.8 and outlined substantial considerations for FAA and Airport efforts to include EJ communities and outreach throughout the planning process for the TMPU and environmental assessment.

The FAA has not established a significance threshold for the Environmental Justice sub-category. Guidance within Order 1050.1F, Paragraph 4-3.3 (Exhibit 4-1; 7/16/15) “Factors to Consider” includes:

“The action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population, due to:

- *Significant impacts in other environmental categories; or*
- *Impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines are unique to the environmental justice population and significant to that population.”*

Executive Order 12898 (1994) requires consideration of project impacts on minority and low-income populations. Updates to the NEPA regulations by the CEQ (July 16, 2020) only requires evaluation within the NEPA framework of direct impacts and those impacts that are “*reasonably foreseeable and have a reasonably close causal relationship*”.

Several more recent EOs tie climate change, public health, and EJ concerns together for consideration. EO 13990 (2021) *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*

and EO 14057 (2021) *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* incorporated EJ considerations into sustainability and climate adaptation planning, programs, and operations. EO 14008 *Tackling the Climate Crisis at Home and Abroad* included the Justice40 Initiative aimed at directing certain federal investments might be made toward a goal that 40% of the overall benefits flow to disadvantaged communities. One of the tools used in this initiative is the Climate and Economic Justice Screening Tool (CEJST). The dataset upon which the tool relies includes new projected flood risk data from First Street Foundation's Climate Risk Data Access from 2022 (which was included under Section 4.2.7 - Floodplain).

In addition, the EPA EJScreen Tool provides data for multiple parameters, including air quality, public health parameters, flood and coastal surge risk data, and other information regarding potential EJ impacts. The results of the EJScreen (**Appendix G**) indicate that there are no disproportionate effects on EJ communities in the vicinity of the Proposed Action.

5.10.3 Impact Summary

The Airport and this Proposed Action actively seek fair treatment and meaningful involvement of all citizens in the EA process. The Proposed Action is meant to provide improved airport safety to all users. The Project is located within one mile of an EJ population. The Project is not anticipated to have disproportionate impacts on EJ populations. Impacts anticipated will be minor and temporary primarily due to construction related activities.

The Proposed Action would not result in a negative or adverse regional impact and would not trigger shifts in land use, rapid population growth, high public service demands, negative pressure over business and economic activity, disruption or displacement of established neighborhoods, uncontrolled urban proliferation, increased public service (utility) demands, or incompatible changes on transportation or traffic patterns.

All work is proposed on Airport property to meet FAA requirements. The Proposed Action is primarily for safety improvements and not to facilitate substantial increased Airport operations or cause substantial growth or change the type or size of aircraft using the Airport (Tables 1-2, 1-3, 1-4). Therefore, impacts on nearby communities and other potential socioeconomic impacts are not expected. There are no disproportionate impacts to Environmental Justice communities. The proposed Project will not modify existing Airport uses, therefore, the proposed action will not modify environmental health or safety risks from existing conditions.

5.11 Water Resources

The Clean Water Act (CWA) grants statutory authority to the federal government to establish water quality standards; control discharges into surface and subsurface waters; develop waste water treatment systems and practices; prevent or minimize the loss of wetlands; regulate project siting with regard to an aquifer or sensitive ecological areas such as wetlands; and regulate other issues concerning water quality. CWA Sections 401 and 404 address the protection of water quality and waters of the US, including wetlands, respectively. Under the CWA, the EPA has implemented industrial wastewater standards and water quality standards for all surface water contaminants.

The EPA administers these controls through the NPDES permit program which regulates the point discharge of pollutants into waters. The Proposed Action will require permitting under NPDES (Section 5.17). For purposes of NEPA, water resources are evaluated in four sub-categories following the same order as

presented in Chapter 4, Affected Environment:

- 1) Wetlands
- 2) Floodplains (Resource Not Affected by Proposed Action; Section 4.2.7)
- 3) Surface Water
- 4) Ground Water

Each sub-category is evaluated using a different set of Significance Thresholds and “Factors to Consider” as given in FAA Order 1050.1F, Paragraph 4-3.3 (Exhibit 4-1; 7/16/15) and included within each applicable sub-section below.

5.11.1 Wetlands

As described in Chapter 4, the Airport property contains several notable wetland areas. Those wetlands within the project area were delineated most recently in 2016 (**Figure 4-3**). The Proposed Action as currently planned would not directly impact wetlands. An evaluation by the FAA determined that the relocation of the glideslope would not require a relocation or realignment of the Gate 6 Access Roadway and perimeter fence line within the project area. Therefore, no impacts to wetlands are proposed.

5.11.2 Surface Water

The Significance Thresholds designated for Surface Water by the FAA at 1050.1F, Paragraph 4-3.3 (Exhibit 4-1; 7/16/15) are:

“The action would:

1. Exceed water quality standards established by Federal, state, local, and tribal agencies; or
2. Contaminate public drinking water supply such that public health may be adversely affected.”

The FAA has provided further guidance under “Factors to Consider”, which includes:

“The action would have the potential to:

- Adversely affect natural and beneficial water resource values to a degree that substantially diminishes or destroys such values;
- Adversely affect surface waters such that the beneficial uses and values of such waters are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization.”

Plymouth Municipal Airport is located in the Buzzards Bay watershed and has multiple procedures in place to protect surface water quality. Snow removal is conducted by Airport personnel using the Airport’s truck-mounted plows and brushes. The impervious surfaces of the runways, taxiways and aprons are treated with sand (without the addition of salts or urea). The proposed alternatives will not relocate or change aircraft deicing procedures.

A SWPPP is required at the Airport since it is considered to be a municipally owned industrial facility under NPDES Phase II of 40 CFR 122.26(b) (14) (i)-(xi). As an air transportation facility, the Airport needs authorization to discharge surface waters under the General Permit for Stormwater Discharges Associated with an Industrial Activity for typical stormwater runoff from the entire exposed facility surface. This general runoff from proposed new impervious surfaces, turfgrass areas, and other project components will be

treated using permanent stormwater BMPs, including LID and green infrastructure, as practicable and within budget and other constraints. These BMPs will follow the guidelines, to the extent practicable. One goal of such treatment is to not exceed pre-construction discharge rates for certain storm events. The volume of stormwater that needs to be accommodated by the proposed BMPs is therefore substantially greater than the runoff generated on the airfield.

As the project proceeds, there will be additional research into stormwater management options, and coordination with MassDEP and other agencies as appropriate to ensure the design meets all requirements to the extent practicable. Mitigation is anticipated to occur by implementation of stormwater control measures that will be determined and designed as the project is advanced.

