



# Chapter 4

## Alternatives Analysis

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Image by Delta Airport Consultants

### 4|Section 1 - Introduction

This chapter describes and evaluates the development alternatives leading to the selection of the recommended development plan for the Las Cruces International Airport (LRU). The alternatives identified are necessary to accommodate the facility requirements discussed in Chapter Three and to meet the City's overall strategic goals. These alternatives provide the City with a basis to plan airport development in the most safe and efficient manner. The evaluation of these alternative concepts considered facility requirements, aircraft operational needs, potential environmental impacts, future development capability, and estimated costs with the intent of selecting a preferred operational alternative.

### 4|Section 2 - Goals

Each alternative within this chapter has been developed with consideration of the following goals:

- Conform to the best practices for safety and efficiency
- Meet FAA airport standards and local standards and codes
- Conform to the local and state transportation plans
- Accommodate forecast growth throughout the planning period
- Meet the airport's operational objectives
- Enhance the ability to maintain airport facilities in a cost-efficient manner
- Help the airport become as financially self-sufficient as possible
- Preserve ability to attract scheduled air-carrier service, cargo service, and/or large aircraft maintenance facilities.
- Provide flexibility to accommodate changes in the community and industry
- Provide ability for growth beyond the planning horizon
- Be technically and financially feasible
- Minimize potential adverse environmental impacts

The City is fortunate in that there is considerable airport land available to meet its goals. This enables a wide range of alternatives to be considered without significant constraints due to land acquisition needs. Each alternative presented in this Chapter is able to be developed without the City acquiring additional property for airfield or terminal area expansion.

## 4|Section 3 - Terminal Area Alternatives

Three development alternatives were considered and discussed at length during both an open Public House and several Airport Advisory Board meetings. Each Alternative has been reviewed relative to its ability to meet desired goals, operational needs, airfield efficiency, planning standards, environmental factors and cost. Alternatives for terminal area development are shown in Figures 4-1, 4-2, and 4-3. The City's preferred alternative is shown in Figure 4-4.

### 4.3|Part 01 - Terminal Area Alternative One

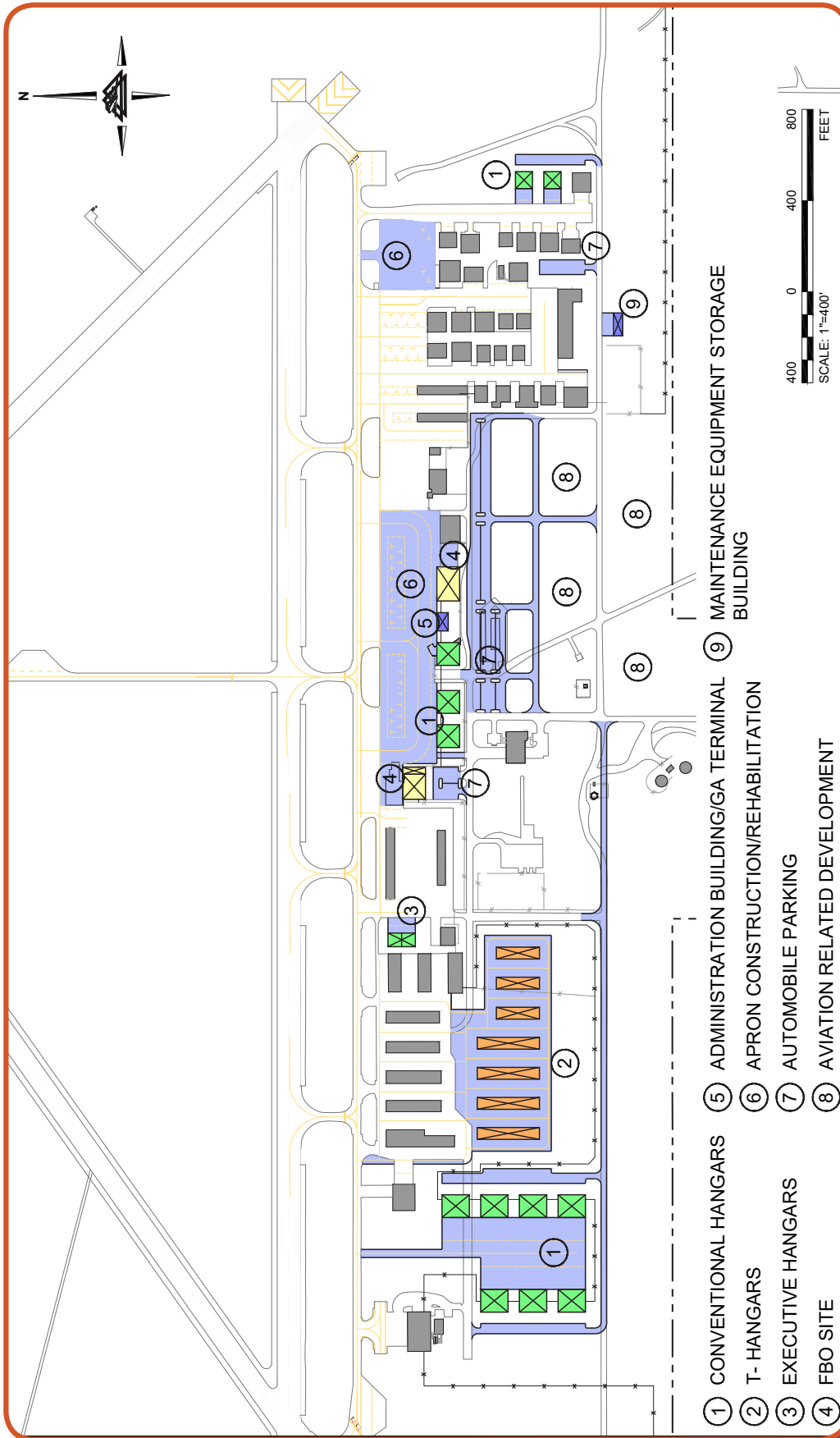
A detailed layout of Terminal Area Alternative One appears in **Figure 4-1**. Key features are listed below:

