

# 7. Implementation Plan & Financial Feasibility Analysis

The preceding chapters have identified the projects necessary for the Delaware Coastal Airport (GED or the Airport) to accommodate the forecast level of demand throughout a 20-year planning period, as well as meet Federal Aviation Administration (FAA) standards.

This chapter provides guidance relevant to the implementation of airport development and Airport Master Plan objectives by presenting a realistic Capital Improvement Program (CIP) and order-of-magnitude unit-based cost estimates for each project. The proposed development actions detailed in this chapter are derived from the Preferred Airport Development Alternative presented in Chapter 6, *Alternatives Analysis* as well as through the airport’s existing CIP. The project phasing plan prescribes a plausible phasing schedule for implementing the proposed improvements over the twenty-year planning period. Finally, a comprehensive examination of the Airport Layout Plan (ALP) set which incorporates all the recommended improvements is included.

## 7.1. THE IMPLEMENTATION PROCESS

In general, each project implemented by the Airport must follow specific steps to be properly realized. For complex projects requiring federal discretionary funding, such as major airfield modifications, these steps may take up to five years before issuing an Airport Improvement Program (AIP) or Bipartisan Infrastructure Law (BIL) grant for construction. Less complex projects using entitlements such as pavement rehabilitation will require less lead time, typically no less than two to three years prior to grant issuance. This long lead time is needed to ensure that funding, environmental documentation, design, and construction are properly coordinated. Common steps in project implementation include:

**Professional Services:** Select a qualified consultant for the project planning, survey, design, construction administration, and/or environmental reviews for the project.

**Five Years Prior to Construction:** Update the CIP to identify the project scope, eligibility, justification, and funding. Close coordination with the FAA is required.

**Four Years Prior to Construction:** Assure the project is identified on the ALP, complete necessary airport planning studies, and collect supporting documentation to demonstrate the project is justified for AIP and/or BIL funding and is compatible with the ALP.

**Three Years Prior to Construction:** Initiate any aeronautical surveys, navigational aid agreements (reimbursable agreements), or special FAA coordination for flight procedures that may be necessary prior to construction. Solidify project funding plan and final justification with FAA.

**Two Years Prior to Construction:** Complete required National Environmental Policy Act (NEPA)

documentation and analysis for the proposed action. Prepare 30 percent project design plans, refine cost estimates, and prepare benefit/cost analysis, as necessary. Acquire land for the project and initiate airspace studies.

**One Year Prior to Construction:** Obtain environmental clearance and permits for the proposed action. Prepare detailed project plans and specifications including design reports, airspace studies, and construction safety/phasing plans. Finalize the project schedule.

**Year of Construction:** Complete the final design. Solicit bid proposals from companies engaged in project construction. Prepare a grant application and accept the federal grant. Issue notice to proceed and monitor construction. Maintain FAA grant compliance and payments.

**After Construction:** Obtain FAA approval, submit the final report, and close out the AIP grant.

## 7.2. PROJECT PHASING AND COST ESTIMATION

This section of the Airport Master Plan seeks to establish a tentative schedule for the various projects required to fulfill the future development goals as expressed in previous chapters and depicted on the ALP documents. This year-by-year implementation plan provides guidance for continued maintenance, upgrade, and expansion of facilities, as consistent with the Airport facility requirements, and long-term strategic vision of the Airport.

The implementation plan documents the schedule of projects and estimation of probable costs across the 20-year development program. These costs are broken down into short-term (0-5 years), intermediate (6-10 years), and long-term (11-20 years) development needs. The implementation plan considers the demand-driven need for facilities based on information developed in this document's Facility Requirements and Alternatives Analysis chapters to provide the Airport and FAA with the information needed to integrate the Airport Master Plan recommendations with their greater funding and implementation schemes.

### 7.2.1. Project Identification

Projects identified in the Airport Master Plan respond to the identified facility and/or user needs and are programmed based on a reasonable expectation of when demand warrants and funding becomes available. The identification of projects is largely determined through recommendations resulting from Airport Master Plan findings, in which the assignments of project priorities, phasing, and estimated costs resulted from consultations with Airport staff. The following sources of project improvements have been reviewed for incorporation into the 20-year Airport Development Plan:

- Existing CIP
- Airport operating and maintenance improvement needs
- Airport Master Plan recommendations

The Airport Development Plan is a 20-year improvement schedule, including both eligible and non-eligible projects allowable under FAA funding programs. This plan focuses on the capital projects necessary to implement the full project recommendations of the Airport Master Plan, as opposed to routine operating and preventative maintenance projects.