The Airport property contains three ponded wetlands beyond the Runway 6 end, as well as two ILSF areas (**Figures 4-2, 4-3, 4-6, 4-7, 4-10, 4-18**). The alternatives would not affect the vernal pool, potential vernal pool, or the intermittent ponded area. There are no streams or rivers directly affected by the Proposed Action. All appropriate state and federal permits will be acquired for the work affecting surface waters as a result of this project (see Section 5.17 for a list). These permits will be adhered to and incorporated into the design and construction plans and specifications of the project.

The Proposed Action is at the conceptual phase (<30%). Potential water quality impacts would be mitigated through effective stormwater management and soil erosion and sediment control measures implemented as part of the design process, in accordance with all governing local, state and federal requirements and oversight during any construction. Erosion and Sediment Control Plans will need to be approved by the governing municipalities (Plymouth and/or Carver) and/or other governing agencies prior to any construction activities. Furthermore, all construction activities will need to comply with the latest FAA Advisory Circular 150/5370-10H (12/21/2018, or as updated) Standards for Specifying Construction on Airports. The design and construction of any proposed facilities can be done in such a manner as to minimize or eliminate the potential of water quality degradation through a prudent storm water management program.

5.11.3 Construction Mitigation

Construction period stormwater management will ensure protection of adjacent surface waters and wetlands as described below.

5.11.3.1 Construction Period Stormwater Management

The proposed action is not anticipated to have negative impacts on water quality. Because it will disturb more than one acre of land, it will need to be conducted in accordance with the NPDES Construction General Permit. The proponent will prepare and implement a SWPPP pursuant to the NPDES Construction General Permit to protect the quality of receiving waters during construction. The built conditions will include stormwater best management practices to control the quality and quantity of runoff directed to receiving waters for the long-term.

In addition, construction activities will comply with the latest FAA Advisory Circular 150/5370-10H Standards for Specifying Construction on Airports. Grading associated with runway, taxiway, taxilane, and hangar construction, construction access, storage and laydown areas have the potential to cause short-term erosion and sedimentation in the vicinity of sensitive areas. The existing gravel maintenance access road will be used for construction access as much as possible. Side slopes will be stabilized and

re-vegetated as soon as practicable. Properly designed erosion control measures will be used throughout the construction period.

5.11.3.2 Post-Construction Stormwater Management

Stormwater runoff from the Project area will be managed through; 1) the Airport's existing stormwater management system, and 2) the installation of a new drainage system in each discrete project area. The stormwater management system will be designed to prevent an increase in peak stormwater runoff and to provide treatment when and where necessary. To meet this goal, management of runoff will include both temporary and permanent Best Management Practices ("BMPs") so that runoff will be appropriately managed both during and after construction. The proposed stormwater management system will be designed to comply with MassDEP's stormwater management regulations to the extent practicable. The designs may include LID and green infrastructure where practicable. The BMPs proposed for the Project are expected to meet the goal of no increase in peak stormwater runoff and provide stormwater treatment where needed. A series of deep sump catch basins and oil water grit separators will be constructed to collect the runoff from Taxiway D and Taxiway E. The oil water and grit separators will target runoff from areas with higher pollutant loads such as the fueling station and apron adjacent to Taxiway E.

5.11.4 Groundwater

This section evaluates the potential environmental consequences of the proposed project over a sole source aquifer. The analysis focuses on the potential impacts on groundwater quality, hydrology, and the surrounding environment, and considers both direct and indirect effects. Existing wells and WHPAs are shown on Figure 4-11, Groundwater/Aquifers, in Appendix A.

Construction Phase

Construction will require storing, handling and using fuels, oils and other potentially hazardous materials. These materials will be managed per industry standards and applicable federal and state laws to avoid and minimize accidental releases to the environment. A detailed spill prevention and control plan will be included in the construction period SWPPP. Elements of the plan related to spill prevention will include, at a minimum, the following mitigation measures:

- ◆ Routine vehicle and equipment maintenance and re-fueling will occur only in designated areas, outside of ecological wetland resource areas and sensitive habitats. The fuel transfer operation shall be conducted by a contractor knowledgeable of the location and use of the project area spill kit.
- ◆ The contractor will have available at all locations where work is taking place, a spill kit containing a covered 55-gallon drum, a supply of an oil absorbent solid such as speedy-dri, oil-dry or other similar material, a shovel, and a yard brush, along with absorbent pads, pillows, or sausages. Heavy diesel equipment and fuel transfer vehicles will have a supply of absorbent pads and a five-gallon bucket.
- ◆ All fuel, oil, solvents, etc., will be stored in original containers, or in containers manufactured for storing such material and that are clearly labeled with contents. Small containers (i.e., 5 gallons or less) may be stored on site in a tight locked job box.
- ◆ The contractor(s) will immediately clean up any and all spills of fuel, oil, or other

potentially hazardous materials. Any and all reportable spills will be reported to the proper authorities (Plymouth and/or Carver Fire Departments, Plymouth and/or Carver Board of Health, MassDEP, etc.).

- ◆ The SWPPP will include the contact information for hazardous materials release response including the Plymouth and/or Carver Fire Departments, Plymouth and/or Carver Boards of Health, and MassDEP.

Operational Phase

The runway and associated infrastructure will add significant impervious surfaces, increasing the volume of stormwater runoff and reducing groundwater recharge. Runoff can carry pollutants, fuel, and oil residues. Routine operations involving the handling of aviation fuel and other chemicals pose a risk of accidental spills, which can infiltrate the soil and contaminate the aquifer. Emissions from aircraft and ground vehicles can deposit pollutants on surfaces that are washed into the groundwater during precipitation events. Emergency operations can also impact surface runoff and soils.

Hydrological Impacts

The increase in impervious surfaces may alter the natural recharge of the aquifer, potentially reducing the quantity of groundwater available for extraction and impacting the sustainability of the water supply. The conceptual stormwater system has been developed in accordance with MassDEP Stormwater Management Standards for water quality volume, recharge volume, Total Suspended Solids (TSS) removal and Standard 2 (no increase in runoff for the 2, 10 and 100 yr storms). Models were used to size the system to meet the standards for the current 100-year storm (7.49") and evaluate the proposed system under the 2050 10-year storm (6.1") and the 2070 25-year storms (7.9") size scenarios (to address climate resiliency). These higher storm totals would be expected to require upsizing the pipes, (i.e., increase pipe diameter), and one of the infiltration basins. A rough estimate of the increased cost and a description of the modelling is provided in Table 5-1 below.