#### Key Features

- Preserves existing hangars and aprons.
- Preserves existing location of fuel storage facilities and the City's firefighting facility.
- Provides for an administrative building/general aviation terminal building.
- Provides for additional conventional hangars (multi-aircraft).
- Provides for additional T-hangars.
- Provides for additional executive (corporate) hangars.
- Provides for at least two FBO locations.
- Provides for a maintenance equipment storage building.
- Provides for a landside area for aviation-related development that does not need to have direct access to the airfield.
- Provides for an improved automobile parking layout.
- Provides for additional apron that is related to new hangars layouts.

#### Assessment

- Efficient layout that maintains current general traffic flow.
- New hangars/apron facilities layout is flexible and development can be demand driven.
- FBO locations are generally in the location of existing FBOs, improved to meet geometric standards and better customer access.
- Based on ecological and cultural surveys (see Chapter One and Appendices), no significant environmental impacts are expected.
- A new administrative building/general aviation terminal building is collocated with an FBO facility, which is a business model typical of many general aviation airports.
- Preserves plenty of land for aviation-related use that does not need to have airfield access.



**Figure 4-1. Terminal Area Alternative One**

Source: Delta Airport Consultants, Inc.

### 4.3|Part 02 - Terminal Area Alternative Two

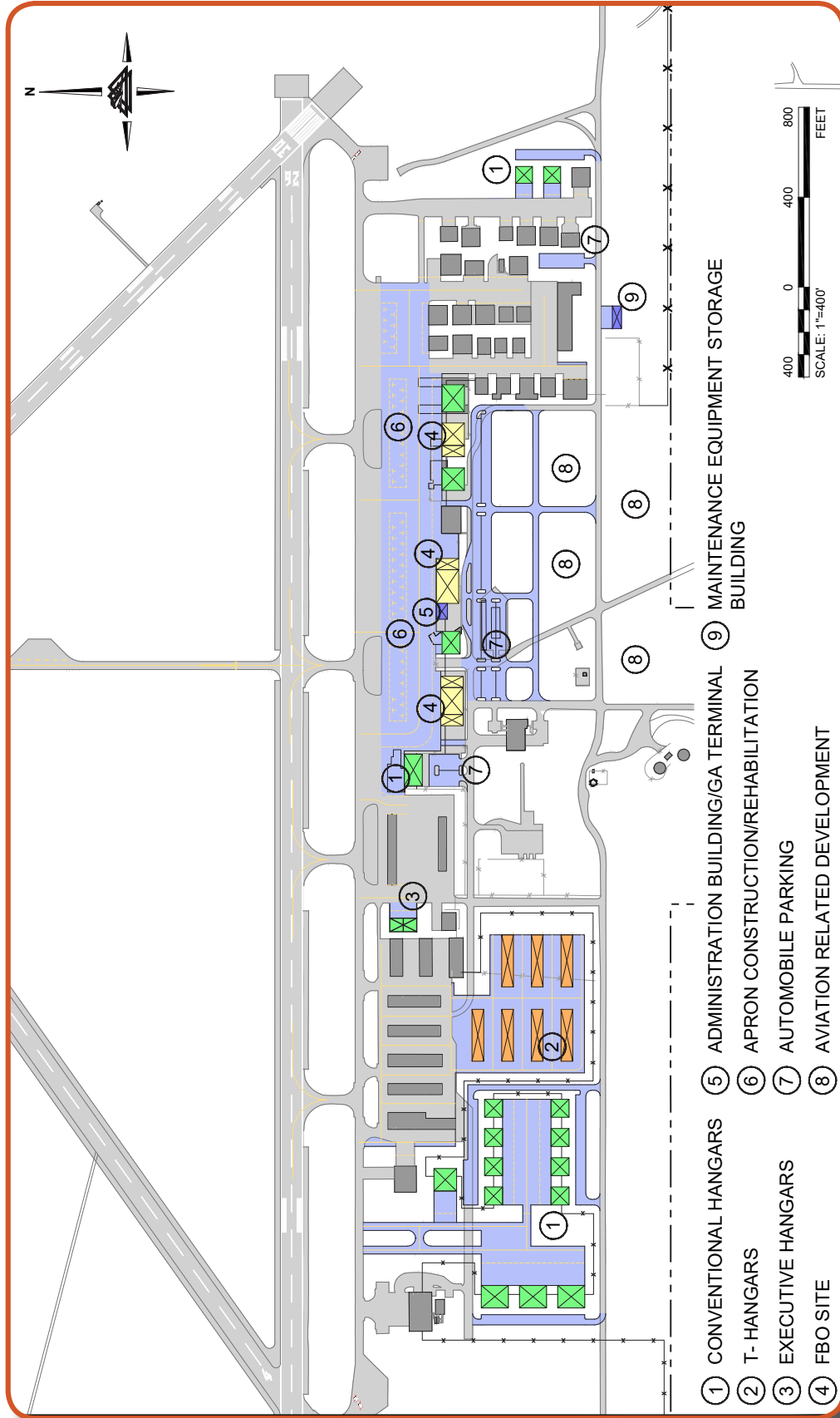
A detailed layout of Terminal Area Alternative Two appears in **Figure 4-2**. Key features are listed below.