### 7.2.2. Project Phasing Periods

Projects are phased to facilitate systematic development over the course of the next 20 years. Projects appearing in the first phase are of greater importance to the Airport and have the least tolerance for delay. Additionally, some projects included in an early phase may be a prerequisite for other planned improvements in a later phase. The development phasing for Delaware Coastal Airport has been divided into three distinct phases as follows:

- Phase I: (1 to 5 years), 2024-2028<sup>1</sup>
- Phase II: (6 to 10 years), 2029-2034
- Phase III: (11 to 20 years), 2035-2045

The phasing of individual projects should undergo periodic review to determine the need for changes based on variations in forecast demand, available funding, economic conditions, and/or other factors that may reasonably influence airport development. Additionally, other projects not foreseen in this report may be identified in the future and may necessitate changes in the phasing of projects and the overall CIP. Further, the projects and overall development identified in the CIP, though tied to a timetable, will only occur once the triggering demand and/or need is realized.

### 7.2.3. Critical Capital Improvement Projects

A list of capital improvement projects has been assembled using the documentation previously presented regarding anticipated facility demands and preliminary engineering analysis focusing on facility and equipment rehabilitation needs. This phasing plan focuses on the substantive facility improvements addressed in this Airport Master Plan Update. As such, typical budgeted airport expenses such as regular maintenance activities, or small pavement rehabilitations have not been included.

**Table 7-1** through **Table 7-3** present this information along with planning level Order of Magnitude cost estimates for each identified project. Based on current 2023 costs, cost estimates for individual projects have been prepared for the improvement projects identified over the planning period. These estimates are intended to be used for planning purposes only and should not be construed as construction cost estimates, which can only be compiled following the preparation of detailed engineering design documents. However, the cost estimates presented in this document allow for an understanding of the plausible cost for each development action and to assist in future decision making. To accompany **Table 7-1** through **Table 7-3**, **Figure 7-1** through **Figure 7-3** graphically illustrate each project by phase.

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<sup>1</sup> For the purposes of capital development, all years referenced in this document are federal fiscal years as opposed to calendar years.

Table 7-1: Project Phasing and Cost Estimates Phase I (2024-2028)