Appendix M contains pre- and post-drainage plans for the project area. WS-1 shows the Airport watersheds S1 (27 acres) and S2 (13.8 acres), paths of storm flow travel, and associated Point of Analysis (POA) for the discharges into wetland area. Sub-watershed S1 captures the stormwater runoff from the proposed pavements north of the centerline for the proposed Runway 6 end extension. The sub-watershed S2 captures stormwater runoff associated with the proposed pavements south of the centerline to Runway 6, and treatment is provided via the stormwater control measures identified above.

The conceptual stormwater treatment system includes 50 foot wide vegetative filter strips, swales, sediment forebays, grassed channels and infiltration ponds to provide TSS removal, prior to discharge into infiltration basins. The infiltration basins were sized larger than the requirements for water quality volume (1" per acre) and Recharge (0.6" per acre). The sediment forebays were sized greater than the requirements (0.1" per acre impervious). The infiltration basin designs were checked against all storm sizes (i.e., current 100 year, 2050 10-year and 2070 25 year) and met the standard for no increase in runoff. A Low Impact Development (LID) design approach protects the natural ability of the site to capture precipitation, treats stormwater runoff, and enhances recharge to the local water table. LID is achieved by applying a range of techniques. Key principles to LID include preserving the site's natural features, using vegetation in buffer strips and in rain gardens and using vegetated areas to slow down runoff; maximize infiltration and reduce contact with paved surfaces.

No Action Alternative

The No Action alternative does not meet the purpose and need of the project. The No Action Alternative assumes that the existing Airport footprint and associated infrastructure would remain unchanged if the Proposed Action is not implemented.

It is assumed the Proposed Action would qualify for permits associated with impacts to water resources. Permit conditions and approvals would ensure the proposed activities would not violate water quality standards. In addition, the Proposed Action would not adversely affect functions or substantially alter the hydrology of wetlands, floodplains, and surface waters as discussed. Based on the above, impacts would be mitigated and reduced below the significance thresholds established by the FAA.

5.12 Temporary Construction Impacts and Mitigation

In accordance with FAA NEPA guidance in the 1050.1F Desk Reference (February 2020), short-term, temporary impacts are separated out from long-term, permanent impacts (prior to mitigation). Construction activities during the construction phase of this project are anticipated to have localized effects on the built and natural environment in the immediate areas of construction as well as short duration impacts on the Airport's operations. Effects resulting from construction activity are anticipated in the following areas, which are described below. Note that Roadway Traffic and the Local Transportation System are considered here, along with short-term, temporary Air Traffic and Airport Operations effects. These are not all contained within the 14 NEPA categories originally listed, but are given consideration as related to BMPs for potentially affected resources (*e.g.*, noise, air quality, and water resources) to emphasize the need to implement impact avoidance measures. All construction-period mitigation measures are listed in the draft Section 61 Findings (Appendix P).

- Roadway Traffic/Local Transportation System
- Noise
- Air Quality
- Surface Water
- Wetlands
- Vegetation
- Wildlife
- Hazardous Materials
- Air Traffic / Airport Operations

All construction activities will be managed in accordance with applicable MassDEP regulations regarding Air Pollution Control (310 CMR 7.01, 7.09-7.10), and Solid Waste Facilities (310 CMR 16.00 and 310 CMR 19.00, including the waste ban provision at 310 CMR 19.017), and other applicable regulations. Construction phase impacts and mitigation relative to state-listed species, wetlands, stormwater, noise, air quality, water quality, and traffic are described below, along with truck routes and other mitigation measures that may be implemented to minimize impacts on residential areas by trucks travelling to the site during construction.

5.12.1 Roadway Traffic/Local Transportation System

The Proposed Action would not significantly affect the volumes of air traffic or vehicular traffic to and from the Airport over the long term. However, during the construction period, there could be a temporary increase in heavy truck traffic on local roads. The estimated Average Daily Trips (adt) will vary depending on phase of the project and year, but for the larger projects (*e.g.*, Runway 6 extension phase, Runway 6 reconstruction, Gate 3 taxiway reconstruction) is projected to occur in very narrow windows similar to other reconstruction projects (*i.e.*, days to weeks rather than months or years). **Table 5-6** below shows a gross

estimate of adt based on the earlier calculations under Section 5.9.1 (**Table 5-3**) above. The result is approximately 9 adt for diesel dump trucks over the course of the 3-year construction period. The peak period is estimated to be during the reconstruction of Runway 6-24 in 2026, resulting in approximately 22 adt over a 90-day timeframe. Based on the short-term construction phases, no Transportation Demand Management (TDM) measures are projected due to construction.

Providing access to the site, material storage sites (if off-site), construction staging areas as well as truck traffic for the transportation of the excavated material will temporarily impact the transportation network and surrounding areas. Truck and construction traffic will be commensurate with typical large, short-term construction projects. The anticipated volume of truck traffic per day does not trigger a formal traffic or impact study. This roadway was designed to accommodate heavy truck traffic associated with the existing concrete ready-mix plant, asphalt pavement plant, and landfill operations in the project corridor.

Access to the site and transportation of the material must be carefully planned and coordinated to preserve the movement of traffic and the quality of pavement throughout the immediate area. Construction traffic volumes and traffic patterns will be coordinated with Town officials prior to construction and when the end-user of the excavated material is identified since this will dictate the route for the truck traffic. Impacts are anticipated to be short-term in duration; therefore, mitigation is not proposed. Any damage to area roadways caused by specifically due to construction of the proposed project will be repaired as part of the proposed project.

The construction contract will require contractors to use several measures to reduce potential emissions and minimize impacts, as appropriate and if available, from construction vehicles including:

- Encouraging contractors to use EPA Tier 4 construction equipment or equipment retrofitted with diesel emission control devices to the greatest extent practicable;
- Using Ultra-Low Sulphur Diesel for all trucks and construction machinery;
- Use of after-engine emissions controls, such as oxidation catalysts or diesel particulate filters;
- Maintaining an “idle free” work area;
- Minimizing exposed storage of debris on-site through measures such as wetting soils prior to disturbing and covering stockpiles.