#### Key Features

- Preserves existing hangars and aprons.
- Preserves existing location of fuel storage facilities and the City's firefighting facility.
- Provides for an administrative building/general aviation terminal building.
- Provides for additional conventional hangars (multi-aircraft).
- Provides for additional T-hangars.
- Provides for additional executive (corporate) hangars.
- Provides for three possible FBO locations.
- Provides for a maintenance equipment storage building.
- Provides for a landside area for aviation-related development that does not need to have direct access to the airfield.
- Provides for an improved automobile parking layout.
- Provides for additional apron that is related to new hangars layouts.

#### Assessment

- New hangars/apron facilities layout is flexible and development can be demand driven.
- The new T-hangar orientation on the west side is perpendicular to the existing hangar layout and does not have as efficient a flow as does Terminal Area Alternative One.
- FBO locations are close to one another creating possible confusion over leased areas. One of the locations does not reflect one of the existing FBOs.
- Based on ecological and cultural surveys (see Chapter One and Appendices), no significant environmental impacts are expected.
- The administrative building/general aviation terminal building is collocated with an FBO facility, which is a business model typical of many general aviation airports.
- Preserves plenty of land for aviation-related use that does not need to have airfield access.



**Figure 4-2. Terminal Area Alternative Two**

Source: Delta Airport Consultants, Inc.

### 4.3|Part 03 - Terminal Area Alternative Three

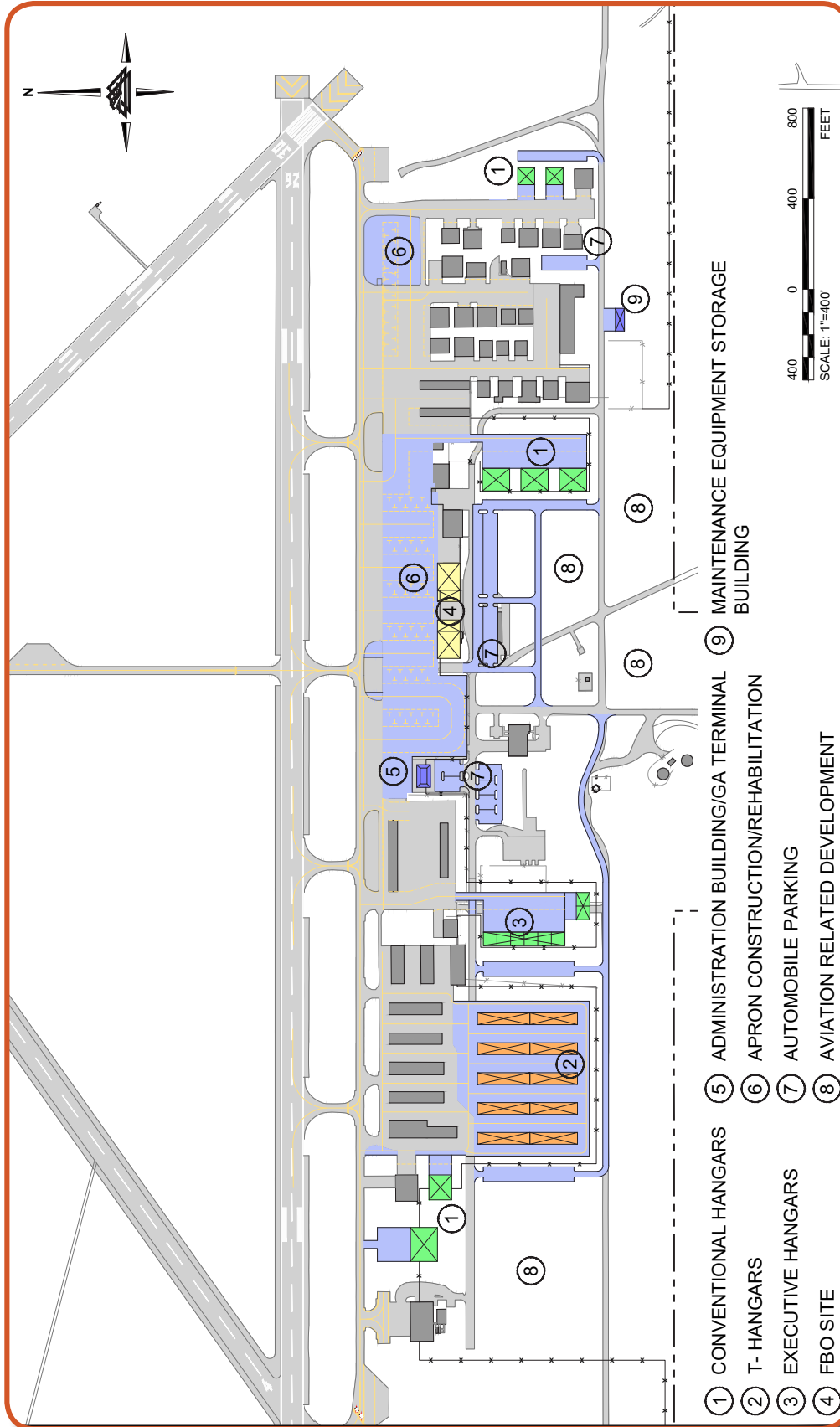
A detailed layout of Terminal Area Alternative Three appears in **Figure 4-3**. Key features are listed below.