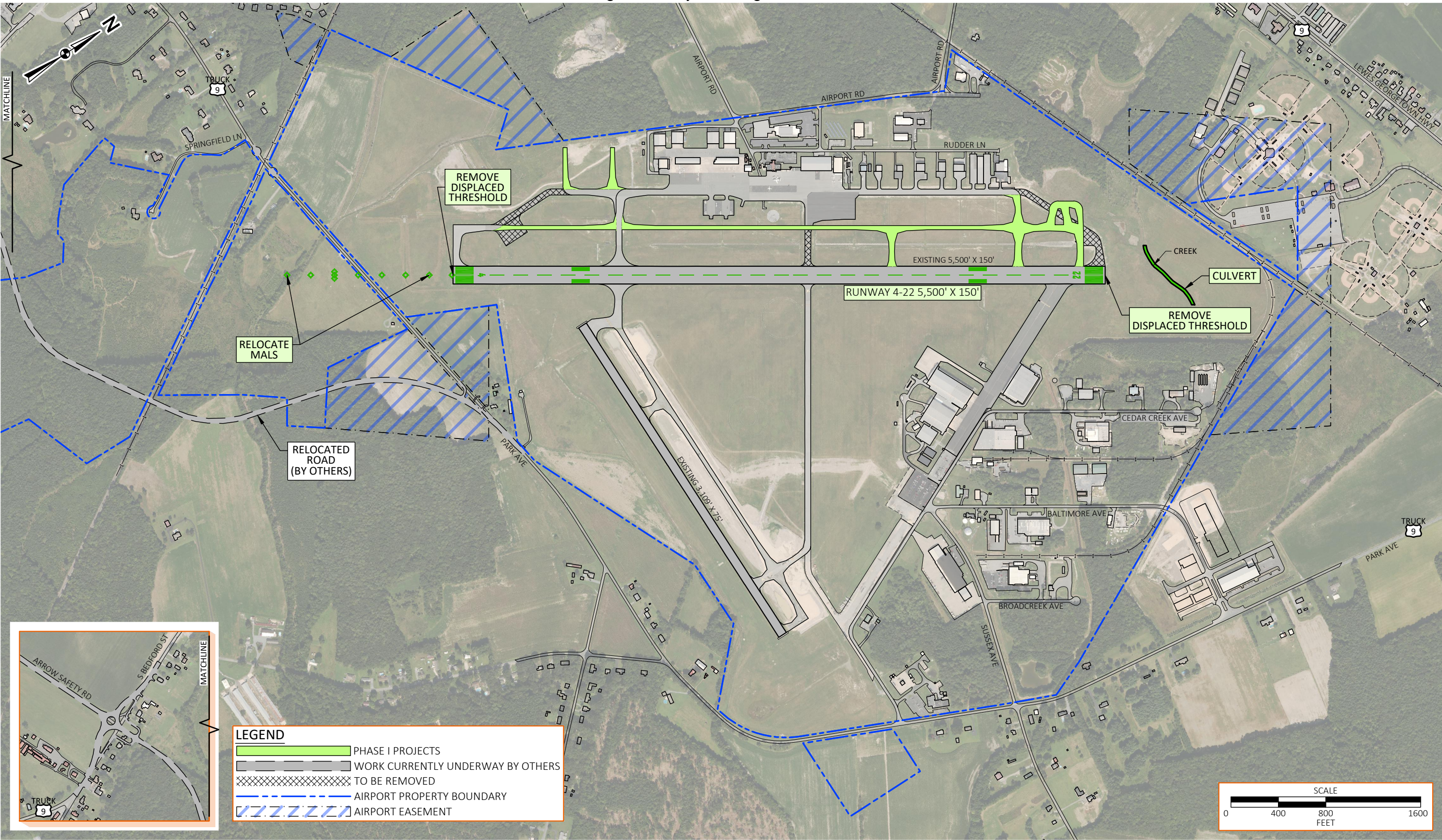
Description	Year	Project Cost
Construct Parallel Taxiway B (TW H to north end of GA Apron Expansion) - Phase I (Design)	2024	\$500,000
Improve Runway 22 RSA – Culvert Creek & Remove Displaced Thresholds - Phase I (Design & Environmental Assessment)	2024	\$270,000
Construct Parallel Taxiway B - Phase II (Construct)	2024	\$3,000,000 <sup>2</sup>
Improve Runway 22 RSA – Culvert Creek & Remove Displaced Thresholds – Phase II (Construct)	2025	\$1,590,000
Relocate MALS	2025	\$1,900,000
Rehabilitate Terminal Apron - Phase I (Design)	2025	\$350,000
Construct Hangar Taxiways Phase I (Design)	2025	\$330,000 <sup>2</sup>
Construct Parallel Taxiway B - Phase III (Construct)	2025	\$3,100,000 <sup>2</sup>
Rehabilitate Terminal Apron - Phase II (Construct)	2026	\$2,461,112
Construct Hangar Taxiways Phase II (Construct)	2026	\$1,350,000 <sup>2</sup>
Construct Parallel Taxiway B - Phase IV (Design)	2026	\$600,000 <sup>2</sup>
Construct Parallel Taxiway B - Phase V (Construct)	2027	\$3,300,000 <sup>2</sup>
Construct Parallel Taxiway B - Phase VI (Construct)	2028	\$3,400,000 <sup>2</sup>
<b>Total Phase I</b>		<b>\$22,151,112</b>

Source: McFarland Johnson analysis, 2023.