TABLE 5-6. Estimated Average Daily Trips (adt) for Diesel Vehicles Over 3-Year Construction Period

Year	Project Area	Imported Common Fill, Gravel, & Reused Materials (CY)	Total # Dump Trucks (assume 16 CY each)
2024	Water/Wastewater Extension (~1400 LF)	In situ placement of new subgrade lines	[assume no new materials; onsite only]
2025	Runway 6 extension (351'x75'xdepth – grossly assume 30")	2,437 CY	152
	Taxiway A extension (700'x35'xdepth – grossly assume 24")	1,815 CY	113
	Taxiway E extension (1000'x35'xdepth – grossly assume 24")	2,593 CY	162
	MALSF pad and VASI (estimate 10'x10' x 6 units x 18" depth)	5.5 CY	0.34 (<1)
	Glideslope Pad (estimate 20'x20' x 24" depth)	30 CY	1.9 (<2)
	Glideslope Access (estimate 400'x15' x 12" depth)	2,667 CY	167
	Old Glideslope	No earthwork, just pavement demo; possible materials reuse	0
	Gate 3 Taxilane Reconstruction (160'x330'x full depth – assume 24")	3,911 CY	244
2026	Runway 6 Reconstruction (<4,650'x75'x partial depth – grossly assume 10")	10,764 CY	673
	[Peak Truck Trip Period = ~ 90 days; adt peak ~22 trips/day]		
	Emergency Generator infrastructure/pad (10'x10' x depth – assume 18")	5.5 CY	0.34 (<1)
[TBD]	Hangars x 2 (100'x100' = 10,000x2=20,000 x depth – assume 24")	1,481 CY	93
TOTAL ALL YEARS		25,709 CY	1,606 Total Truckloads
/365 = per day (ALL YEARS combined)		70 CY/day [varies per year]	(4.5 x 2 back/forth) = 9 adt [varies by year/project]

5.12.2 Noise

Temporary noise effects results from construction activities and include noise generated from heavy equipment, truck traffic, and other construction activity. Construction noise will be generated by construction vehicles and construction equipment performing earth work, paving and delivering construction materials. These construction activities will be carried out during normal daylight hours but are anticipated to occur over a duration of 3 to 4 years (2024-2026). While construction activities may be audible from this or other nearby residences and businesses in closer proximity of the nearby business parks, the effects are considered to be temporary and depend upon the nature of the operation. Construction noise is also intermittent and depends on the location and function of the equipment. Impacts are anticipated to be short-term in duration. Best management practices (BMPs) will be implemented to reduce noise, such as:

- Requiring all construction equipment to be equipped with exhaust mufflers, and requiring mufflers to be maintained and lubricated to minimize engine noise;
- Mufflers on construction equipment leaving airport property and passing through sensitive areas;
- Muffling enclosures on continuously running equipment, such as air compressors and welding generators;
- Measures to limit noise from machinery or trucks as they traverse streets in noise sensitive areas (schools, churches, wildlife/conservation areas);
- Specifying site construction hours of normal daytime hours 7 AM to 5 PM to avoid early morning, evening, and night time periods to minimize disturbing the adjacent receptors;
- Scheduling equipment operations to keep average noise levels low, to synchronize the noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels;
- Turning off idling equipment;
- Locating noisy equipment at locations that protect sensitive locations by shielding or distance.
- Ensuring construction vehicle operators abide by the Massachusetts Vehicle Idling Regulations (Massachusetts 5-Minute idle Law), idling of construction equipment would comply with 310 CMR 7.11;
- Replacing specific construction operations and techniques by less noisy ones where feasible;
- Selecting the quietest of alternative items of equipment where feasible; and,
- To the extent practicable, specific activities such as crushing and pulverizing, as well as equipment staging areas, would be located at appropriate distances from residential receptors.

5.12.3 Air Quality

Construction and operation activities shall not cause or contribute to a condition of air pollution due to dust or odors in accordance with 310 CMR 7.09 Dust, Odor, Construction, and Demolition. Air quality impacts during construction of the Proposed Action are primarily temporary in nature and limited to the Airport property. Construction activity may have some temporary, short-term adverse effect on ambient air quality, primarily in the area immediately adjacent to the area of disturbance. Construction activity would result in the short-term emission of air pollutants originating from fugitive dust and as the by-product of construction equipment fuel combustion. The emission of such pollutants would be reduced by the use of properly maintained and operated construction equipment and by the use of tarp covers on trucks transporting refuse and construction materials to and from the site. Impacts are anticipated to be short-term in nature.

As mentioned in 5.13.1 and shown in Table 5-6, the estimated Average Daily Trips (adt) will vary depending on phase of the project and year, but for the larger projects (*e.g.*, Runway 6 extension phase, Runway 6 reconstruction, Gate 3 taxiway reconstruction) is projected to occur in very narrow windows similar to other reconstruction projects (*i.e.*, days to weeks rather than months or years). Dust and odor related to construction and demolition would be controlled in accordance with applicable regulations.

Potential measures to mitigate air quality impacts from the construction activities include:

- Implementing dust abatement techniques (*e.g.*, water application) on unpaved or unvegetated surfaces to minimize airborne dust during construction;
- Revegetating disturbed areas as soon as possible after disturbance. This could include interim revegetation along road beds, once heavy construction is completed; and
- Covering construction materials and stockpiled soils if they are a source of fugitive dust.
- Encouraging contractors to use EPA Tier 4 construction equipment or equipment retrofitted

with diesel emission control devices to the greatest extent practicable (e.g., EPA-verified, CARB-verified, or MassDEP-approved diesel oxidation catalysts (DOCs) or Diesel Particulate Filters (DPFs)).

- Maintain a list of the engines, their emission tiers, and, if applicable, the best available control technology installed on each piece of equipment on file for MassDEP departmental review.
- Using Ultra-Low Sulphur Diesel for all trucks and construction machinery.
- Maintaining an “idle free” work area and ensuring construction vehicle operators abide by the Massachusetts Vehicle Idling Regulations (Massachusetts 5-Minute idle Law), idling of construction equipment would comply with 310 CMR 7.11 (efforts to include driver training, periodic inspections by site supervisors, and posting signage to limiting idling to five minutes or less on-site);
- Minimizing exposed storage of debris on-site through measures such as wetting soils prior to disturbing and covering stockpiles to avoid fugitive dust.

5.12.4 Surface Water

Soils will be disturbed by construction activities during excavation and grading. The exposure of the soils to erosion processes during rain events has the potential to affect water quality in receiving waters. Water quality may be adversely affected by increased concentrations of suspended solids and the introduction of contaminants that may be adsorbed onto sediment particles or dissolved in runoff waters. In addition, pollutants associated with accidental spills related to construction activities can be transported to receiving waters.

Surface water impacts from construction activities will be minimized by the use of soil erosion and sediment controls. These BMPs will follow current state and federal guidelines and will be detailed in the SWPPP prepared to comply with the current NPDES Construction General Permit (CGP). Proper maintenance and inspection will be followed to minimize the discharge of pollutants in receiving waters. Impacts on surface waters are not anticipated. Therefore, mitigation is not proposed.