#### Key Features

- Preserves existing hangars and aprons.
- Preserves existing location of fuel storage facilities and the City's firefighting facility.
- Provides for an administrative building/general aviation terminal building.
- Provides for additional conventional hangars (multi-aircraft).
- Provides for additional T-hangars.
- Provides for additional executive (corporate) hangars.
- Provides for at least two FBO locations.
- Provides for a maintenance equipment storage building.
- Provides for a landside area for aviation-related development that does not need to have direct access to the airfield.
- Provides for an improved automobile parking layout.
- Provides for additional apron that is related to new hangars layouts.

#### Assessment

- Efficient layout that maintains current general traffic flow.
- New hangars/apron facilities layout is flexible and development can be demand driven.
- FBO locations are close to one another creating possible confusion over leased areas. One of the locations does not reflect one of the existing FBOs.
- Based on environmental and cultural surveys (see Chapter One and Appendices), no significant environmental impacts are expected.
- The administrative building/general aviation terminal building is a standalone building and does not provide the flexibility to be collocated with an FBO facility.
- Does not allow as many conventional hangar locations as Alternate One.
- Preserves plenty of land for aviation-related use that does not need to have airfield access.



**Figure 4-3. Terminal Area Alternative Three**

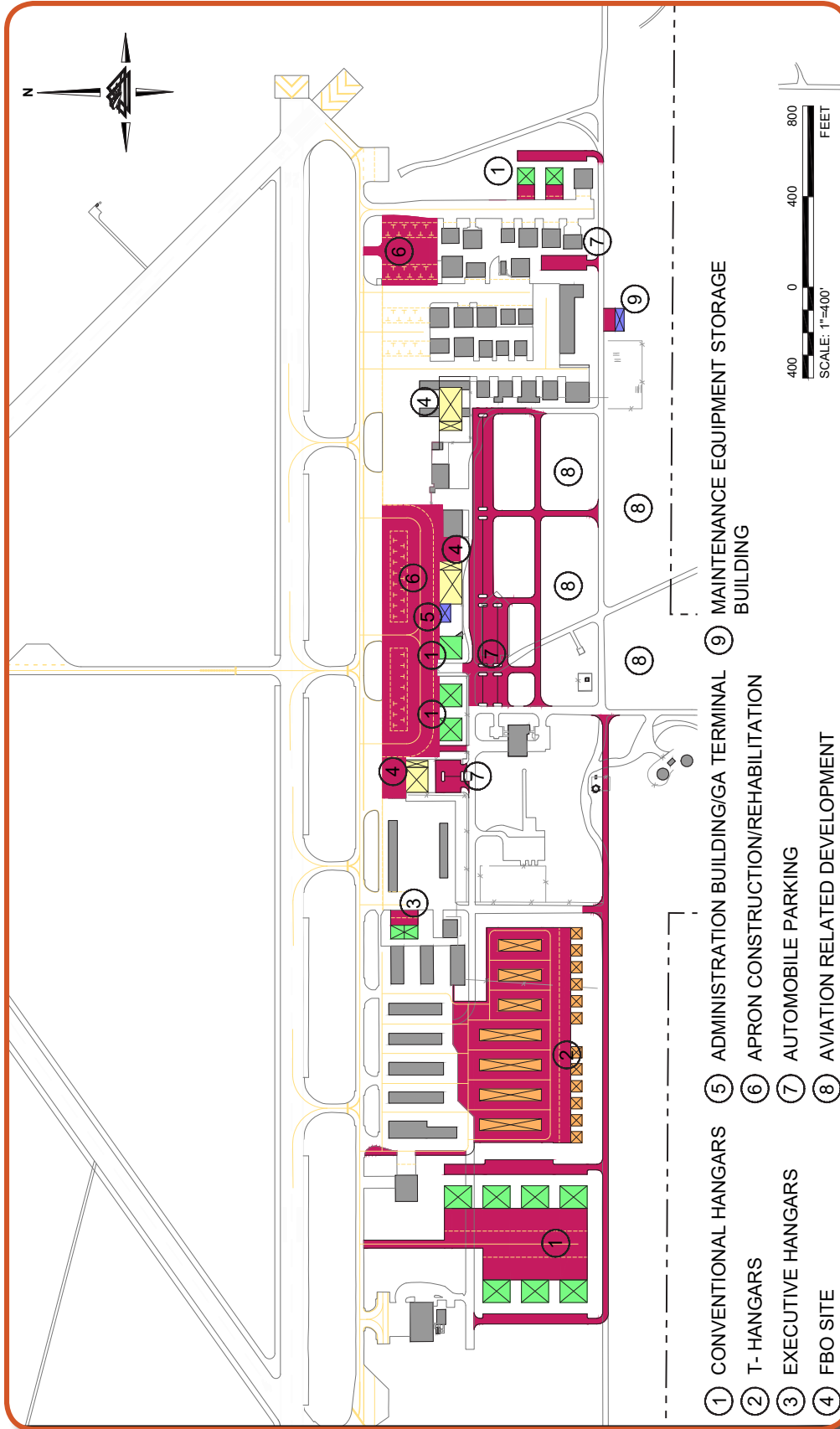
Source: Delta Airport Consultants, Inc.

### 4.3|Part 04 - Terminal Area Preferred Alternative

Alternative One is the preferred Terminal Area layout. See **Figure 4-4**. This layout was accepted by City staff and Advisory Board based on their review of the various layouts. It provides the most flexibility, most efficient flow, and conforms to current FBO locations and FBO business plans.

The cost considerations for the alternatives reviewed are similar in that new hangars will likely be privately financed and other development such as rehabilitation of terminal apron is the same for each (estimated \$4.8 million for reconstruction of all terminal area aprons).





**Figure 4-4. Terminal Area Preferred Alternative**

Source: Delta Airport Consultants, Inc.

