Lehigh Valley International Airport

Allentown, Pennsylvania

Airport Master Plan Update
Section 7 – Implementation & Phasing Plan

January 2019

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Section 7 – Implementation and Phasing Plan

7.1 Introduction

This section provides recommendations for the orderly and phased development at the Airport through 2040. Section 7.2 includes the description of and cost estimates for the individual capital improvement projects that make up the preferred development plan. The cost estimates were developed assuming 2018 dollars. Section 7.3 summarizes supplemental projects, programs, and initiatives identified throughout the master plan process as being beneficial to the Airport, but are not included on the list of capital improvement projects initially described in Section 6.4.

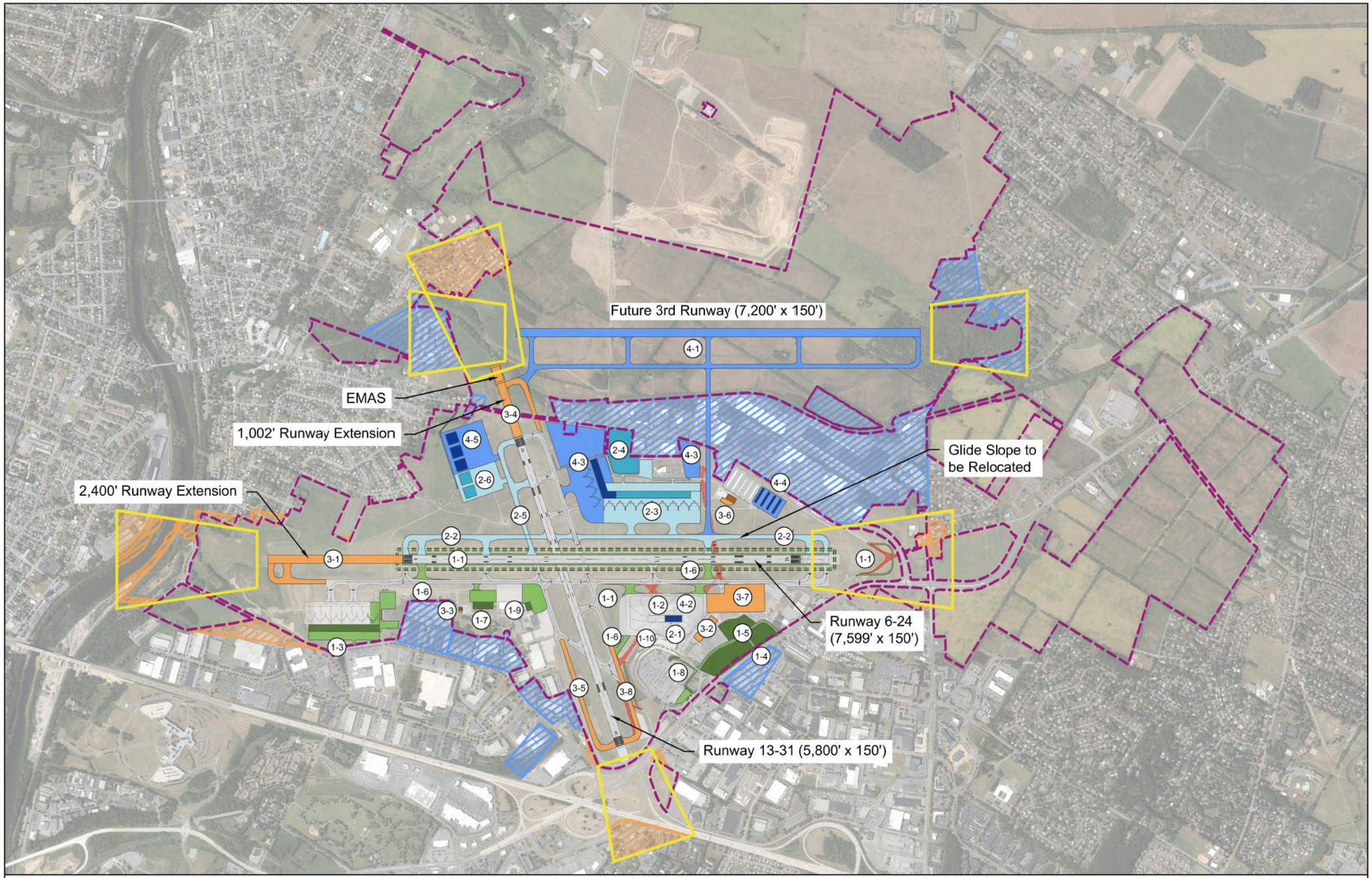
7.2 Capital Improvement Projects

The LNAA's overall capital improvement program includes grant-eligible and major non-eligible projects, operations and safety projects, as well as aviation services, ground handling services, information technology, administration, and parking/passenger services items. This section summarizes the implementation and phasing plan of the capital improvement projects identified through the master plan process. It is based on the proposed development plan developed to meet the requirements associated with the forecasts of aviation demand for the Airport. This plan takes into account anticipated pavement maintenance projects, as well as the capital improvement projects identified for the planning period through 2040. Projects noted for implementation beyond 2040 are shown in Phase 4 for future consideration and land use planning purposes. Cost estimates were not completed for Phase 4 projects.

As the projects were further reviewed and evaluated for cost estimating purposes, changes may have been made regarding different aspects of the project that make them differ from what was shown previously in Figure 6.4.1.

The recommended development plan is shown in **Figure 7.2.1**.

The following sections provide individual project descriptions by phase. The description also identifies the potential environmental requirements for the National Environmental Policy Act (NEPA) based on each project. Depending on the timing and location of some projects, the environmental documentation requirements could and should be combined for the sake of efficiency and avoiding segmented analyses. For the purposes of the master plan, the anticipated environmental requirements are noted for each project individually. Any requirements for coordination or mitigation by the Commonwealth of Pennsylvania would be accounted for as part of the NEPA process.



Phase 1: 0 - 5 Years (2018 - 2023)

1-1 Runway 6-24 Reconstruction & Projects
1-2 Terminal Vertical Circulation Improvements
1-3 Expand Existing Cargo Area
1-4 Landside Circulation Improvements
1-5 Land Use Development (Hotel, Retail, Travel Plaza)
1-6 Taxiway Stub Projects
1-7 Hangar 11 (To Be Constructed in 2018-2019)
1-8 Parking and Ticket Booth Improvements
1-9 FBO Building and Improvements (1) 100x150 FT
1-10 Terminal Security Checkpoint Improvements

Phase 2: 6 - 10 Years (2024 - 2028)

2-1 Terminal IAF Facility
2-2 Northside Parallel Taxiway for Runway 6-24
2-3 New Northside Cargo Facility
2-4 Compatible Development
2-5 Runway 13-31 West Side Parallel Taxiway
2-6 Bulk Hangars (2) 200x200 FT

Phase 3: 11 - 22 Years (2029 - 2040)

3-1 Runway 6-24 Extension (2,400 FT)
3-2 RON
3-3 Fuel Farm Expansion
3-4 Runway 13-31 Extension (1,002 FT)
3-5 Runway 13-31 West Side Parallel Taxiway
3-6 ARFF Building Expansion
3-7 Deice Pad
3-8 Realign Portion of Taxiway B

Phase 4: 23+ Years (2040+)

4-1 3rd Runway and Connecting Taxiways
4-2 Terminal Concourse Extension
4-3 Northside Cargo Expansion
4-4 T-Hangar Rows (4) 12,500 SF Each
4-5 Bulk Hangars (3) 200x200 FT

Legend

- Existing Property Line
- Runway Protection Zone
- Proposed Demolition

Phase 1 (0 - 5 Years)
- Phase 1 Proposed Building
- Phase 1 Proposed Pavement

Phase 2 (6 -10 Years)
- Phase 2 Proposed Building
- Phase 2 Proposed Pavement

Phase 3 (11 - 22 Years)
- Phase 3 Proposed Building
- Phase 3 Proposed Pavement
- Phase 3 Property Acquisition

Phase 4 (23+ Years)
- Phase 4 Proposed Building
- Phase 4 Proposed Pavement
- Phase 4 Property Acquisition

900' 0' 900' 1800'

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Implementation & Phasing Plan

Figure 7.2.1

Phase 1 Projects

The first five years of projects include a variety of projects on the airfield with a number of pavement rehabilitation and maintenance projects, as highlighted in **Figure 7.2.2** and described below. **Table 7.2.1**, provided following Figure 7.2.2, summarizes the Phase 1 Projects with cost estimates.

Project 1-1: Runway 6-24 Rehabilitation and Related Projects ($80 million)

Currently on the Airport's Capital Improvement Program (CIP), the rehabilitation of Runway 6-24 is expected to occur over 4 phases and include the rehabilitation of the runway to meet FAA standards for ADG IV. The project includes drainage, grading RSA improvements, lighting rehabilitation, along with new runway shoulders. This project also includes relocating Taxiway A3 between Taxiway A and the terminal apron. A categorical exclusion (CATEX) was submitted and approved in 2015.

Project 1-2: Terminal Circulation Improvements ($10 million)

The replacement of the elevators and escalators within the satellite terminal are currently on the Airport's CIP and are expected to be complete in 2019. It is assumed that a CATEX would be required, depending on funding.