<sup>2</sup> Costs derived from Sussex County Capital Improvement Plan



Figure 7-1: Project Phasing Plan - Phase I

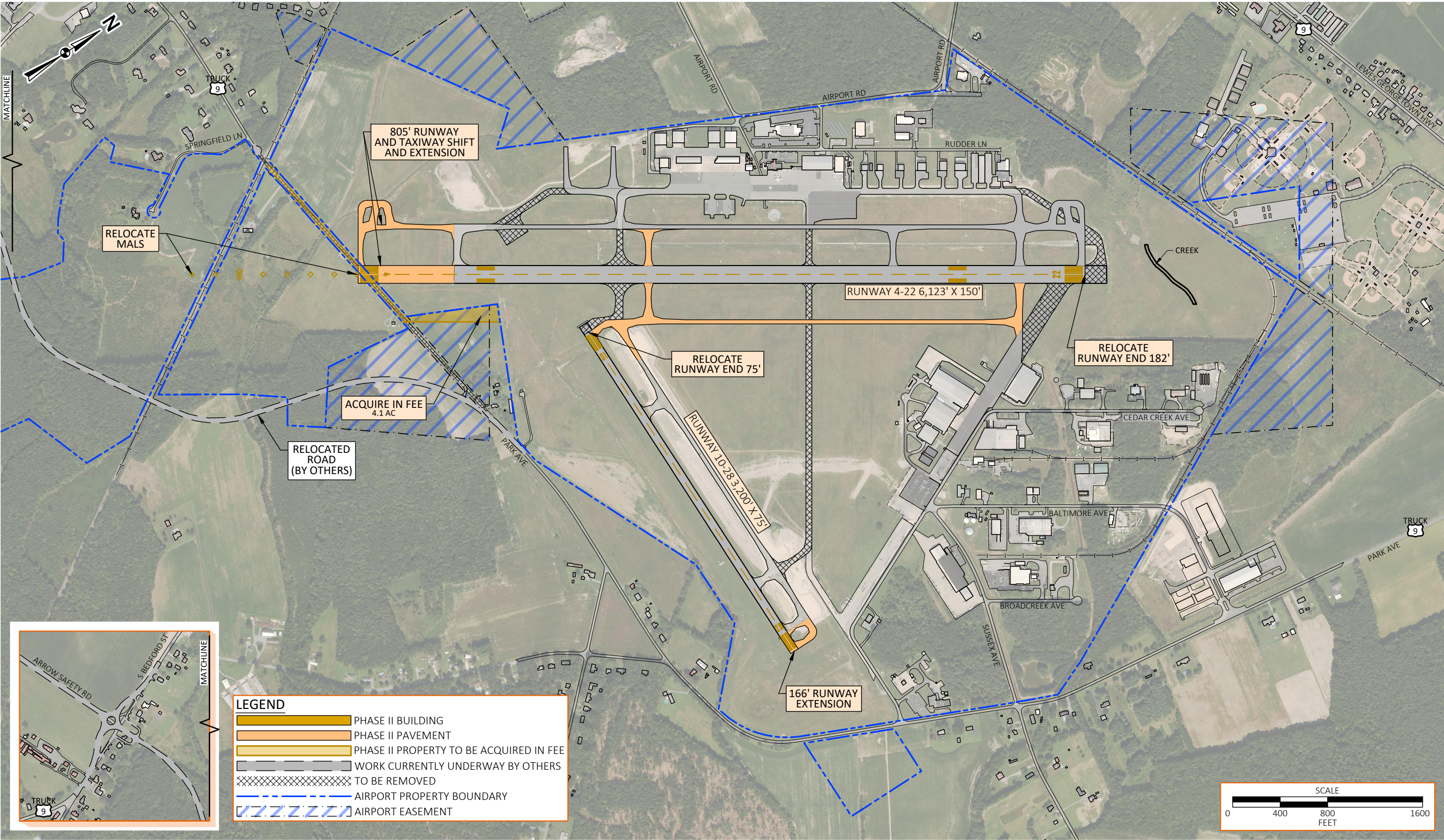




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Figure 7-2: Project Phasing Plan - Phase II