## 4|Section 4 - Airfield Alternatives

Three development alternatives were considered and discussed at length during both an open Public House and several Airport Advisory Board meetings. Each Alternative has been reviewed relative to its ability to meet desired goals, operational needs, airfield efficiency, planning standards, environmental factors and cost. Airfield Alternatives are shown in Figures 4-5, 4-6, and 4-7. The City's preferred alternative is shown in Figure 4-8.

### 4.4|Part 01 - Airfield Alternative One

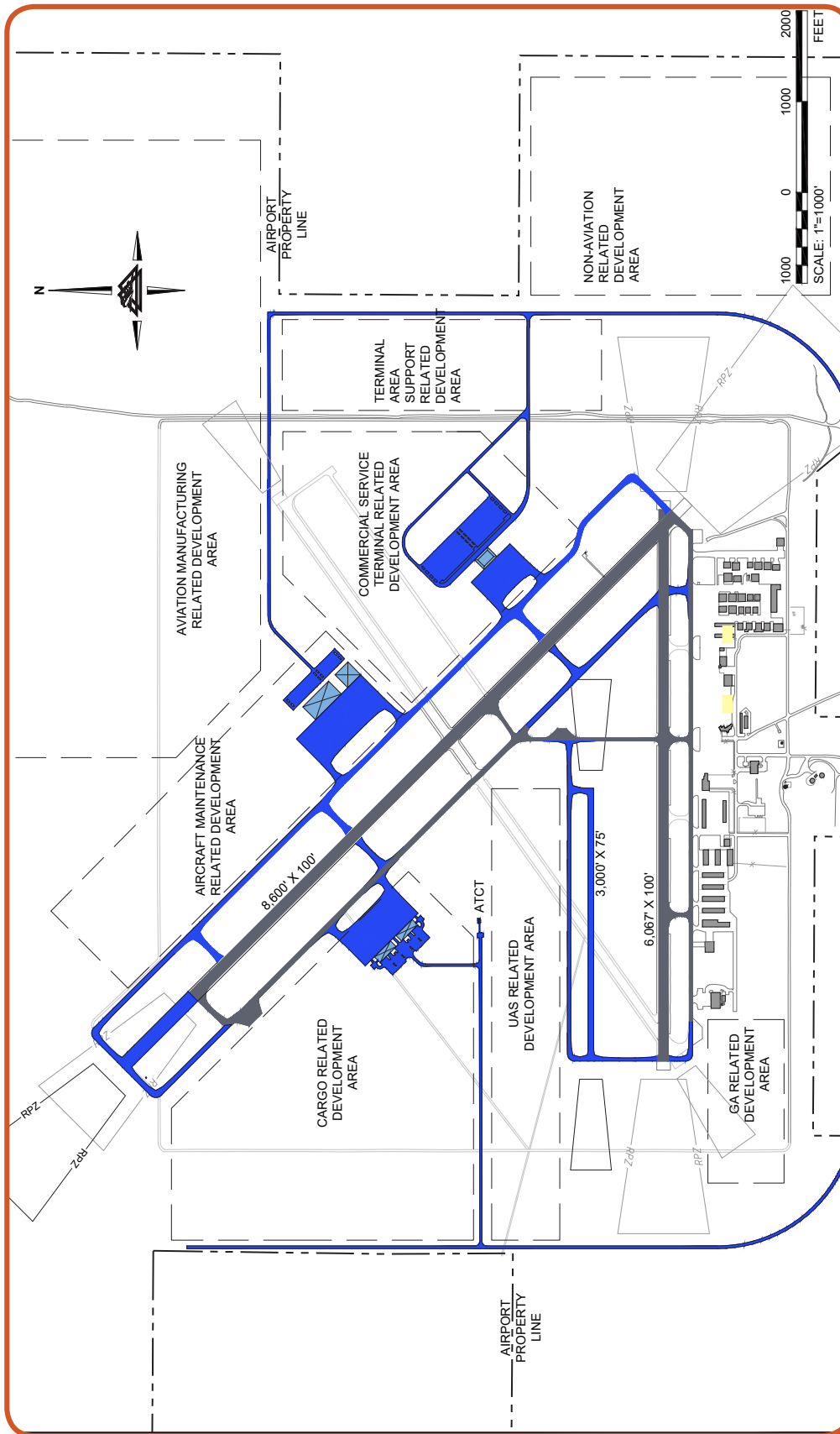
A detailed layout of Airfield Alternative One appears in **Figure 4-5**. Key features are listed below.

#### Key Features

- Provides for an extension of Runway 12-30 to 8,600 feet to meet forecast facility requirement needs.
- Permanently closes Runway 4-22.
- Provides for a short parallel runway to 8-26, to serve UAS needs.
- Reserves areas for ultimate (not anticipated within the 20-year planning period) development such as commercial service, major cargo operations, or aircraft maintenance facilities.
- Preserves siting for a future Airport Traffic Control Tower, consistent with siting studies done in previous planning studies.
- Uncouples the intersection of Runway 8-26 and Runway 12-30.

#### Assessment

- The future parallel runway does not provide any added capacity for aircraft operations and would solely be used for UAS operations.
- This Alternative does not provide for an extension to Runway 8-26 although local pilots have expressed the need for such an extension. They contend that wind conditions require frequent use of runway 8-26 and a longer runway would be helpful.
- Closes Runway 4-22 although local pilots and the City request this Runway remain open due to wind conditions, especially in the spring months. The other two runways provide at least 95 percent combined coverage on an annual basis, but winds do frequently favor Runway 4-22 for small aircraft.
- Extension to Runway 12-30 will meet the future operational needs of the airport.