Project 1-3: Expand Existing Cargo Area ($53.54 million)

To meet short-term demand, this project adds another aircraft parking position to the north/east, a cargo processing building (assumed 160,000 SF) with truck dock/maneuvering space, an employee parking lot, and GSE storage. An environmental assessment (EA) would most likely be required depending upon the final project description and anticipated impacts.

Project 1-4: Landside Circulation Improvements ($1.9 million)

To improve circulation and safety, there will be a number of changes to the internal roadways that connect the terminal to the parking areas, multi-modal center, and proposed land use development projects (Project 1-5). Improvements include relocating the main entrance to the Airport approximately 1,000 feet north of the existing access with a new traffic signal at Airport Road, altering the existing access to allow exiting southbound traffic only, demolishing the parking booths near the bus commuter parking area, and new directional signage. Consideration of parcel access and utility needs associated with adjacent areas during this effort would facilitate development. Coordination with PennDOT will be required in association with creating a new access and signal along Airport Road, which may require special permits and a more detailed traffic analysis. Since operations on Airport Road are expected to be improved because of the project (see Section 6.3), it is assumed a CATEX would be required.

Project 1-5: Land Use Development

This project includes tasks the LNAA is responsible for to prepare the property along Airport Road for non-aeronautical development and secure the private partners to develop the hotel, travel plaza, and retail establishments as identified in the land use analysis (see Appendix H). Project 1-4 needs to be completed prior to this project or developed simultaneously to ensure appropriate access to the Airport and development area. The property is currently zoned Airport Industrial (AI), which permits aviation-related uses but does not appear to allow non-aviation commercial uses by right. As an important near-term action item, the Airport will need to coordinate with Hanover Township to identify measures that can be taken in order to allow non-aeronautical commercial uses on this land. These measures may include

rezoning or the use of a Special Exception process.

The Airport should prepare marketing materials and work with a local real estate broker to promote non-aeronautical commercial development opportunities on this property. If the Airport wishes to accelerate the development of this site, it may issue an RFP and select a preferred developer/user. FAA requires that appraisals be conducted prior to the execution of ground lease agreements, and the site's development will be subject to state and federal environmental review processes.

An EA would most likely be required depending upon the final project description and anticipated impacts. The EA could be conducted by the Authority or be part of the requirements for any developer. Any stormwater requirements will need to be addressed on-site as part of the site plan development.

Project 1-6: Taxiway Stub Projects ($5.12 million)
This project introduces a new taxiway stub near the Runway 6 end to Taxiway A, relocates the southern portion of Taxiway E from the Runway 24 end to Taxiway A, and reconstructs Taxiway G over an existing service road. The existing Taxiway G will become the service road between Taxiway B and the terminal apron. It is assumed that a CATEX would be required.

Project 1-7: Hangar 11 ($16.5 million)
The construction of Hangar 11, east of the current fuel farm, is currently on the Airport's CIP and is expected to be complete in 2019. The 58,000 SF Hangar will be used as an aircraft maintenance and storage building. The project includes the construction of a taxiway stub, concrete apron, vehicle parking lot, and access road. Since the project is currently under construction, the environmental documentation requirements have already been completed.

Project 1-8: Parking and Ticket Booth Improvements ($4.5 million)
The LNAA is currently conducting this project in order to simplify access and relocate utilities associated with the parking booth closer to the terminal. The project includes combining the entrance and exit to the short- and long-term parking lots with new parking booths and providing a larger cell phone waiting lot. While pavement rehabilitation work has begun, it is assumed a CATEX would be required for the remainder of the project.

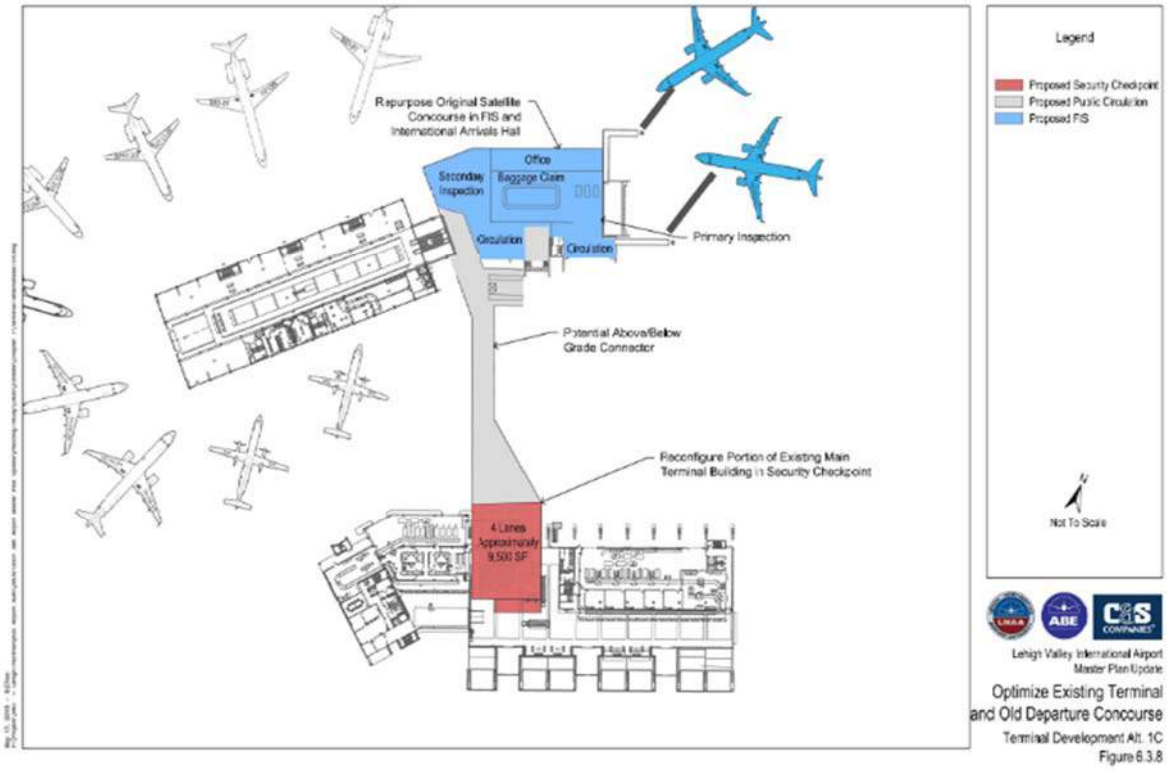
Project 1-9: FBO Building and Improvements ($27.9 million)
This project includes the construction of a new FBO building (approximately 15,000 SF) and the rehabilitation of the existing FBO building including new HVAC systems, rehabilitated restrooms, an outside canopy, etc. It also includes the rehabilitation of the existing apron in front of the current building and new pavement between the existing FBO (Hangar 7) and Hangar 10. A short-form EA would most likely be required depending upon the final project description and anticipated impacts.

Project 1-10: Terminal Security Checkpoint Improvements (Option 1C $10.2 million)
Two options (1C and 2) for improving the terminal security checkpoint were indicated as preferred options based on the alternatives analysis highlighted in Section 6. Since Option 1C optimizes existing facilities, would be less expensive than Option 2, and planning estimates do not indicate the need for the additional capacity generated by Option 2, Option 1C is most likely the preferred option. While the

financial analysis in Section 8 assumes the less expensive Option 1C, both are noted here due to their desirability if funding was not a concern.

Option 1C – This project focuses on the optimization of the existing terminal and satellite connector to improve the security checkpoint. It includes the relocation of the checkpoint to the departure level of the terminal, a building expansion, an enclosed at-grade connector to the satellite terminal, and replacement of the vertical circulation infrastructure to allow arriving passengers to access the connector. It is assumed that a CATEX would be required.

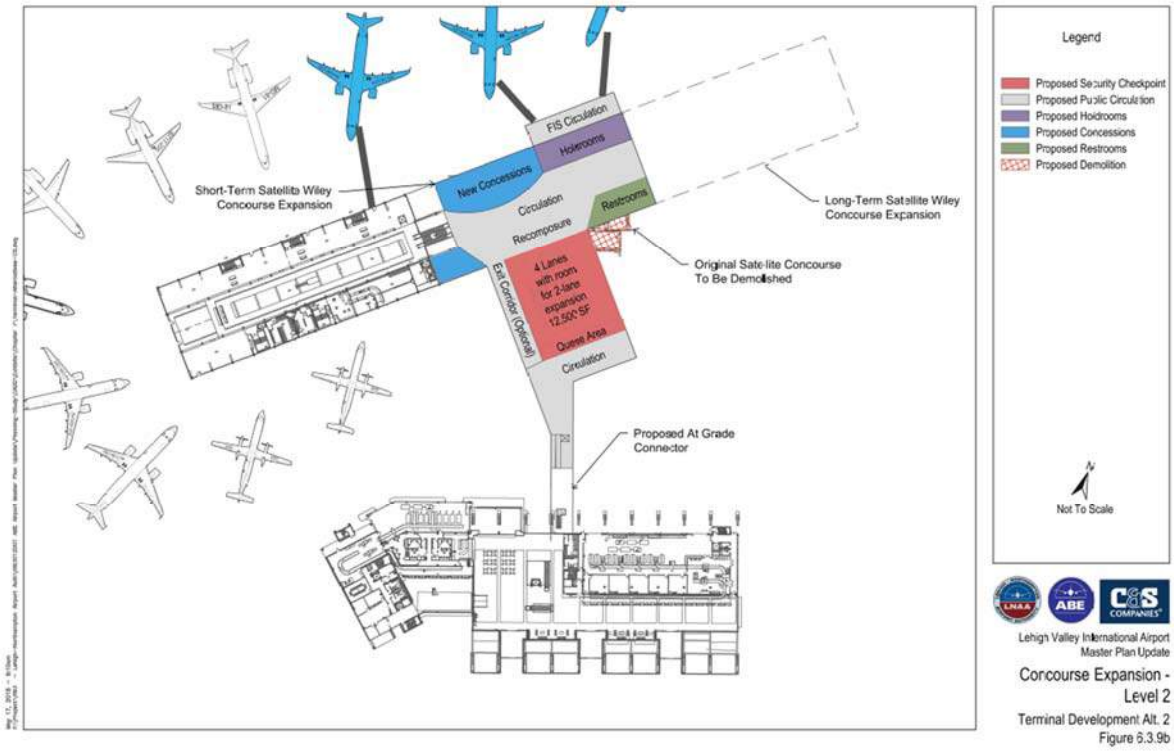
Snapshot of Terminal Circulation Option 1C (Figure 6.3.8)



Source: C&S Engineers, Inc.