5.12.5 Wetlands

The project as currently designed and based on the assumption that the pending FAA analysis and subsequent design will not result in direct impacts on wetlands or their jurisdictional buffers. Even so, the project will be required to develop a Stormwater Pollution Prevention Plan (SWPPP) in accordance with its NPDES CGP to manage stormwater during the construction period. The SWPPP will include management measures that will be implemented during construction and potential construction period dewatering activities and associated permitting and identify mitigation measures. All construction-period mitigation measures are listed in the draft Section 61 Findings (**Appendix P**).

Construction activities in and adjacent to wetlands have the potential to cause temporary direct and indirect impacts, such as the disturbance and removal of vegetation by vehicles and equipment, the exposure of soils causing soil erosion and sedimentation within wetlands.

If additional temporary wetland impacts are determined to be necessary as part of construction, these impacts will be coordinated with the regulatory agencies (with appropriate permitting) ahead of time. Impacts on vegetated areas will be minimized by limiting clearing and grubbing activities to only those areas necessary for project construction. Areas surrounding construction activities will be restored to original contours, where practicable, and all construction debris will be removed. Wetland resource areas are

located along the south side of the Gate 6 access road. A small round light fixture will be relocated to just south of the access road. This light fixture is part of the Runway 6 medium intensity approach lighting system (MALS) which consists of seven sets of light fixtures used for the navigational approach to Runway 6 that will be shifted southwesterly with the runway extension. A portion of the 100-foot buffer zone to an isolated vegetated wetland (IVW) in Carver will continue to be maintained via mowing in accordance with FAA requirements. 13,867 square feet of buffer zone will be maintained, see **Figure 5-2**. This area was previously cut in 2018 for obstruction removal and grassland habitat viewshed creation. There will be no ground disturbing impacts to this upland buffer zone.

Accordingly, a NOI will be filed with the Carver Conservation Commission under the local Bylaw as this IVW is not subject to review under the WPA. The NOI will provide a general overview of the Project and a more specific description of the shrub clearing work proposed within the buffer. The NOI narrative will describe how the project has been designed to conform to applicable regulatory performance standards including erosion and sediment control requirements.

5.12.6 Rare Species and Critical Habitats

All activities will comply with MESA Conservation and Management Permit(s). In locations where the construction activity is located within existing wildlife habitat, there will be a decrease in the quality of habitat immediately adjacent to the project due to increased noise levels, vehicular movement, increased lighting and other human activities during the construction phase. However, after construction has been completed, it is expected that species displaced by construction will return and utilize the remaining habitat.

Where rare species occur in the vicinity of proposed activities, field visits in advance of construction will occur during the growing season to demarcate areas where construction equipment must avoid. Additional field visit(s) may occur during specific periods to ensure the demarcated areas are accurate and may be adjusted to encompass populations or specimens.

5.12.7 Hazardous Materials and Solid Waste

Involvement with hazardous material is not anticipated to occur; however, if construction activities encounter contaminated soil, surface water or groundwater all state and federal regulations will be followed and worker protection measures will be implemented. (Also refer to Section 5.7).

5.12.8 Air Traffic / Airport Operations

There will be short-term interruptions to the Airport's operations and the construction work will require Notice to Airmen (NOTAM) and ongoing communications between the operations staff and contractor(s). Runway 6-24 is proposed to be shut down during the construction/reconstruction periods and the glideslope relocation. If an emergency landing was necessary during this timeframe, the Airport would communicate with the construction contractors as necessary. There should be no impact on Runway 15-33 during the work other than redirection of air traffic to that runway.

5.13 Indirect, Cumulative, and Segmentation Effects

The proposed project is not expected to result in any negative or long-term significant indirect or cumulative impacts.

5.13.1 Indirect Effects

Under NEPA, “indirect effects” are those “*caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable*”. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8). The proposed project is not expected to cause any significant indirect impacts in any of the impact categories that have been considered. All impacts are expected to occur only at the specific locations where construction will occur. The potential for indirect impacts occurring later on or distant from the site due to on-going operations at the hangars will be minimized by the mitigation measures described herein, such as proper stormwater management, noise control measures, and light emissions control. The Proposed Action will not create any significant secondary air quality impacts as the projects are not expected to significantly affect the amount of air traffic (**Tables 1-2, 1-3, 1-4**).

5.13.2 Cumulative Effects

The CEQ regulations at 40 CFR § 1508.1(g) (revised April 20, 2022) define “cumulative effects” as “*effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.*” Therefore, this evaluation considered those effects that are “reasonably foreseeable” and within the geographic area of concern for this analysis, which is generally the Airport and its immediate vicinity, *i.e.*, the land adjacent to the Airport. For some resources, such as water quality or traffic, impacts may extend further and the geographic area of concern is larger.

This section takes into account recent Airport projects, those included in the *TMPU (2023)*, and other past, present, and reasonably foreseeable future projects located within the project vicinity. Past projects include Reasonably foreseeable projects include miscellaneous projects anticipated to occur on and around the Airport property within the next five years.

In terms of other potential future development, the Carver and Plymouth Master Plans (2017 and 2006, respectively) recommend that growth be concentrated in the area around the Airport South Meadow Road. These areas are targeted because they are already developed for non-residential uses, they have the necessary transportation facilities in place, and the land uses are considered compatible with the airport.

5.13.4 Summary of Cumulative Effects

The resources affected by this project include noise, wetlands, water quality, and state-designated Priority Habitat and four state-listed bird species. The project will have minimal effects on other resources, so the project’s contribution to overall effects on those other resources will be negligible, and they are not addressed in this analysis. Potential effects on each of these resource is briefly summarized below.

5.13.4.1 Noise

The Proposed Action will not result in any expansion of the noise contours beyond the Airport property at the Runway 6 end. Based aircraft and resulting operations may increase slightly at the airport over the long term (**Tables 1-2, 1-3, 1-4**). Noise impacts associated with construction will be short term and last only as long as the construction project. Impacts will be minimized through conscientious construction management and implementation of BMPs. Construction of the reasonably foreseeable future projects, of which the majority of the projects are pavement reconstruction, would have

temporary noise impacts minimized through project planning with no long-term adverse impacts.

5.13.4.2 Wetlands

Past wetland impacts occurred as part of the Runway 15-33 end extension in 2013. The wetland resource area impacts included permanent fill of 1.1 acres of BVW and vegetation removal in approximately 13 acres of wetland resource areas. Permanent wetland impacts resulting from filling were replicated at a 2:1 ratio to meet mitigation requirements under the Plymouth Wetlands Protection Bylaw and the Massachusetts WPA. Federal wetland mitigation resulting from filling and secondary impacts resulted in the preservation of over 40 acres of land.