**Figure 4-5. Airfield Alternative One**  
Source: Delta Airport Consultants, Inc.

## 4.4 | Part 02 - Airfield Alternative Two

A detailed layout of Airfield Alternative Two appears in **Figure 4-6**. Key features are listed below.

### Key features

- Provides for an extension of Runway 12-30 to 8,600 feet to meet forecast facility requirement needs.
- Provides for an extension to Runway 8-26 to 7,000 feet.
- Shortens Runway 4-22 to 3,000 feet on the west end of its current alignment.
- Reserves areas for ultimate (not anticipated within the 20-year planning period) development such as commercial service, major cargo operations, or aircraft maintenance facilities.
- Preserves siting for a future Airport Traffic Control Tower, consistent with siting studies done in previous planning studies.
- Uncouples the intersection of Runway 8-26 and Runway 12-30.

### Assessment

- The shortening of Runway 4-22 allows only for UAS operations and does not meet the desire of local pilots and the City to maintain this runway at a longer length for small aircraft use.
- Extension of Runway 12-30 to 8,600 will meet the future operational needs of the airport during the planning period.
- An extension to Runway 8-26 to 7,000 feet will help provide redundancy when Runway 12-30 is closed and will meet the expressed desire of local pilots for a longer Runway 8-26 when the wind conditions warrant use of this runway.

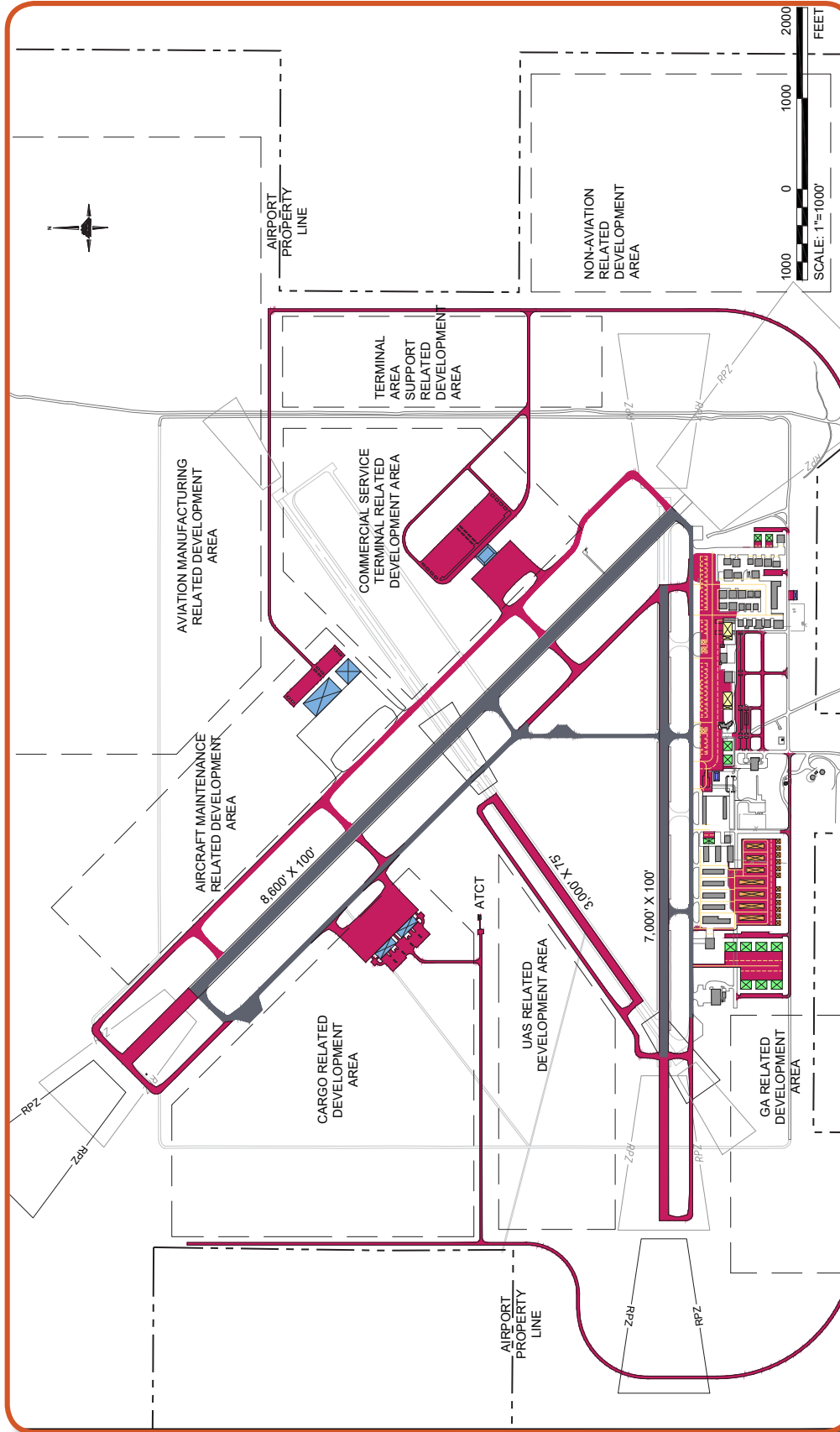


Figure 4-6. Airfield Alternative Two

Source: Delta Airport Consultants, Inc.