Option 2 – In-line with long-term development plans, this project includes constructing a new checkpoint at the departure level, directly connected to the Satellite Wiley Concourse by an at-grade connector from the main terminal building. The below-grade connector tunnel would be located as is connects to the lower level of the demolished concourse, which would eventually be reconstructed to serve as the IAF (see Project 2-1). It is assumed that a CATEX would be required.

Snapshot of Terminal Circulation Option 2 – Level 2 (Figure 6.3.9b)



Source: C&S Engineers, Inc.

Phase 1 Land Acquisition

As noted in Section 3.2, in order to enhance the protection of people and property, Airport's should acquire land within the RPZs to clear it of incompatible land uses and obstructions. It is recommended in Phase 1 that any remaining property not owned by the Authority within the existing RPZs should be acquired. Based on the percentage of the parcel that is located within the RPZ, whether there is a roadway frontage, and current development on the parcel, a cost estimate for each parcel was estimated based on recent acquisitions by the Authority. The number of impacted parcels for each RPZ along with the cost estimate is noted below and in **Table 7.2.1**. Since the acquisition is to purchase property to protect existing runways, it is assumed that a CATEX would be required

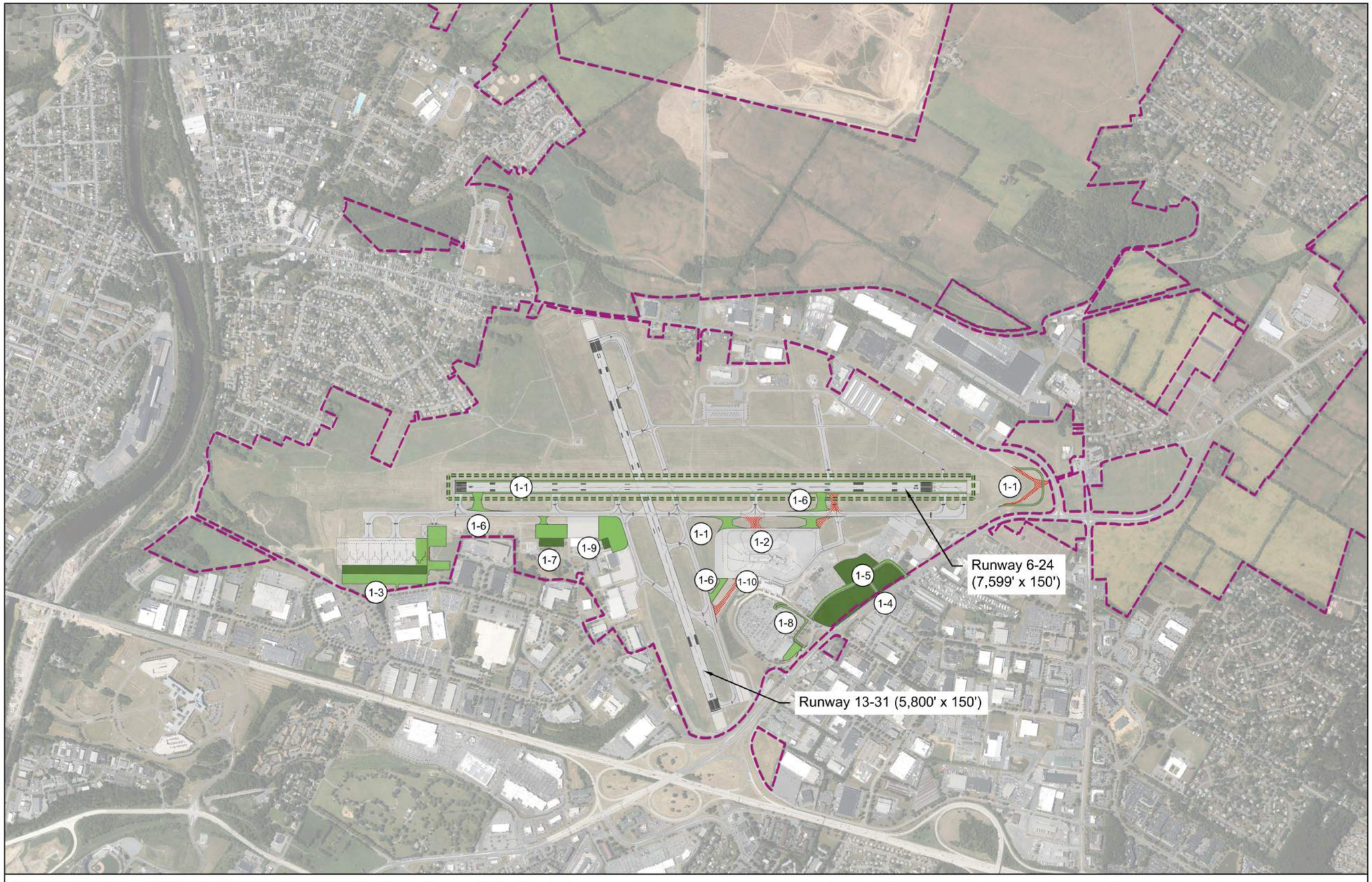
- Runway 6 RPZ – 9 impacted parcels ($1.6 million)
- Runway 24 RPZ – 5 impacted parcels ($1.5 million)
- Runway 13 RPZ – 5 impacted parcels ($3.2 million)
- Runway 31 RPZ – 16 impacted parcels ($3.3 million)

Phase 1 Pavement Maintenance Projects

The pavement management plans conducted for the airside and landside pavements at the Airport identified a number of projects that should be conducted within Phase 1. Each of the projects noted

below would require a CATEX. The need for these projects in the year they are noted may change depending upon when other projects associated with these areas may be completed. See **Appendices F** and **G** for the pavement management plans and more detailed information on each recommended project.

- 2018 – Reconstruct 995 Postal Road west parking lot/loading dock, Hangar 7 parking lot, Hangar 9 parking lots, and 997 Postal Road driveway
- 2019 – Rehabilitate the northwestern portion of Taxiway E and portion of the main terminal apron; Mill and overlay the northeast corner of long-term Parking Lot A and long-term (east) parking lot
- 2020 – Rehabilitate the southeast portion of the main terminal apron; Reconstruct Hangar 3 parking lot and Gate 8 access road
- 2021 – Rehabilitate the northwest portion of the main terminal apron; Reconstruct employee parking lot and Hertz QTA; Mill and overlay 997 Postal Road parking lot and driveway
- 2022 – Rehabilitate the southwest portion of the main terminal apron and Apron 3 near Hangars 2 and 3; Mill and overlay terminal roadways
- 2023 – Rehabilitate the southeast portion of Apron 1 near Hangar 9; Mill and overlay maintenance lot



Phase 1: 0 - 5 Years (2018 - 2023)

1-1 Runway 6-24 Reconstruction & Projects
1-2 Terminal Vertical Circulation Improvements
1-3 Expand Existing Cargo Area
1-4 Landside Circulation Improvements
1-5 Land Use Development (Hotel, Retail, Travel Plaza)
1-6 Taxiway Stub Projects
1-7 Hangar 11 (To Be Constructed in 2018-2019)
1-8 Parking and Ticket Booth Improvements
1-9 FBO Building and Improvements (1) 100x150 FT
1-10 Terminal Security Checkpoint Improvements

Phase 2: 6 - 10 Years (2024 - 2028)

2-1 Terminal IAF Facility
2-2 Northside Parallel Taxiway for Runway 6-24
2-3 New Northside Cargo Facility
2-4 Compatible Development
2-5 Runway 13-31 West Side Parallel Taxiway
2-6 Bulk Hangars (2) 200x200 FT

Phase 3: 11 - 22 Years (2029 - 2040)

3-1 Runway 6-24 Extension (2,400 FT)
3-2 RON
3-3 Fuel Farm Expansion
3-4 Runway 13-31 Extension (1,002 FT)
3-5 Runway 13-31 West Side Parallel Taxiway
3-6 ARFF Building Expansion
3-7 Deice Pad
3-8 Realign Portion of Taxiway B