Subsequent work was presented in the 2018 EA for Taxiway D and Master Plan Improvements. No wetlands were in close proximity to projects in that EA. Mitigation for the loss to grassland habitat at that time included the conversion of forested and scrub upland areas to grassland in an area located off the end of Runway 6 in Carver, contiguous with existing mitigation areas. The conversion required work within state and local jurisdiction buffer zones to wetlands, as well as tree cutting within the wetlands themselves. No fill or other alteration was required. All work in vegetated wetlands required authorization from USACE pursuant to Section 404 of the CWA, and concomitantly from the Carver Conservation Commission pursuant to the Massachusetts WPA.

The current Proposed Action will not result in any impacts to wetlands, as the only location where work occurs in the vicinity of wetland resources as part of the proposed CIP improvements is at the southerly end of Runway 6. Implementation of MassDEP and EPA Best Management Practices for wetlands and groundwater protection will be implemented.

5.13.4.3 Water quality

The Proposed Action will increase the amount of impervious surfaces. Permanent BMPs will be implemented to minimize effects on receiving waters. Temporary BMPs will be implemented during construction to minimize input of sediments or other pollutants in receiving waters. It is assumed other past or future actions have or will comply with applicable laws and regulations and implement appropriate temporary and permanent BMPs, and that these measures will prevent significant impacts on surface waters.

5.13.4.4 Rare Species

The Project will involve a conversion of approximately 2.5 acres of NHESP-mapped Priority Habitat for the grasshopper sparrow, vesper sparrow, eastern meadowlark, and upland sandpiper to impervious area for the construction of the runway, taxiway extensions, taxiway reconstruction, runway reconstruction, two hangars, and backup generator infrastructure. These habitat areas are now managed habitat under the Airport's Grassland Habitat Management Plan (GHMP; 2018). To mitigate potential impacts, additional acreage will be added to the area managed under the Airport's GHMP and an Airport-wide management plan will be developed during MESA permitting as detailed in Section 5.5 in order to provide a net-benefit to the listed species.

5.14 Mitigation Summary

The CEQ Regulations at 40 CFR § 1508.20 define mitigation as including:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action;
- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
- (e) Compensating for the impact by replacing or providing substitute resources or environments.

Several of the components have been minimized over the previously proposed and permitted project elements. Specifically, the Runway 6 extension at the south end has been reduced from 850 feet down to 351 feet due to the Airport’s concerns regarding potential impacts on the neighboring communities and potential environmental impacts. Mitigation measures were included in each of the subsequent categories in Sections 5.4-5-12 above with construction phase mitigation measures detailed in Section 5.13.

The goals of the mitigation measures are to reduce or eliminate significant impacts that could occur as a result of construction or operation of the Proposed Action, see **Figure 5-8 and 5-9**. In addition, Best Management Practices (BMPs) are briefly noted under Temporary Project Impacts to address measures anticipated to offset construction phase impacts.

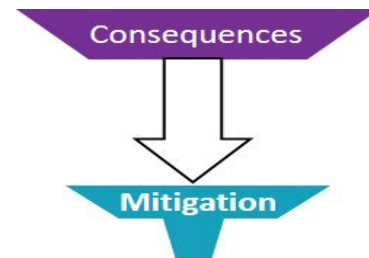
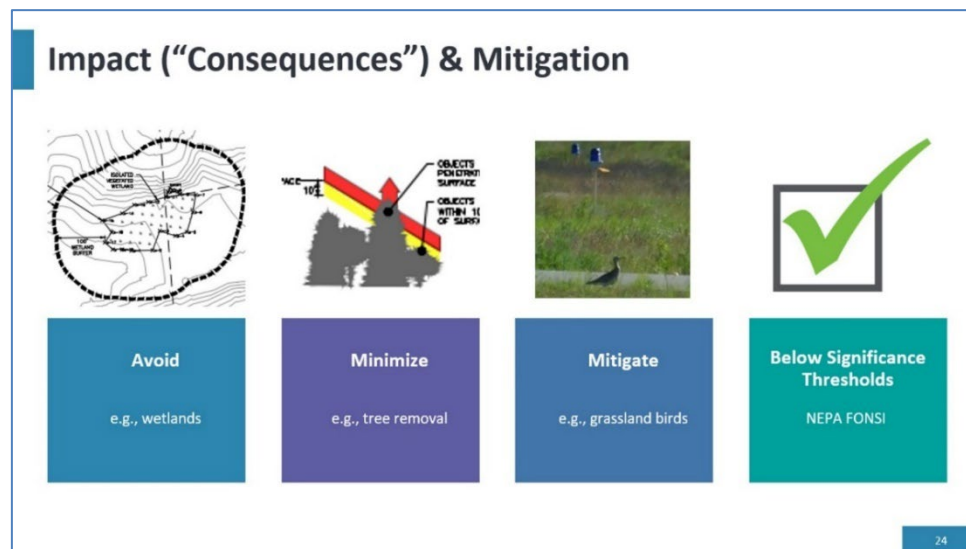


FIGURE 5-8. NEPA Step 4 – Mitigation (Offset Effects / Impacts)

FIGURE 5-9. Public Info Meeting (March 2023) slide illustrating the process of the NEPA review



5.15 Final Determination of NEPA Significance Thresholds

Table 5-7 summarizes NEPA categories that have been carried forward from Chapter 4 and evaluated in Chapter 5 along with the applicable Significance Threshold and demonstration of No Significant Impacts for both the No Action and Proposed Action across the five years analyzed. Following the NEPA process, the table demonstrates that through avoidance, minimization, and mitigation, there are no significant impacts on the natural resources within the 14 categories identified and evaluated and justification for a Finding of No Significant Impacts by the Proposed Action (**Figure 5-10**).