### 4.4 | Part 03 - Airfield Alternative Three

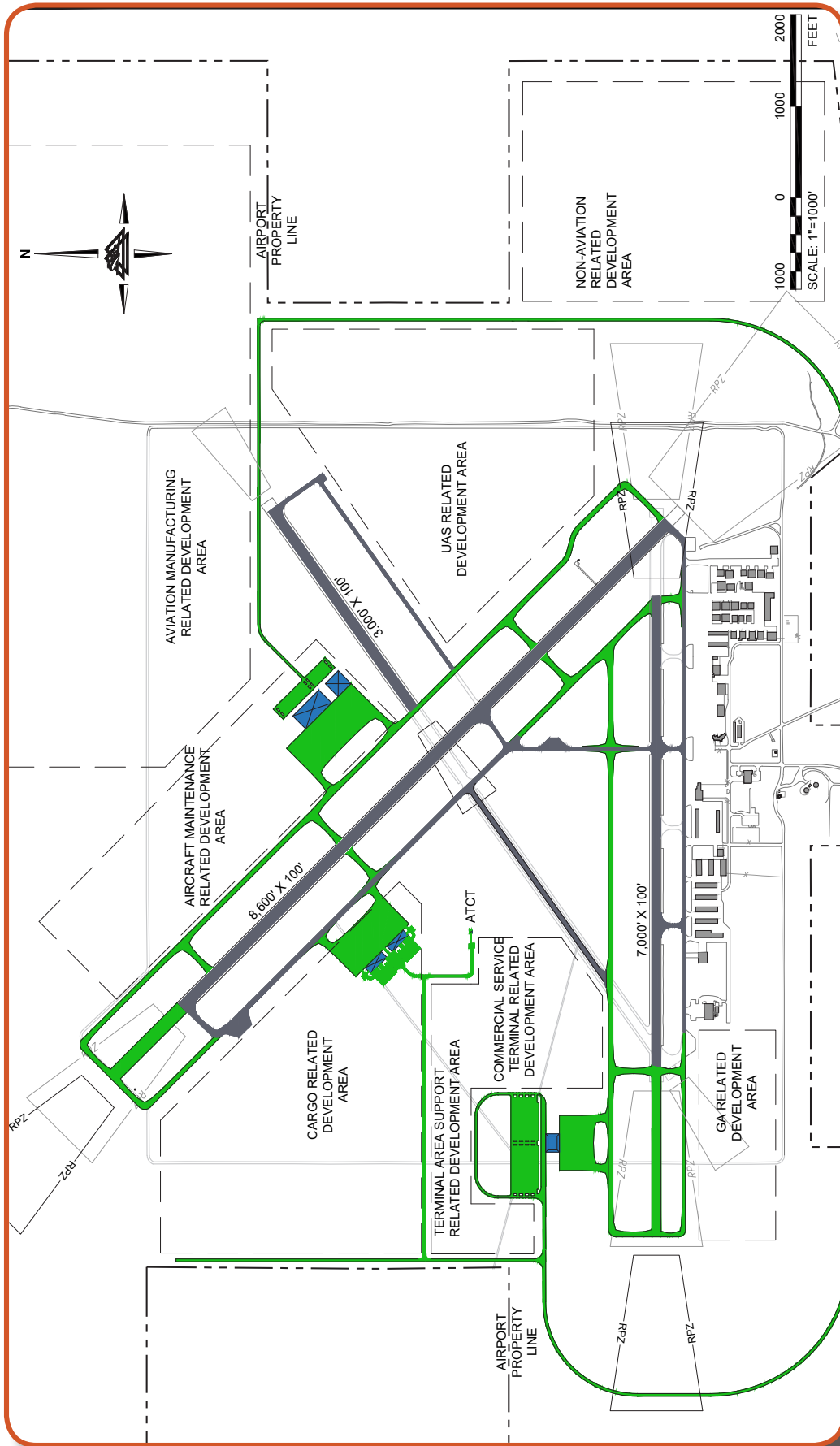
A detailed layout of Airfield Alternative Three appears in **Figure 4-7**. Key features are listed below.

#### Key features

- Provides for an extension of Runway 12-30 to 8,600 feet to meet forecast facility requirement needs.
- Provides for an extension to Runway 8-26 to 7,000 feet.
- Shortens Runway 4-22 to 3,000 feet on the east end of its current alignment.
- Reserves areas for ultimate (not anticipated within the 20-year planning period) development such as commercial service, major cargo operations, or aircraft maintenance facilities.
- Preserves siting for a future Airport Traffic Control Tower, consistent with siting studies done in previous planning studies.
- Uncouples the intersection of Runway 8-26 and Runway 12-30.

#### Assessment

- The shortening of Runway 4-22 allows only for UAS operations and does not meet the desire of local pilots and the City to maintain this runway at a longer length for small aircraft use.
- Extension of Runway 12-30 to 8,600 will meet the future operational needs of the airport during the planning period.
- An extension to Runway 8-26 to 7,000 feet will help provide redundancy when Runway 12-30 is closed and will meet the expressed desire of local pilots for a longer Runway 8-26 when the wind conditions warrant use of this runway.



**Figure 4-7. Airfield Alternative Three**  
Source: Delta Airport Consultants, Inc.

### 4.4|Part 04 - Preferred Airfield Alternative

A modified Alternative Two is the preferred Airfield layout. See **Figure 4-8**. Alternative Two was modified to show Runway 4-22 remaining open at its original length, but uncoupling its intersection with Runway 8 to improve safety. This results in a 6,750-foot Runway 4-22 and continues to provide for UAS operations on the north end of the Runway. This layout was accepted by City staff and the Advisory Board based on their review of the various layouts. It provides the most flexibility, meets airport geometric standards, provides for ultimate development beyond the 20-year planning period, is consistent with previous plans and the City’s past efforts to protect airspace, and requires no land acquisition.