Phase 4: 23+ Years (2040+)

4-1 3rd Runway and Connecting Taxiways
4-2 Terminal Concourse Extension
4-3 Northside Cargo Expansion
4-4 T-Hangar Rows (4) 12,500 SF Each
4-5 Bulk Hangars (3) 200x200 FT

Legend

- Existing Property Line
- Runway Protection Zone
- Proposed Demolition

Phase 1 (0 - 5 Years)

- Phase 1 Proposed Building
- Phase 1 Proposed Pavement

750' 0' 750' 1500'

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Phase 1

Figure 7.2.2

Table 7.2.1: Proposed Development Plan – Phase 1

Project Number	Start Year	End Year	Description	Cost (in millions)
Phase 1: 0-5 years (2018-2023)				
1-1	2018	2021	Runway 6-24 Rehabilitation & Related Projects	80
1-2	2019	2019	Terminal Circulation Improvements	10
1-3	2019	2021	Expand Existing Cargo Area	53.54
1-4	2019	2020	Landside Circulation Improvements	1.9
1-5	2018	2019	Land Use Development	N/A
1-6	2021	2022	Taxiway Stub Projects	5.12
1-7	2018	2018	Hangar 11	16.5
1-8	2018	2020	Parking and Ticket Booth Improvements	4.5
1-9	2022	2023	FBO Building and Improvements	27.9
1-10	2022	2023	Terminal Security Checkpoint Improvements	10.2
Land Acquisition	2019	2023	Existing RW 6 RPZ	1.6
Land Acquisition	2019	2023	Existing RW 24 RPZ	1.5
Land Acquisition	2019	2023	Existing RW 13 RPZ	3.2
Land Acquisition	2019	2023	Existing RW 31 RPZ	3.3
Maintenance Project	2017	2018	Reconstruct 995 Postal Rd west parking lot & loading dock, Hangar 7 & 9 parking lots, 997 Postal Rd driveway	0.87
Maintenance Project	2018	2019	Mill & overlay long-term overflow parking and long-term east parking	0.88
Maintenance Project	2018	2019	Rehabilitate northwestern portion of TW E and portion of main terminal apron	1.5
Maintenance Project	2019	2020	Rehabilitate southeast portion of main terminal apron	2
Maintenance Project	2019	2020	Reconstruct Hangar 3 parking lot and Gate 8 access road	1.28
Maintenance Project	2020	2021	Mill & overlay 997 Postal Rd front parking lot & driveway	0.19
Maintenance Project	2020	2021	Reconstruct employee parking lot and Hertz QTA	0.45
Maintenance Project	2020	2021	Rehabilitate northwest portion of main terminal apron	2
Maintenance Project	2021	2022	Rehabilitate southwest portion of main terminal apron and Apron 3 near Hangars 2 & 3	1.9
Maintenance Project	2021	2022	Mill & overlay terminal roadways	1
Maintenance Project	2022	2023	Rehabilitate southeast portion of Apron 1 near Hangar 9	1.9
Maintenance Project	2022	2023	Mill & overlay maintenance lot	1.2
			Phase 1 (2018-2023 years)	**234.43 – 253.88**

Phase 2 Projects

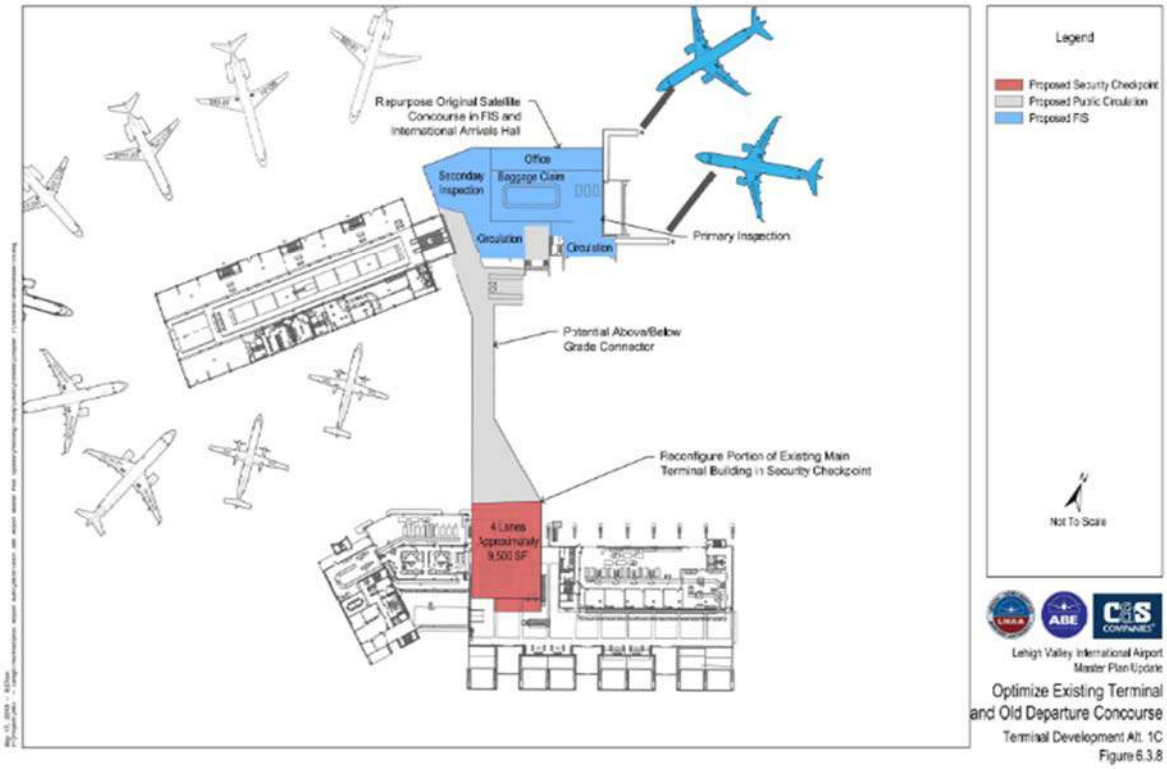
The second phase of development projects focus on landside development, terminal improvements, and hangar development with a number of necessary pavement rehabilitation and maintenance projects, as highlighted in **Figure 7.2.3** and described below. **Table 7.2.2**, provided following Figure 7.2.3, summarizes the Phase 2 Projects with cost estimates.

Project 2-1: Terminal International Arrivals Facility (IAF) (Option 1C $9 million)

As noted with Project 1-10, two options (1C and 2) for establishing an IAF were indicated as preferred options based on the alternatives analysis highlighted in Section 6. Since Option 1C optimizes existing facilities, would be less expensive than Option 2, and planning estimates do not indicate the need for the additional capacity generated by Option 2, Option 1C is most likely the preferred option. While the financial analysis in Section 8 assumes the less expensive Option 1C, both are noted here due to their desirability if funding was not a concern.

Option 1C – This project assumed the IAF is located in the old Satellite Concourse, which would be reconfigured and expanded to accommodate two (2) gates, inspection space, and a baggage claim. It is assumed that a CATEX would be required.

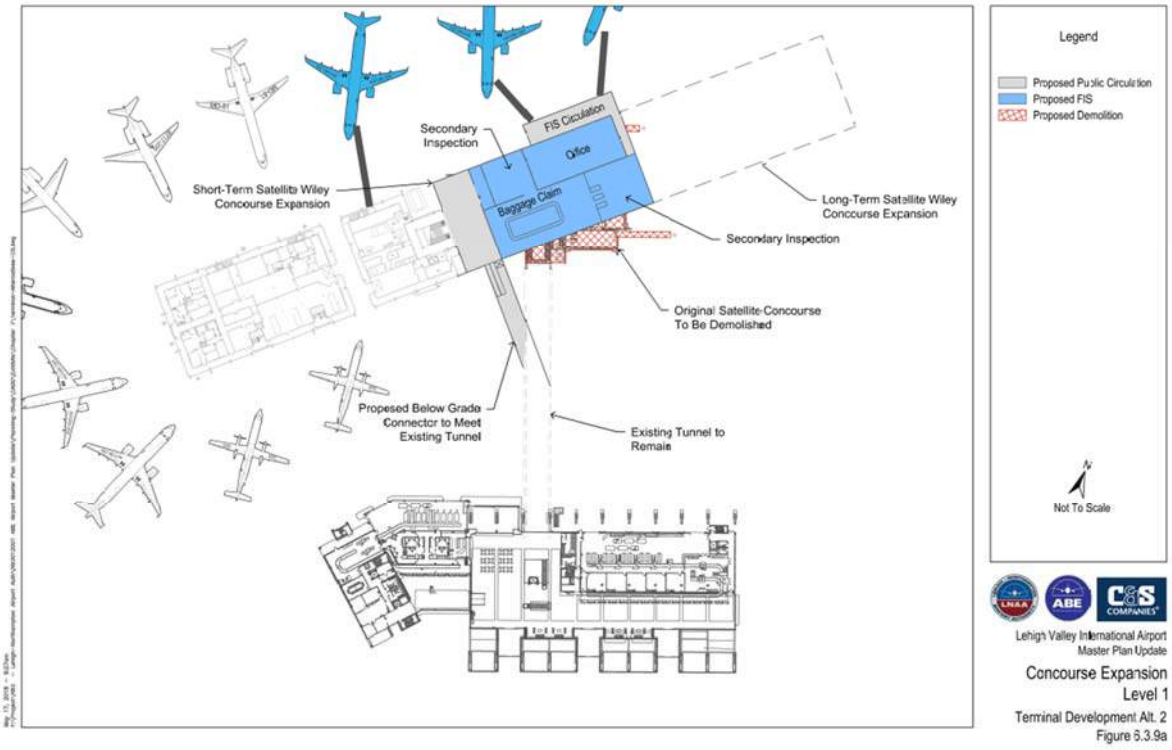
Snapshot of Terminal Circulation Option 1C (Figure 6.3.8)



Source: C&S Engineers, Inc.