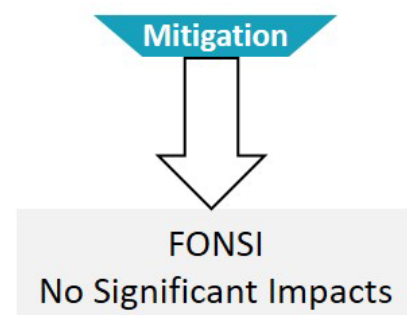


FIGURE 5-10 NEPA Step 5 – FONSI

TABLE 5-7. Significance Thresholds (FAA Order 1050.1F, Exhibit 4-1) and Impact Determination by Year

Environmental Impact Category	Significance Threshold	Significant Impact – Y/N?				
		2022 TMPU	2023	2024	2025	2026
Air Quality	The action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the EPA under the Clean Air Act, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.	N/A	No	No	No	No
Biological Resources	The USFWS and NMFS determines that the action would be likely to jeopardize the continued existence of a federally-listed threatened or endangered species, or would result in the destruction or adverse modification of federally designated critical habitat. The FAA has not established a significance threshold for non-listed species. Other factors in considering whether an action would impact biological resources are discussed in Section 5.5.	N/A	No	No	No	No
Climate Change	The FAA has not established a significance threshold for this category. Factors considered in determining whether or not an action would have impacts are discussed in Section 5.6.	N/A	No	No	No	No
Haz Materials, Solid Waste, and Pollution Prevention	The FAA has not established a significance threshold for this category. Factors considered in determining whether or not an action would have impacts are discussed in Section 5.7.	N/A	No	No	No	No
Land Use	The FAA has not established a significance threshold for this category. The determination of whether or not significant impacts exist in this category is normally dependent on the significance of other impacts (see Section 5.8).	N/A	No	No	No	No
Natural Resources & Energy Supply*	The FAA has not established a significance threshold for this category. Factors considered in determining whether or not an action would have impacts are discussed in Section 5.9.	N/A	No	No	No	No
Noise and Noise-Compatible Land Use	The action would increase noise by Day-Night Average Sound Level (DNL) 1.5 dB or more for a noise-sensitive area that is exposed to noise at or above DNL 65 dB, or that will be exposed at or above DNL 65 dB level due to a DNL 1.5 dB or greater increase when compared to the No Action Alternative for the same timeframe (e.g., an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 to 65 dB). See Section 5.10.	N/A	No	No	No	No
Socioeconomics, Environmental Justice, Children's Environmental Health & Safety	The FAA has not established a significance threshold for this category. Factors considered in determining whether or not an action would have impacts is discussed in Section 5.11.	N/A	No	No	No	No

Environmental Impact Category	Significance Threshold	Significant Impact – Y/N?				
		2022 TMPU	2023	2024	2025	2026
Water Resources [in order to match 1050.1F, Exhibit 4-1 and narrative] – Wetlands, Surface Waters [no impact on floodplains and floodways; no impacts on groundwater; resources not affected]	Wetlands – The action would: 1. Adversely affect a wetland’s function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers; 2. Substantially alter the hydrology needed to sustain the affected wetland system’s values and functions or those of a wetland to which it is connect; 3. Substantially reduce the affected wetland’s ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public); 4. Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands; 5. Promote development of secondary activities or services that would cause the circumstances listed above to occur; or 6. Be inconsistent with applicable state wetland strategies. Factors to consider whether or not an action would impact groundwater, surface water, and wetlands are discussed in Section 5.12. Surface Waters – The action would: 1. Exceed water quality standards established by Federal, state, local, and tribal agencies; or 2. Contaminate public drinking water supply such that public health may be adversely affected.	N/A	No	No	No	No
		N/A	No	No	No	No
Cumulative Effects	Factors considered in determining whether an action would result in cumulative impacts are discussed in Section 5.14.	N/A	No	No	No	No
SOURCE: FAA Order 1050.1F, Exhibit 4-1 (September 2023) *NOTE: “Natural Resources” in this NEPA-defined context refers to materials/aggregate to provide base fill for the runway and taxiway improvements.						

5.16 Summary of Required Actions and Permits*

A summary of the federal and state actions and permits is listed below **Table 5-8**. There are no local permits or approvals needed for the Proposed Action, since no wetlands impacts are proposed. The applicable statutory and regulatory standards are referenced. Existing aviation easements are identified. There are no additional aviation easements as part of the Proposed Action.

TABLE 5-8 State, Federal, and Local Permitting

Agency	Action or Permit	Statutory Reference / Regulatory Standard
Federal		
Federal Aviation Administration (FAA)	Federal Decision	NEPA
Massachusetts Department of Environmental Protection (DEP)	Water Quality Certificate (state administered)	Section 401
US Environmental Protection Agency (EPA)	Construction General Permit	National Pollutant Discharge Elimination System (NPDES)
Massachusetts Historical Commission (MHC)	Section 106 clearance	Section 106 National Historic Preservation Act
State		
Executive Office of Energy and Environmental Affairs	Section 61 Findings	MEPA
Massachusetts DEP	Water Quality Certificate	Section 401
MassWildlife's Natural Heritage & Endangered Species Program (NHESP)	Amendment to Conservation and Management Permit (CMP)	Massachusetts Endangered Species Act (MGL Chapter 131A) and Regulations (321 CMR 10.00)
Local		
[NONE]		
*Additional permitting may be needed for future work under the TMPU. For work beyond the 5-year CIP, there may be a need to complete one or more Notice of Project Change (NPC) filings under MEPA. The ALP projects 20 years into the future and has many variables that will evolve and are difficult to predict in that timeframe.		

TABLE 5-9 Proposed 5-Year Capital Improvement Plan (2023-2027) – Financial Assistance

Planning Period (Federal Fiscal Year)	Project	Estimated Project Cost	Estimated FAA Funding	Estimated MassDOT Match	Estimated Local Match
2024/2025	Runway 6/24 & TW E Extension Environmental Assessment	\$350,000	\$315,000	\$17,500	\$17,500
2025	Design and Permit RW 6 Extension/TWE	\$480,000	\$432,000	\$24,000	\$24,000
2026	Water/Waste- water Upgrades Sewer Main	\$700,000	\$0	\$560,000	\$140,000
2026	Extend RW 6/24 (351' x 75')	\$4,600,000	\$4,140,000	\$230,000	\$230,000
2026	Extend TW E/A (700'x35')	\$3,000,000	\$2,700,000	\$150,000	\$150,000
2026	Gate 3 Taxi Lane Reconstruction	\$525,000	\$472,500	\$26,250	\$26,250
2027	Reconstruct RW 6/24	\$5,700,000	\$5,130,000	\$285,000	\$285,000
2027+	Emergency Generator Airside Infrastructure	\$275,000	\$247,500	\$13,750	\$13,750
5-Year ACIP Total		\$15,630,000	\$13,437,000	\$1,289,000	\$886,500

6 Consultation and Coordination

This section summarizes consultations that occurred with the resource agencies during the development of this EA, as well as the public involvement and outreach efforts. **Appendix E** includes the compiled agency/public comments on the Draft EA and responses. Meeting materials from the EA/EIR meetings are included in **Appendix C**.