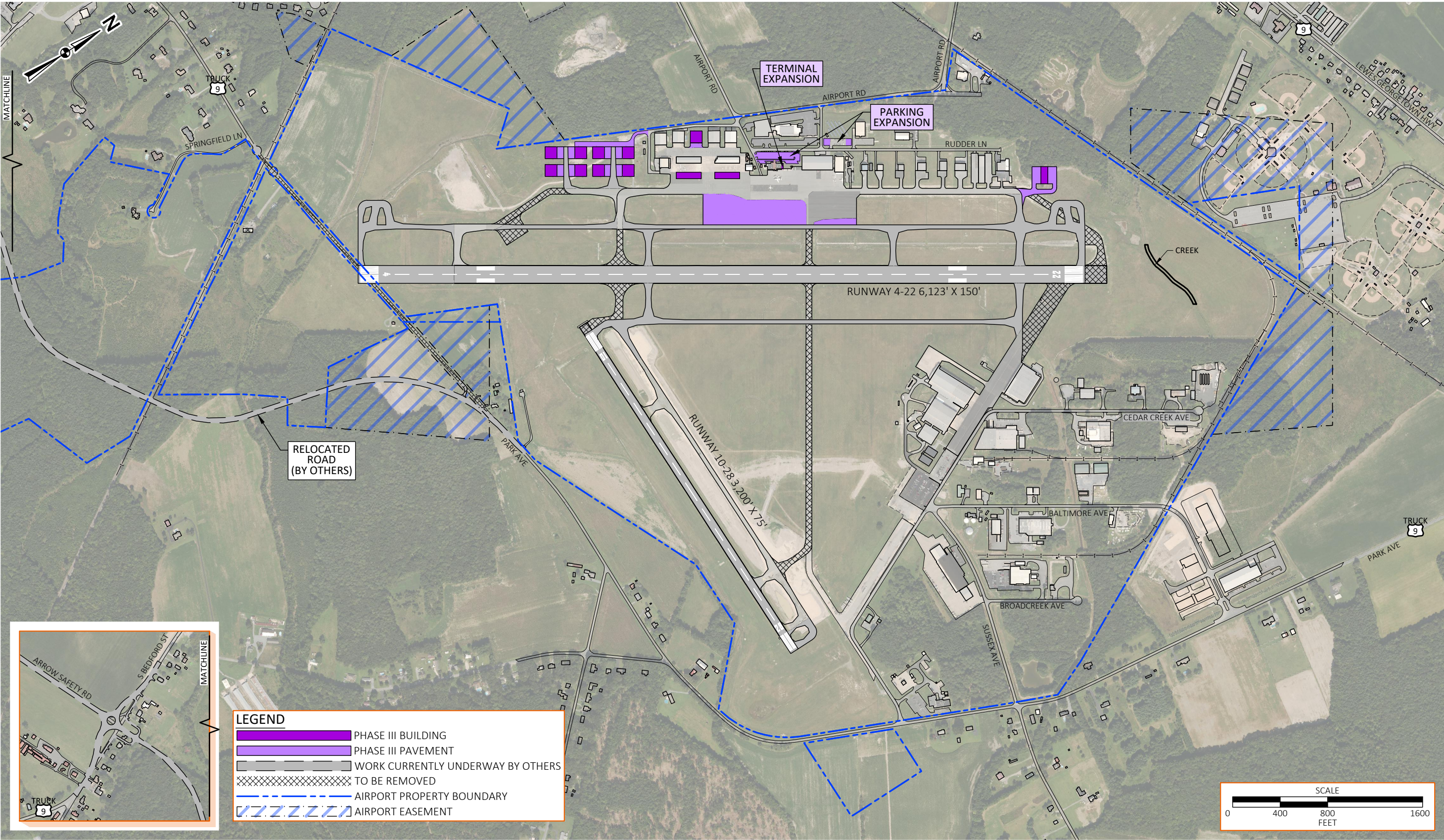




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Figure 7-3: Project Phasing Plan - Phase III





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Table 7-2: Project Phasing and Cost Estimates Phase II (2029-2034)

Description	Year	Project Cost
Runway 4 Extension (805' by 150') + Taxiway A Extension + Runway 22 End Reconfiguration Phase I and Land Acquisition (Park Avenue and ROFA) (EA and Preliminary Design)	2029	\$1,100,000 <sup>3</sup>
Runway 4 Extension (805' by 150') + Taxiway A Extension + Runway 22 End Reconfiguration Phase II (Final Design/Contract Documents)	2030	\$2,750,000
Land Acquisition (Park Avenue and ROFA)	2031	\$500,000
Relocate MALS	2031	\$2,200,000
Runway 4 Extension (805' by 150') + Taxiway A Extension + Runway 22 End Reconfiguration - Phase III (Construct)	2032	\$21,000,000 <sup>3</sup>
Runway 28 Extension + Runway 10 Shift + Taxiway Connector Reconfigurations – Phase I (EA)	2033	\$200,000
Runway 28 Extension + Runway 10 Shift + Taxiway Connector Reconfigurations – Phase I (Design)	2034	\$200,000
Taxiway B North (Partial Parallel Runway 4-22) - Phase I (Design)	2034	\$2,120,000
Runway 28 Extension + Runway 10 Shift + Taxiway Connector Reconfigurations – Phase II (Construct)	2034	\$1,739,600
Taxiway B North (Partial Parallel Runway 4-22) - Phase III (Construct)	2034	\$8,460,000
Taxiway B South + Taxiway D Demo + New TAXIWAY A1 - Phase I (EA)	2034	\$200,000
Taxiway B South + Taxiway D Demo + New TAXIWAY A1 - Phase I (Design)	2034	\$1,360,000
Taxiway B South + Taxiway D Demo + New Taxiway A1 - Phase I (Construct)	2034	\$5,430,000
<b>Total Phase II</b>		<b>\$46,979,600</b>

Source: McFarland Johnson analysis, 2023.