Option 2 – In the lower level of the newly constructed portion of the satellite concourse as part of the security checkpoint project (see Project 1-10), an IAF would be established that could accommodate two (2) gates, inspection space, and a baggage claim. It is assumed that a CATEX would be required.

Snapshot of Terminal Circulation Option 2 – Level 1 (Figure 6.3.9a)



Source: C&S Engineers, Inc.

Project 2-2: North Side Parallel Taxiway for Runway 6-24 ($22.45 million)

This project is required to improve the efficiency and capacity of the airfield and enable development north of Runway 6-24, specifically Project 2-3: Northside Cargo Facility. It would be constructed with a 400 foot separation from the runway and it assumes the glide slope has been relocated by others prior to the construction of the taxiway. This project would also require the relocation of the ASOS outside of the new taxiway object free area. The environmental documentation requirement for the taxiway project could require a CATEX or EA depending on anticipated impacts.

Project 2-3: New Northside Cargo Facility ($74.09 million)

The Northside cargo facility provides nine (9) aircraft parking positions for a total of 885,000 square feet of apron space and a linear cargo processing building that is over 160,000 square feet. The facility provides truck dock/maneuvering space and employee parking. The project also includes taxiway connectors to the new Northside parallel. The environmental documentation requirement for the cargo facility would most likely require an EA and may be combined with Project 2-2: Northside Parallel Taxiway for Runway 6-24.

Project 2-4: Northside Compatible Development ($20.5 million)

This project includes tasks related to site development of the Northside to allow for compatible land-use development adjacent to the existing maintenance building. This project also includes the alternative to convert the existing maintenance building to GSE storage, with a relocated maintenance facility required prior to construction. This is what is assumed for the purposes of a cost estimate for this project. A proposed site for the facility will be evaluated as part of this compatible development area. It is assumed that an EA will be required to examine potential associated impacts that could be combined with Projects 2-2 and 2-3.

Project 2-5: Runway 13-31 West Side Parallel Taxiway (Northern Phase) ($6.32 million)

This project will ultimately develop a full parallel taxiway for Runway 13-31 that will thus facilitate hangar development to the north. This portion of the project is for the development of the taxiway between Runway 6-24 and the current Runway 13 end. Details of this project include appropriate taxiway design for appropriate drainage, navigational, and safety elements. It is assumed that a CATEX would be required.

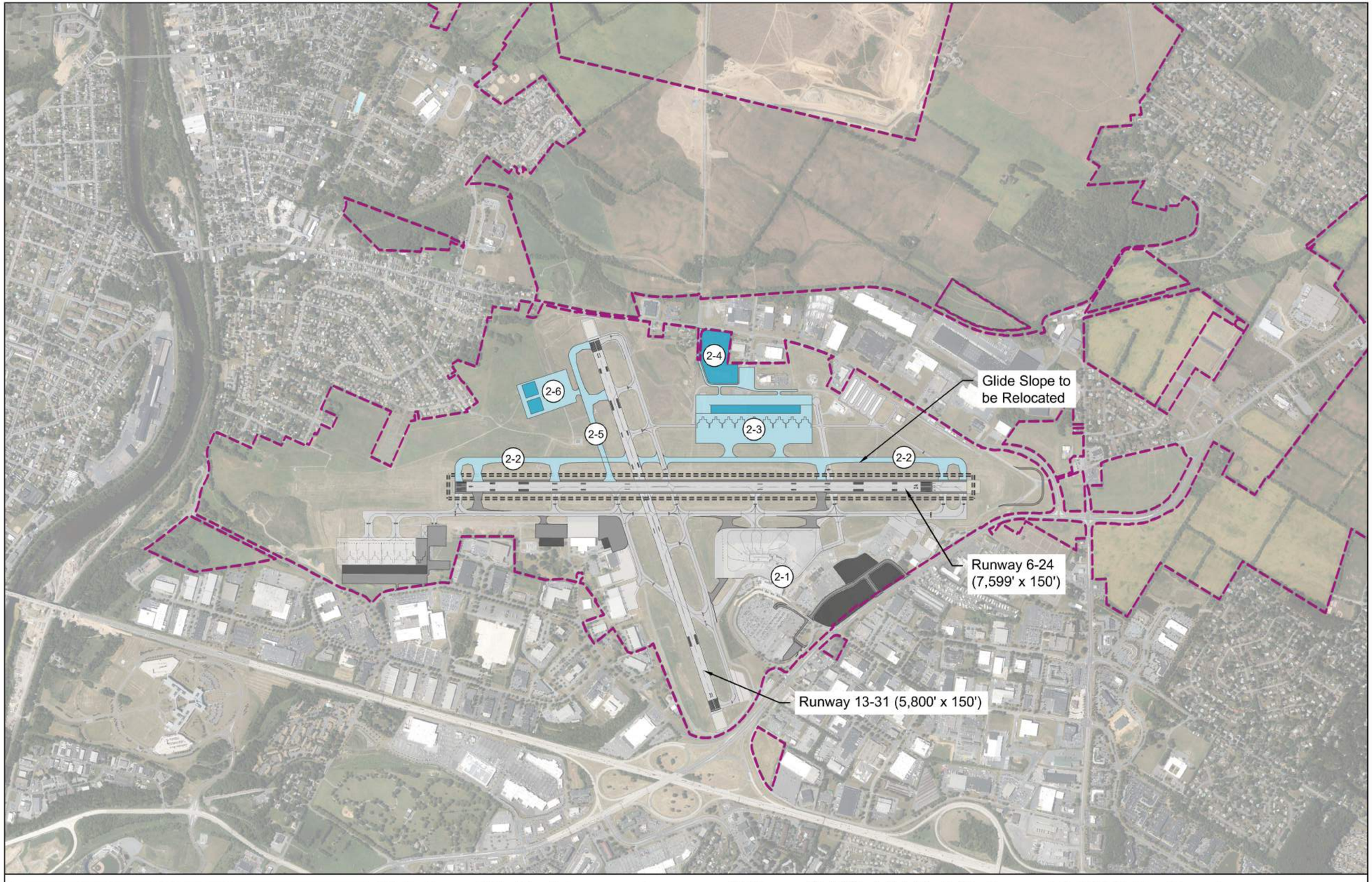
Project 2-6: Bulk Hangars (2) ($24.27 million)

With development in the southwest quadrant and the cargo facility in the northeast quadrant, additional bulk storage hangars have been identified in the northwest quadrant. Section 5 identified the need for almost 60,000 SF of additional bulk hangar space by 2027, therefore two 200 foot by 200 foot hangars (80,000 SF) are shown as a start to the hangar complex on this part of airport property. The development of this complex is dependent upon the construction of the Westside parallel taxiway from Runway 13-31 (Project 2-5). It is assumed that a CATEX would be required.

Phase 2 Pavement Maintenance Projects

The pavement management plans conducted for the airside and landside pavements at the Airport identified a number of projects that should be conducted within Phase 2. Each of the projects noted below would require a CATEX. The need for these projects in the year they are noted may change depending upon when other projects associated with these areas may be completed. See **Appendices F** and **G** for the pavement management plans and more detailed information on each recommended project.