6.1 Agency Coordination and Communications

Agency	Contact	Activity/Event	Location	Description/Comments
MEPA	Carline Lemoine, Page Czepiga	MEPA EJ and Pre-Application Consultation Session	Via remote online video conference	Introduction of Project to MEPA agency staff
		ENF Submitted	Via MEPA portal	Copies provided digitally to required parties and hard copies circulated to three libraries (See Final EA Section 6.2)
		ENF notice in Environmental Monitor	Via MEPA portal	20-day public comment period commences
		MEPA Scoping Session	Remote Online Video Conference	Public permitted to attend meeting with primary focus on identifying scope / information to include in Draft EIR
	Nicholas Moreno	MEPA DEIR/FEIR	Via email and phone	Communications
EPA Region 1	Kira Jacobs	Emails re: EPA Sole Source Aquifer oversight	Via emails	Confirmation of SSA and EA/EIR Review
MassDEP	Jonathan Hobill	Comments on ENF	Attached to MEPA ENF Certificate	Included comments from multiple MassDEP Bureaus: BAW, Air and Waste BWR, Water Resources BWSC, Waste Site Cleanup
Mass Division of Marine Fisheries	Emma Gallagher	Email	Email	Confirming no marine resources associated with project
		MESA and	Emails and	Consultation regarding

Agency	Contact	Activity/Event	Location	Description/Comments
Mass NHESP	Amy Hoenig	CMP Preliminary Consultation; Coordination and Initial Meeting	MassDFW HQ, Westborough	existing Conservation Management Permit(s) under MESA, Grassland Management Plan, and Mitigation for Proposed Action impacts
Mass Historical Commission/SHPO	Edward Bell	Notification Letter/MEPA ENF, Response request letter	Phone calls (x2) and email; Letter from MHC	No comments were received from the MHC during the 30-day review period under CMR 950 71.04
Tribal Historic Preservation Officers <ul style="list-style-type: none"> • Mashpee Wampanoag Tribe • Wampanoag Tribe of Gay Head (Aquinnah) 	<ul style="list-style-type: none"> • David Weeden • Bettina Washington 	Government-to-Government Consultation Invitation	Letters from FAA to Tribes	Section 106 Consultation under National Historic Preservation Act, Federal Executive Order 13175
USFWS	Maria Tur	Phone consultation	Via phone	Confirmation of no need for formal consultation

6.2 NEPA Circulation

The Final EA has been circulated to the following parties:

Federal Agencies

Federal Aviation Administration
New England Region, Airports Division
1200 District Avenue
Burlington, MA 01803-5078

Environmental Protection Agency
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State and Regional Agencies

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Aeronautics Division
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Carver Board of Health
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Jill Martins, BOH Clerk
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Manomet Branch
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plmlib@ocln.org

Carver Public Library
2 Meadowbrook Way
Carver, MA 02330
cjulius@carverpl.org

6.3 Public Outreach

Date	Event	Location	Description/ Comments
January, April, June 2022	3 Master Plan Meetings	Plymouth Airport	Conducted as part of public outreach and engagement efforts throughout the development of the Airport's Technical Master Plan Update (TMPU) and Airport Layout Plan (ALP) prior to commencing EA
March 17, 2023	MEPA Screening Form Distribution		>200 parties emailed, including all public agencies and organizations on MEPA requisite EJ distribution list, members of EJ community, and Airport email list from previous meetings and Airport activities
March 29, 2023	Public Outreach Session	Plymouth Airport	
May 10, 2023	MEPA Scoping Session	Remote Online Video Conference	Public permitted to attend meeting with primary focus on identifying scope / information to include in Draft EIR
October 25, 2023	NEPA Draft (EA) approved for public release and notice to Federal Register		30-45 day agency review period under NEPA
November 8, 2023	MEPA Draft (EIR) released on Environmental Monitor for public review and comment		Following release on Environmental Monitor, the public has 30 days to comment. The MEPA office has 37 days to make a determination on DEIR.
November 2023	Draft EA/EIR Public Meeting	Plymouth Airport	Public Meeting held after release of Draft EA/EIR on Environmental Monitor website
December 2024	Final EIR Public Meeting	Plymouth Airport	Public meeting held after release of Final EIR on Environmental Monitor website

7 List of Preparers

In accordance with FAA 1050.1F 6-2.1g and CEQ regs 1502.18, this List of Preparers identifies each person who has prepared a section of the EA or a substantial background paper used in preparing the EA and that person's respective employer, along with the FAA lead personnel.

NAME/TITLE	YRS EXP.	CERTIFICATION/ EDUCATION	ROLE/AREA OF RESPONSIBILITY
FEDERAL AVIATION ADMINISTRATION – FEDERAL PROJECT SPONSOR			
Cheryl Quaine Environmental Protection Specialist	26	MS, Environmental Science Christopher Newport University	FAA Project Manager, General Consultation, Document Oversight and Review
Colleen Mailloux, AICP Community Planner	20	MS Resource Economics University of Maine	FAA Community Planner, QA/QC
DUBOIS & KING			
Brenda Bhatti Sr. Environmental Planner/ Wildlife Biologist	25	MS, Environmental Studies Antioch University New England	EA/EIR Project Manager, Lead EA/EIR Author, MEPA ENF QA/QC, Agency Collaboration, Public Outreach
Jeff Adler Senior Civil Engineer	41	MS, Civil Engineering University of Maine – Orono	CIP Project Manager
Jennifer Ricciardi Senior Aviation Planner	23	Sr. Aviation Planner	Quality Assurance, TMPU/ALP Manager and Verification
Guy Rouelle, Director Aviation Division	36	MAS Airport Operations Embry-Riddle Aeronautical Univ.	EA Document Peer Review, Public Outreach
Mark Goodrich, PE Sr. Project Manager	27	BS, Civil Engineering University of New Hampshire	Sr. Aviation Engineer
Brian Pinsonault Aviation Planner	11	BA, Multidisciplinary Studies Castleton State College	AEDT Noise Modeling
Andrew Lewis Civil Engineering Technician	2	AS, Civil Engineering Technology Eastern Maine Community College	CADD/GIS Mapping
EPSILON ASSOCIATES, INC.			
Alyssa Jacobs	20+	MS, Environmental Science	MEPA ENF / Final EIR Lead; EIR QA/QC; NHESP Coordination
Nathan Rawding	16+	MS, Environmental Planning and Policy	MEPA ENF Primary Author, EA/EIR Coordination, QA/QC
Hiromi Hashimoto	5	MS, Environmental Planning and Policy	MEPA ENF Preparation
Rob Sheldon	12+	MS, Geographic Information Science	GIS Mapping/Figures