<sup>3</sup> Costs derived from Sussex County Capital Improvement Plan



Table 7-3: Project Phasing and Cost Estimates Phase III (2035-2045)

Description	Year	Project Cost
Rehabilitate Runway 4-22 Pavement (5,500'x150') - Phase I (Design)	2035	\$1,700,000 <sup>4</sup>
Rehabilitate Runway 4-22 Pavement (5,500'x150') - Phase II (Construct)	2036	\$20,000,000 <sup>4</sup>
Expand Terminal Apron - Phase I (Design)	2037	\$375,000
Expand Terminal Apron - Phase 2 (Construct)	2038	\$3,300,000
Rehabilitate Terminal Apron – Phase I (Design)	2039	\$452,480
Rehabilitate Terminal Apron – Phase II (Construct)	2040	\$4,235,200
Hangars (One 5-unit T-hangar) - (Design)	2041	\$410,000
Hangars (One 5-unit T-hangar) - (Construct)	2042	\$2,684,400
Hangars (Two 9-unit T-hangars) - Phase I (Design)	2043	\$745,800
Hangars (Two 9-unit T-hangars) - Phase II (Construct)	2044	\$4,933,170
Rehabilitate T-hangar Apron – Phase I (Design)	2044	\$221,590
Rehabilitate T-hangar Apron – Phase II (Construct)	2045	\$2,074,100
Box Hangars (9 total) - Phase I (Design)	2045	\$5,170,000
Box Hangars (9 total) - Phase II (Construct)	2045	\$34,440,000
Vehicle Parking and Terminal Building Expansion - Phase I (Design)	2045	\$320,000
Vehicle Parking and Terminal Building Expansion - Phase I (Construct)	2045	\$1,319,000
<b>Total Phase III</b>		<b>\$82,380,740</b>
<b>Total All Phases</b>		<b>\$153,761,452</b>

Source: McFarland Johnson analysis, 2023.

### 7.3. AIRPORT LAYOUT PLAN DRAWING SET

The ALP drawing set has been prepared in accordance with generally accepted airport planning practices and FAA guidance materials, including the following:

- FAA Advisory Circular 150/5070-6B, *Airport Master Plans*
- FAA Advisory Circular 150/5300-13A, *Airport Design*
- Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*
- FAA Standard Operating Procedures (SOP) ALP Checklist

<sup>4</sup> Costs derived from Sussex County Capital Improvement Plan.

The sheets that require changes for GED for this Airport Master Plan include:

<u>Sheet</u>	<u>Title</u>
1	Cover Sheet
2	Existing Airport Layout
3	Airport Layout Plan
4	Airport Data Tables
5	Terminal Area Plan
6	Airport Airspace Plan
7	Inner Approach Plan Existing Runway 4
8	Inner Approach Plan Existing Runway 22
9	Inner Approach Plan Proposed Runway 4
10	Inner Approach Plan Proposed Runway 22
11	Inner Approach Plan Ultimate Runway 4
12	Inner Approach Plan Ultimate Runway 4 Tables
13	Inner Approach Plan Ultimate Runway 22
14	Inner Approach Plan Existing Runway 10
15	Inner Approach Plan Existing Runway 28
16	Inner Approach Plan Proposed Runway 10
17	Inner Approach Plan Proposed Runway 28
18	Departure Surface Runway 4
19	Departure Surface Runway 22
20	Airport Land Use and RPZ Control Plan
21	Exhibit “A” Airport Property Inventory Map
22	Exhibit “A” Airport Property Inventory Tables
23	Airport Environmental Inventory Map

The full ALP sheet set is bound and presented separately from this chapter.