- 2024 – Rehabilitate Taxiway A from the cargo apron to Runway 13-31 and the portion of Apron 9 in front of Hangar 8; Mill and overlay Hangar 2/Rental QTA access road, AVIS QTA and parking lot, Hangar 7/10 parking lots and driveways
- 2025 – Rehabilitate Runway 13-31; Mill and overlay FedEx parking lot and driveway; Reconstruct Hangar 2 parking lot; Crack seal short- and long-term parking/express exit
- 2026 – Rehabilitate Taxiway A from Runway 13-31 to Runway 24 end; Mill and overlay economy/other parking lot
- 2027 – Rehabilitate Taxiway B from Runway 6-24 to Runway 13 end and the southeast portions of Taxiway E; Mill and overlay contractor staging area, Enterprise parking lot, and Hertz parking lot; Seal coat Enterprise QTA, 995/997 Postal Road parking lot/loading dock, and Hangar 9 driveway
- 2028 – Various areas of localized preventative maintenance



Legend

- Existing Property Line
- Runway Protection Zone
- Proposed Demolition

Previous Phase Construction
- Existing Building
- Existing Pavement

Phase 2 (6 - 10 Years)
- Phase 2 Proposed Building
- Phase 2 Proposed Pavement

750' 0' 750' 1500'

Phase 1: 0 - 5 Years (2018 - 2023)
1-1 Runway 6-24 Reconstruction & Projects
1-2 Terminal Vertical Circulation Improvements
1-3 Expand Existing Cargo Area
1-4 Landside Circulation Improvements
1-5 Land Use Development (Hotel, Retail, Travel Plaza)
1-6 Taxiway Stub Projects
1-7 Hangar 11 (To Be Constructed in 2018-2019)
1-8 Parking and Ticket Booth Improvements
1-9 FBO Building and Improvements (1) 100x150 FT
1-10 Terminal Security Checkpoint Improvements

Phase 2: 6 - 10 Years (2024 - 2028)
2-1 Terminal IAF Facility
2-2 Northside Parallel Taxiway for Runway 6-24
2-3 New Northside Cargo Facility
2-4 Compatible Development
2-5 Runway 13-31 West Side Parallel Taxiway
2-6 Bulk Hangars (2) 200x200 FT

Phase 3: 11 - 22 Years (2029 - 2040)
3-1 Runway 6-24 Extension (2,400 FT)
3-2 RON
3-3 Fuel Farm Expansion
3-4 Runway 13-31 Extension (1,002 FT)
3-5 Runway 13-31 West Side Parallel Taxiway
3-6 ARFF Building Expansion
3-7 Deice Pad
3-8 Realign Portion of Taxiway B

Phase 4: 23+ Years (2040+)
4-1 3rd Runway and Connecting Taxiways
4-2 Terminal Concourse Extension
4-3 Northside Cargo Expansion
4-4 T-Hangar Rows (4) 12,500 SF Each
4-5 Bulk Hangars (3) 200x200 FT

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Phase 2

Figure 7.2.3

Table 7.2.2: Proposed Development Plan – Phase 2

Project Number	Start Year	End Year	Description	Cost (in millions)
Phase 2: 6-10 years (2024-2028)				
2-1	2027	2028	Terminal International Arrivals Facility	9
2-2	2025	2026	North Side Parallel Taxiway for Runway 6-24	22.45
2-3	2026	2027	New Northside Cargo Facility	74.09
2-4	2025	2026	Northside Compatible Development	20.5
2-5	2027	2028	Runway 13-31 West Side Parallel Taxiway (Northern Phase)	6.32
2-6	2028	2029	Bulk Hangars (2)	24.27
Maintenance Project	2023	2024	Mill & overlay Hangar 7/10 parking lots & driveways, Hangar 2/QTA access road, and Avis QTA & parking lot	1.67
Maintenance Project	2024	2025	Reconstruct Hangar 2 parking lot and mill & overlay Fedex parking lot & driveway	0.22
Maintenance Project	2024	2024	Rehabilitate Taxiway A from the cargo apron to Runway 13-31 and the portion of Apron 9 in front of Hangar 8	1.2
Maintenance Project	2025	2025	Rehabilitate Runway 13-31	2.8
Maintenance Project	2025	2026	Mill & overlay economy & other parking lots	2.8
Maintenance Project	2026	2027	Mill & overlay contractor staging area, Enterprise parking lot, and Hertz parking lot	0.34
Maintenance Project	2026	2027	Seal coat Enterprise QTA, 995 Postal Rd south parking lot, 997 Postal Rd loading dock area, and Hangar 9 driveway	0.073
Maintenance Project	2026	2026	Rehabilitate Taxiway A from Runway 13-31 to Runway 24 end	1.4
Maintenance Project	2027	2027	Rehabilitate Taxiway B from Runway 6-24 to Runway 13 end and the southeast portions of Taxiway E	0.8
Maintenance Project	2028	2028	Various areas of localized preventative maintenance	1
			Phase 2: 6-10 years (2024-2028)	**168.933 – 173.033**

Phase 3 Projects

The third phase of development projects focus on lengthening both runways along with the expansion/addition of other key support facilities such as the ARFF, remain overnight parking areas, fuel farm, and deicing pad, as highlighted in **Figure 7.2.4** and described below. **Table 7.2.3**, provided following Figure 7.2.4, summarizes the Phase 3 Projects with cost estimates.

Project 3-1: Runway 6-24 Extension (2,400 FT) ($41.95 million)

This project implements the recommendation that 10,000 feet remains the appropriate length for the primary runway through the planning period. Differing from previous implementation strategies, this alternative is not recommending a phased approach, but instead recommends a single 2,400 foot extension. The efficiencies achieved through the economies of scale result in lower overall project costs. Other project benefits include shorter overall operational disruption and compliance with standards (e.g., RPZ acquisition). Project phasing may be required if there is funding limitations for completing the project as proposed. This project is expected to cost $21 million, exclusive of land acquisition. It is assumed an EA would be required.

Project 3-2: Remain Overnight (RON) Apron ($9.95 million), Deicing Pad ($8 million), or Compatible Aeronautical Development

The area that currently houses the old government building should be preserved for aircraft parking. The ramp could be used as a parking area for diversions, space for aircraft with mechanical issues, or a general parking or staging area that serves the terminal. For the purposes of this development plan and cost estimates, it is assumed the building is demolished and the area is developed as a remain overnight (RON) apron and would be constructed towards the beginning of Phase 3. It is assumed that a CATEX would be required.

This area could also support a project that includes the construction of a 225,000 SF deicing pad north of the existing terminal apron and adjacent to the existing Taxiway E. The remainder of the area shown as Project 3-2, not used as a RON or deicing pad, would be reserved for other aeronautical uses such as hangars, storage buildings, updated rental QTA, etc. It is assumed the deicing pad would be constructed near the end of Phase 3 and require a CATEX, but the environmental documentation required for the rest of the designated area would depend upon the type of project ultimately proposed.

Project 3-3: Fuel Farm Expansion ($8.38 million)

The Fuel Farm project reserves an area adjacent to the existing fuel farm to allow for expansion as demand dictates. An area large enough to mirror the existing fuel farm was identified. This allows the Airport to double its fuel farm capacity. It is assumed a Short Form EA or EA would be required, depending on potential impacts.

Project 3-4: Runway 13-31 Extension (1,002 FT) ($64.6 million)

Since Runway 13-31 is not required as a crosswind runway for the critical aircraft using Runway 6-24, the length requirement is based on the needs of GA aircraft using the airfield. As noted in Section 5 and the previous master plan, this would mean a runway length of up to 7,200 feet for Runway 13-31. While this project precedes the development of a third runway parallel to Runway 6-24, the ultimate location of this third runway limits the possible extension of Runway 13-31 due to airport property boundaries. In order

to maximize the potential length of the future third runway and avoid any runway safety area conflicts, it is recommended that the 13 end is extended a total of 1,002 feet, which includes an EMAS bed, for a final Runway 13-31 length of 6,802 feet. It is assumed an EA would be required for this project.

Project 3-5: Runway 13-31 West Side Parallel Taxiway (Southern Phase) ($12.12 million)

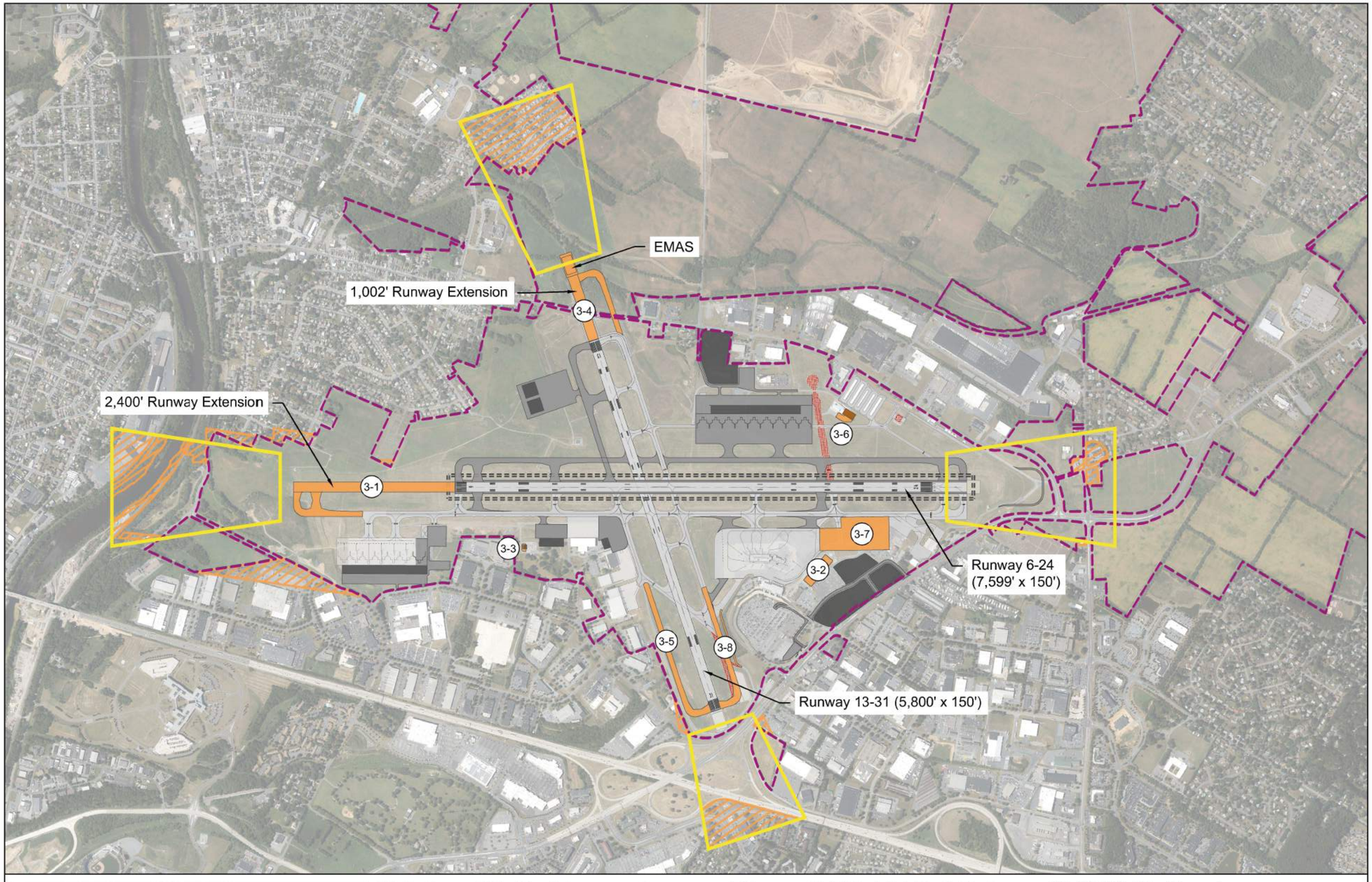
To obtain a full parallel taxiway on the west side of Runway 13-31 the southern phase needs to be constructed. The taxiway portion to the south would allow access to aircraft moving between the FBO to Runway 31 without having to crossover the runway via Taxiway A and B. Grading and drainage challenges pose the potential for a significant increase in the cost estimate to construct the southern portion of this proposed taxiway. Based on information available at the time of this master plan, this project is estimated to cost $12.2 million. This should be further evaluated when this alternative is implemented. The environmental documentation requirement for the taxiway project could require a CATEX or EA depending on anticipated impacts.

Project 3-6: ARFF Building Expansion ($1 million)

The ARFF Building expansion project was identified to reserve room for growth next to the existing ARFF facility specifically if the Airport moves from an Index C to Index D. As a result, the master plan is not programming the specific components of those improvements. Taxiway improvements that maintain airfield access are programmed under the taxiway alternatives. For the purposes of the master plan update, it is assumed this project includes a 20% increase in building size for just under $1 million. It is assumed that a CATEX or short form EA, depending on affected environmental resources, would be required.

Project 3-7: Realign Portion of Taxiway B ($7.01 million)

The existing separation between Taxiway B and the Runway 31 end does not meet current FAA separation standards. This project would address the current modification to standard and increase the separation 57 feet to the required 400 foot separation. This project will require significant grading and a portion of the vehicle service road would be relocated. It is assumed that a CATEX would be required.



Legend

- Existing Property Line
- Runway Protection Zone
- Proposed Demolition

Previous Phase Construction
- Existing Building
- Existing Pavement

Phase 3 (11 - 22 Years)
- Phase 3 Proposed Building
- Phase 3 Proposed Pavement
- Phase 3 Property Acquisition

750' 0' 750' 1500'

Phase 1: 0 - 5 Years (2018 - 2023)
1-1 Runway 6-24 Reconstruction & Projects
1-2 Terminal Vertical Circulation Improvements
1-3 Expand Existing Cargo Area
1-4 Landside Circulation Improvements
1-5 Land Use Development (Hotel, Retail, Travel Plaza)
1-6 Taxiway Stub Projects
1-7 Hangar 11 (To Be Constructed in 2018-2019)
1-8 Parking and Ticket Booth Improvements
1-9 FBO Building and Improvements (1) 100x150 FT
1-10 Terminal Security Checkpoint Improvements

Phase 2: 6 - 10 Years (2024 - 2028)
2-1 Terminal IAF Facility
2-2 Northside Parallel Taxiway for Runway 6-24
2-3 New Northside Cargo Facility
2-4 Compatible Development
2-5 Runway 13-31 West Side Parallel Taxiway
2-6 Bulk Hangars (2) 200x200 FT

Phase 3: 11 - 22 Years (2029 - 2040)
3-1 Runway 6-24 Extension (2,400 FT)
3-2 RON
3-3 Fuel Farm Expansion
3-4 Runway 13-31 Extension (1,002 FT)
3-5 Runway 13-31 West Side Parallel Taxiway
3-6 ARFF Building Expansion
3-7 Deice Pad
3-8 Realign Portion of Taxiway B

Phase 4: 23+ Years (2040+)
4-1 3rd Runway and Connecting Taxiways
4-2 Terminal Concourse Extension
4-3 Northside Cargo Expansion
4-4 T-Hangar Rows (4) 12,500 SF Each
4-5 Bulk Hangars (3) 200x200 FT

Lehigh Valley International Airport
Master Plan Update

Phase 3

Figure 7.2.4

Table 7.2.3: Proposed Development Plan – Phase 3

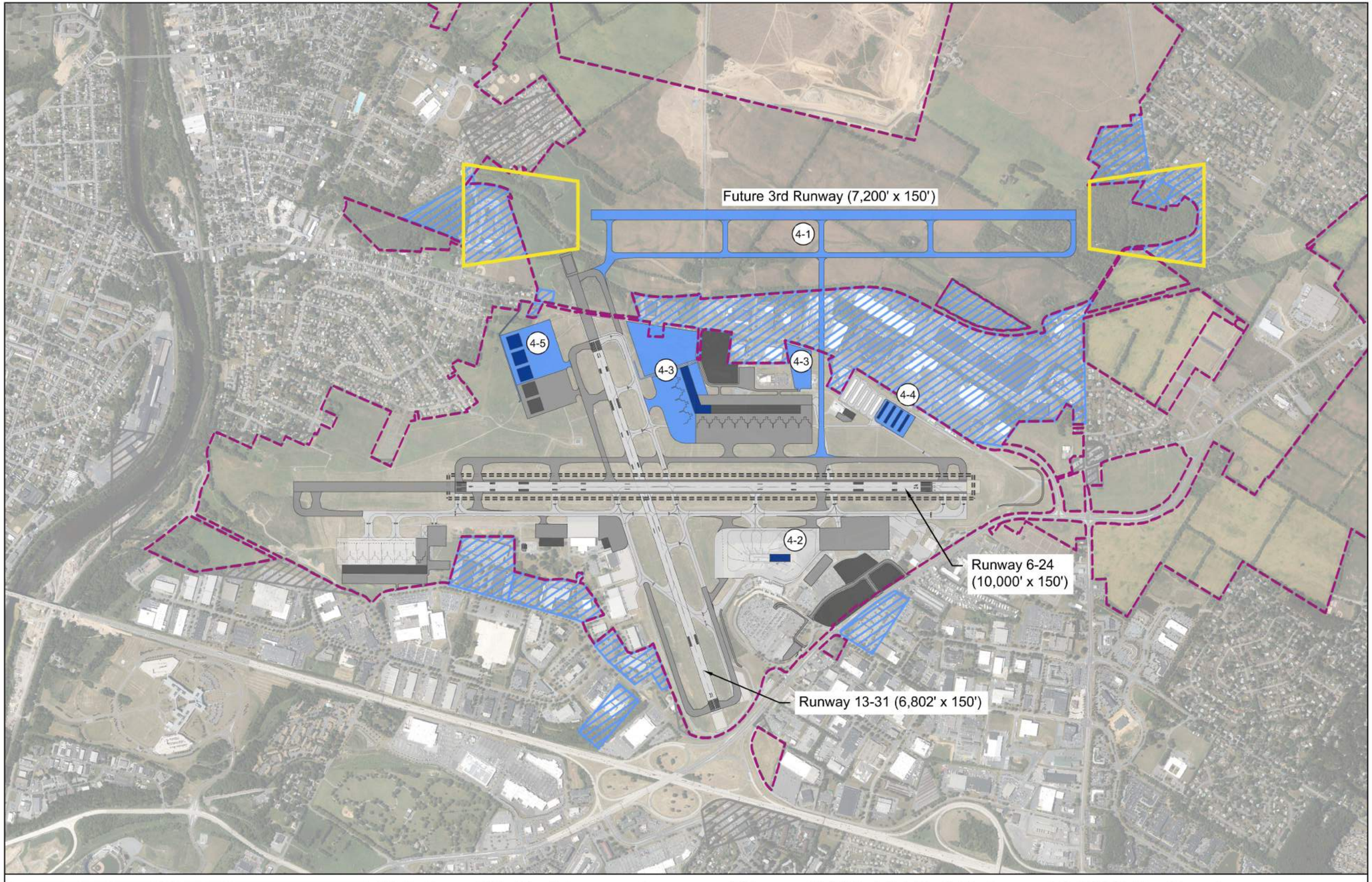
Project Number	Start Year	End Year	Description	Cost (in millions)
Phase 3: 11-22 years (2029-2040)				
3-1	2029	2032	Runway 6-24 Extension (2,400 FT)	41.95
3-2	2032	2033	Remain Overnight Apron or Compatible Aeronautical Development	9.95
	2039	2040	Deicing Pad or Compatible Aeronautical Development	8
3-3	2033	2034	Fuel Farm Expansion	8.38
3-4	2035	2038	Runway 13-31 Extension (1,002 FT)	64.6
3-5	2038	2039	Runway 13-31 West Side Parallel Taxiway (Southern Phase)	12.12
3-6	2039	2040	ARFF Building Expansion	1
3-7	2039	2040	Realign Portion of Taxiway B	7.01
			Phase 3: 11-22 years (2029-2040)	**153.01**