### 7.3.1. Existing Airport Layout

Sheet 2 – Existing Airport Layout provides the current configuration and existing airport facilities at GED. Details shown include airport buildings, airport infrastructure, local roads and structures, the Airport property lines, and environmental features on or adjacent to the Airport. These details are based on aerial photography and photogrammetric mapping obtained as part of this study effort.

This sheet also serves as a base upon which development proposed within this Airport Master Plan is placed. The current dimensions of the airside and landside facilities are depicted within the sheet, as well as the dimensions of applicable FAA safety and object free areas, protection zones, and other dimensions relevant to airport design. The sheet also includes a facilities table and a title and revision block, as required.



### 7.3.2. Airport Layout Plan

Sheet 3 – Airport Layout Plan (ALP) illustrates the recommended proposed development at the Airport over the twenty-year planning period and possibly beyond, depending on demand. The ALP sheet is the culmination of the Airport Master Plan processes and is the most important sheet in the ALP Drawing Set. The ALP is a legal document used by FAA to allocate federal and state grant funding for projects depicted. The document is approved by FAA and Sussex County.

The projects depicted on the ALP are intended to cover a twenty-year period and are phased over this period based on the sponsor's priority and forecasted demand.

### 7.3.3. Airport Data Tables

Sheet 4 – Airport Data Tables include relevant information that could not fit on the ALP sheet. It is presented in a separate sheet for clarity.

### 7.3.4. Terminal Area Plan

Sheet 5 – Terminal Area Plan depicts the changes proposed within the terminal area. The Terminal Area Plan is shown at a scale to clearly illustrate all of the changes that have been proposed within the vicinity. The Terminal Area Plan depicts the proposed terminal area development at a scale of 1" = 150', as opposed to the scale of the ALP at 1" = 400'.

### 7.3.5. Airport Airspace Plan

Sheet 6 – Airport Airspace Plan shows an overhead view of the Airport and obstructions to the Part 77 horizontal and conical surfaces.

### 7.3.6. Inner Approach Plan Existing Runway 4

Sheet 7 – Inner Approach Plan Existing Runway 4 depicts identified obstacles along the approach ends and lateral edges of Runway 4. It shows a plan and profile view and depicts obstacles that penetrate or are within 10 feet of penetrating the CFR Part 77 primary, approach, and transitional surfaces, the airport design approach surface (ADAS) #4, The Vertical Guidance Surface (VGS), the precision obstacle approach path indicator (PAPI) obstacle clearance surface (OCS), and the PAPI light signal clearance surface (LSCS).

### 7.3.7. Inner Approach Plan Existing Runway 22

Sheet 8 – Inner Approach Plan Existing Runway 22 depicts the CFR Part 77 primary, approach, and transitional surfaces, the existing ADAS #4, the VGS, the PAPI OCS, and PAPI LSCS for Runway 22. Obstructions are shown as they exist today that penetrate or are within 10 feet of penetrating these surfaces. Each obstruction is labeled and numbered and their height above ground as well as the height of the penetration to these surfaces is included in tables on the sheet.

### 7.3.8. Inner Approach Plan Proposed Runway 4

Sheet 9 – Inner Approach Plan Proposed Runway 4 depicts identified obstacles along the proposed Runway 4. It shows plan and profile views that depict obstacles that penetrate or are within 10 feet of penetrating the proposed CFR Part 77 primary, approach, and transitional surfaces, the proposed ADAS #4 and VGS for Runway 4, the proposed PAPI OCS for Runway 4, and the proposed PAPI LSCS for Runway 4.

### 7.3.9. Inner Approach Plan Proposed Runway 22

Sheet 10 – Inner Approach Plan Proposed Runway 22 the CRF Part 77 primary, approach, and transitional surfaces, ADAS #4, the VGS, the PAPI OCS, and the PAPI LSCS for the approach end of Runway 22. It shows the plan and profile views of the runway end environment with identified obstacles that penetrate or are within 10 feet of penetrating these surfaces.

### 7.3.10. Inner Approach Plan Ultimate Runway 4

Sheet 11 – Inner Approach Plan Ultimate Runway 4 depicts the ultimate CFR Part 77 primary, approach, and transitional surfaces, ADAS #4, the VGS, the PAPI OCS, and the PAPI LSCS for Runway 4. It shows a plan and profile view of the approach end of Runway 4, including identified obstacles that penetrate or are within 10 feet of penetrating these surfaces.

### 7.3.11. Inner Approach Plan Ultimate Runway 4 Tables

Sheet 12 – Inner Approach Plan Ultimate Runway 4 Tables include tables of identified obstacles associated with the approach end of Runway 4.

### 7.3.12. Inner Approach Plan Ultimate Runway 22

Sheet 13 – Inner Approach Plan Ultimate Runway 22 shows a plan and profile view of the ultimate approach end of Runway 22. It includes obstacles that penetrate or are within 10 feet of penetrating the ultimate CFR Part 77 primary, approach, and transitional surfaces, the ADAS #4, the VGS, the PAPI OCS, and the PAPI LSCS for Runway 22.

### 7.3.13. Inner Approach Plan Existing Runway 10

Sheet 14 – Inner Approach Plan Existing Runway 10 depicts a plan and profile view of the approach end of Runway 10 and shows obstacles that penetrate or are within 10 feet of penetrating the existing Runway 10 CFR part 77 transitional surface and the Runway 10 PAPI LSCS. The CFR part 77 primary, approach, ADAS #2, and PAPI OCS are also depicted but were found to have no obstacle penetrations or any within 10 feet of penetrating these surfaces.

### 7.3.14. Inner Approach Plan Existing Runway 28

Sheet 15 – Inner Approach Plan Existing Runway 28 depicts a plan and profile view of the approach end of Runway 28. It shows obstacles that penetrate or are within 10 feet of penetrating the Runway 28 CFR part 77 transitional surface, PAPI OCS, and PAPI LSCS. Also



shown are the CFR Part 77 primary, approach, and ADAS #2 surfaces, with no obstacle penetrations or within 10 feet of penetrating these surfaces.

#### 7.3.15. Inner Approach Plan Proposed Runway 10

Sheet 16 – Inner Approach Plan Proposed Runway 10 shows the proposed plan and profile view of the approach end of Runway 10. It includes obstacles that penetrate or are within 10 feet of penetrating the proposed Runway 10 CFR Part 77 approach and transitional surfaces, the proposed VGS, and the proposed PAPI LSCS for Runway 10. Also shown are surfaces with no obstructions or within 10 feet of penetrating, including the CFR Part 77 primary surface, ADAS #4, and the PAPI OCS.

#### 7.3.16. Inner Approach Plan Proposed Runway 28

Sheet 17 – Inner Approach Plan Proposed Runway 28 depicts the proposed plan and profile view of the approach end of Runway 28. It includes obstacles that penetrate or are within 10 feet of penetrating the proposed Runway 28 CFR Part 77 approach and transitional surfaces, the proposed VGS, the proposed PAPI OCS, and the proposed PAPI LSCS for Runway 28. Also shown are surfaces with no obstructions or within 10 feet of penetrating, including the CFR Part 77 primary surface and ADAS #4.

#### 7.3.17. Departure Surface Runway 4

Sheet 18 – Departure Surface Runway 4 shows a plan and profile view of the departure end of Runway 4, including the existing, proposed, and ultimate departure surface. It shows obstacles that penetrate or are within 10 feet of penetrating these surfaces.

#### 7.3.18. Departure Surface Runway 22

Sheet 19 – Departure Surface Runway 22 depicts a plan and profile view of the departure end of Runway 22, including the existing, proposed, and ultimate departure surface for Runway 22. It shows obstacles that penetrate or are within 10 feet of penetrating these surfaces.

#### 7.3.19. Airport Land Use and RPZ Control Plan

Sheet 20 – Airport Land Use and RPZ Control Plan depicts a plan view of the Airport and shows how each abutting parcel to the Airport is zoned. The proposed and ultimate runway protection zones (RPZs) are shown, including land uses within those areas.

#### 7.3.20. Exhibit “A” Airport Property Inventory Map

Sheet 21 – Exhibit “A” Airport Property Inventory Map details the parcels that comprise GED Airport property.

#### 7.3.21. Exhibit “A” Airport Property Inventory Tables

Sheet 22 – Exhibit “A” Airport Property Inventory Tables includes a full inventory of existing and proposed Airport parcels and easements. Details include the tax parcel number, the grantor,

grantee, acreage, how the parcel was purchased, the acquisition date (or owner if unowned), and any relevant notes or the purpose for acquisition in the case of proposed acquisitions.

#### 7.3.22. Airport Environmental Inventory Map

The final drawing in the ALP set details important environmental features on the Airport and in the immediate vicinity.