Phase 4 Projects

The fourth phase of development projects are not part of the 20-year planning period associated with the master plan update. The facility requirements analysis does not indicate these improvements or facilities are needed but they are shown for future consideration and the preservation of potential development areas. The need or justification for these projects are susceptible to changes in airport activity and demand. While their need is not currently justified, if the demand arises or operations change significantly, the area needed for these projects is preserved and ready for implementation. The Phase 4 projects in **Figure 7.2.5** include the following:

- Project 4-1: 3rd Runway and Connecting Taxiways
- Project 4-2: Terminal Concourse Expansion
- Project 4-3: Northside Cargo Expansion

As the development of the third runway is considered, property would be acquired along Race Street between the Runway 13 end and Weaversville/Schoenersville Roads to construct a taxiway to connect Runway 6-24 to the 3rd runway and create internal airfield space bounded by the three runways. As the Northside area of the Airport is developed, properties south of Race Street not currently owned by the Airport may need to be acquired at that time. The property within the third runway RPZs would also need to be acquired. Other potential land acquisition areas include the parcels along Postal Road and Airport Road to enhance access and development adjacent to the Airport.



Legend

- Existing Property Line
- Runway Protection Zone
- Proposed Demolition

Previous Phase Construction
- Existing Building
- Existing Pavement

Phase 4 (23+ Years)
- Phase 4 Proposed Building
- Phase 4 Proposed Pavement
- Phase 4 Property Acquisition

750' 0' 750' 1500'

Phase 1: 0 - 5 Years (2018 - 2023)
1-1 Runway 6-24 Reconstruction & Projects
1-2 Terminal Vertical Circulation Improvements
1-3 Expand Existing Cargo Area
1-4 Landside Circulation Improvements
1-5 Land Use Development (Hotel, Retail, Travel Plaza)
1-6 Taxiway Stub Projects
1-7 Hangar 11 (To Be Constructed in 2018-2019)
1-8 Parking and Ticket Booth Improvements
1-9 FBO Building and Improvements (1) 100x150 FT
1-10 Terminal Security Checkpoint Improvements

Phase 2: 6 - 10 Years (2024 - 2028)
2-1 Terminal IAF Facility
2-2 Northside Parallel Taxiway for Runway 6-24
2-3 New Northside Cargo Facility
2-4 Compatible Development
2-5 Runway 13-31 West Side Parallel Taxiway
2-6 Bulk Hangars (2) 200x200 FT

Phase 3: 11 - 22 Years (2029 - 2040)
3-1 Runway 6-24 Extension (2,400 FT)
3-2 RON
3-3 Fuel Farm Expansion
3-4 Runway 13-31 Extension (1,002 FT)
3-5 Runway 13-31 West Side Parallel Taxiway
3-6 ARFF Building Expansion
3-7 Deice Pad
3-8 Realign Portion of Taxiway B

Phase 4: 23+ Years (2040+)
4-1 3rd Runway and Connecting Taxiways
4-2 Terminal Concourse Extension
4-3 Northside Cargo Expansion
4-4 T-Hangar Rows (4) 12,500 SF Each
4-5 Bulk Hangars (3) 200x200 FT

Lehigh Valley International Airport
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Phase 4

Figure 7.2.5

7.3 Supplemental Projects, Programs, and Initiatives

Throughout the master planning process, a number of projects, programs, and initiatives were identified that are not part of the recommended capital development plan but are considered because they are directly affected by these capital projects. In addition, some of these supplemental projects can only be refined and implemented once the specific capital project is designed. This is especially applicable for drainage and stormwater projects. This section also identifies recommendations conducted as part of the master plan including the Solid Waste and Recycling Plan (**Appendix J**), Drainage Evaluation and Master Plan (**Appendix K**), building assessment, and utility inventory, as well as generally through the inventory and facility requirement evaluations (**Appendix C – Inventory Materials**).

Solid Waste and Recycling Plan

The Solid Waste and Recycling Plan, noted in Section 3.10, documents the review of current practices and waste management contracts to identify opportunities to minimize the generation of solid waste, increase the diversion rate of materials from landfills, reduce operations and maintenance needs, and minimize costs and/or generate revenue via waste recovery practices.

The Airport provides a robust recycling program and has measures to improve its implementation with initiatives focused on waste minimization and diversion from landfills. The following additional measures can expand the program further, support efficiency, and increase awareness and education (see **Appendix J** for more information):

- Minimize waste generation with paperless administration procedures, e-design and construction, mulching of green waste, reuse of millings for pavement areas, and the use of liquid collection stations and water refill stations.
- Divert waste generation from landfills via actions of the Airport Authority Recycling Committee.
- Further, minimize waste generation via the establishment of quantitative waste reduction and recycling goals and targets, the further reduction of disposable water bottles, the modification of the existing waste management contract, enabling flexibility in pick-up schedules, the reduction in current printing practices, and via collaboration with tenants on procurement.
- Increase diversion of waste from landfills via: the expansion of education and awareness efforts through the Recycling Committee, the increased reuse of materials, the establishment of minimum construction and demolition recycling targets, the promotion of recycling in concession areas, increased composting efforts, the implementation of a food donation program, and incentivizing tenants to engage in recycling efforts.

Drainage Evaluation and Master Plan

The Drainage Evaluation and Master Plan, included as **Appendix K**, included an evaluation of the existing drainage conditions at the Airport and provided a planning-level analysis of the new stormwater management facilities that may be required due to the implementation of the proposed capital improvement plan.

The evaluation of the existing drainage system indicated issues with erosion near the outfall just northeast of the maintenance building and that the stormwater facility near the main parking lot is difficult to maintain due to steep slopes and standing water. A capacity analysis of the existing pipe system identified a number of pipes are currently undersized and should be upgraded when possible.

The Consultant team applied a hydrologic model to identify planning-level stormwater mitigation measures for the preferred development plan. The model identified 12 new potential stormwater ponds along with the expansion of two existing facilities. Stormwater runoff from the development plan should be able to mitigate on-site applying best management practices for common stormwater management facilities. While **Appendix K** includes the detailed calculations and information regarding the recommended mitigation measures the final designs of these facilities would need to be completed based on actual topographic survey, specific project design information, and more detailed calculations.

Utility/Building Assessments

- Implementation of structural, architectural, plumbing, fire sprinkler/fire alarm system, HVAC, electric service, and security communications/IT recommendations for Hangar 2, 3, and 7 as indicated in Table 3.8.1 of Section 3.8 and further discussed in the Building Assessments component of **Appendix C – Inventory Materials**.
- Development of a utility plan to gauge accurately utility component capacities. This would be a high-level planning document and be sufficiently developed such that design professionals can make informed decisions on capital budgeting and project design. The plan should include the following:
  - Inventory all airport utility data sets and convert them into a single, unified electronic source, such as CAD or GIS, (paper documentation would require an additional level of effort).
  - Harmonize the data using common industry utility standards, such as the American Society of Civil Engineers (ASCE) Subsurface Utility Engineering (SUE) standards.
  - Have utility professionals, licensed engineers; perform a basic review and documentation of both data gaps and utility capacities at key truck points (e.g., cubic feet per second of flow capacity for stormwater features).
  - A report of existing utility conditions and capacities that compare them to the needs/demands of future development at the Airport.

Terminal Considerations

- Potential opportunity for reconfiguration of check-in positions as airlines switch check-in types throughout the planning period.
- Potential need for baggage carousel replacement during the course of the planning period.
- Utilize opportunities for improved concession areas by working with a master concessionaire or a series of concessionaires to create a sense of place for the Airport, increase customer convenience and to maximize concession revenue.

Landside Considerations

- Improved wayfinding for drivers to reduce confusion when deciding between the multi-modal center, both curbside areas, short- and long-term parking, and the cell phone lot. Improvements should be

made in the short-term to address the existing circulation pattern by updating wayfinding signage to accompany the future changes in circulation would be included as part of that project (see Project 1-4 in Section 7.2).

- Monitor curbside activity especially that of taxi/limo/transportation network carriers (TNC). This information can be used to improve future curbside operations and allow the opportunity to capitalize on potential revenue.

Equipment/Vehicle Considerations

- Implement initiatives to purchase hybrid or electric vehicles as replacements for GSE equipment as it reaches the end of its useful life.
- Phase SRE equipment purchases/rentals to ensure the appropriate equipment exists to meet Priority 1 Airfield clearance requirements.
- As current FBO fuel truck vehicles approach the end of their useful life, phase purchases to prevent delays in the ability for future fuel distribution.

Other Initiatives

- Pursue market-supported concepts that enhance airport customer amenities.
- Pursue site readiness, such as the rezoning or use of "special exception" processes, to streamline site development.
- Streamline marketing approaches, brand the airport as a gateway and create focused marketing collateral to promote opportunities.
- Conduct developer outreach to identify and understand those interested in entering the market in regards to land-use planning.