The cost of the preferred airfield alternative is similar to the alternatives considered in that they all have similar major development planned. Estimated costs for major items of the preferred airfield are as follows.

**Table 4-1. Preferred Airfield Alternative Costs**

PROJECT	COST
Extend Runway 12-30 to 8,600 feet	\$4.8 million
Extend Runway 8-26 to 7,000 feet	\$4.0 million
Reconstruct Runway 4-22 (6,750 feet)	\$5.0 million
New taxiway system on west side of Runway 12-30 (ultimate development)	\$7.0 million
Road network (ultimate)	East side \$1.4 million West side \$1.2 million
Cargo/commercial/aircraft maintenance development (ultimate/conceptual layouts)	\$30-40 million each

Source: Delta Airport Consultants, Inc.

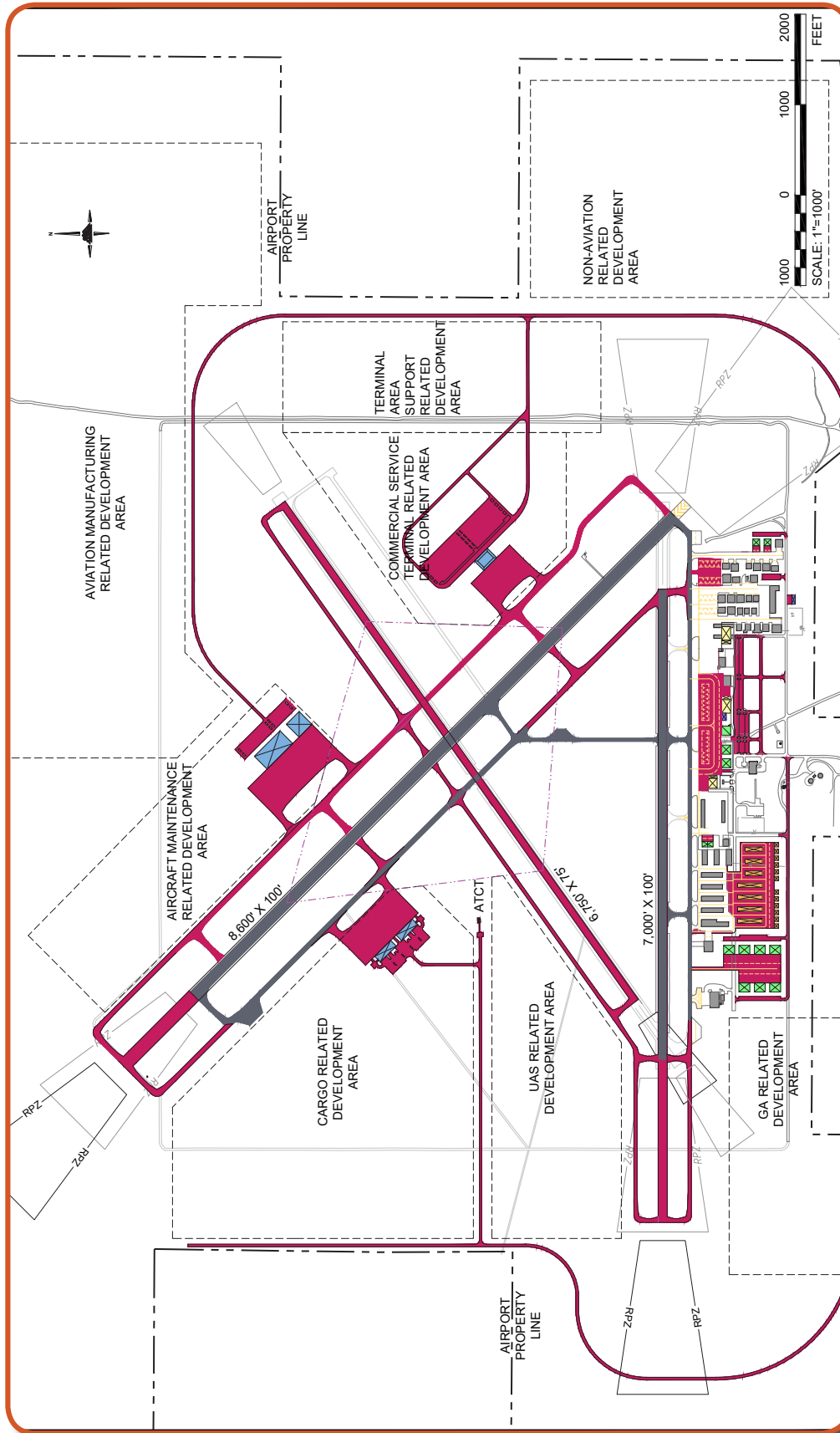
Ultimate development costs relate to development beyond the 20-year planning period.

As indicated earlier in this Chapter, environmental impacts of the development during the 20-year planning period are not expected to be significant. The only development that appears may require a formal environmental assessment is the extension to Runway 12-30, scheduled for Phase II (6-10 years). The purpose and need for this extension is to serve the existing and projected fleet mix of 75 percent of business jets and some University charter flights (e.g., Boeing 737-800) as indicated in Chapter 3 of the Action Plan.

Although not specified as a facility requirement for the 20-year planning period, the Airport Layout Plan documents will continue to identify possible longer runways and, therefore, the City will protect the airspace for a 10,600 Runway 12-30, and 8,600 feet for Runway 8-26. These are runway lengths that were previously proposed for Las Cruces in earlier master plans. The City has sufficient property for these lengths and, in fact, acquired property during a land swap for the future extension of Runway 12-30 beyond 10,000 feet.

Chapter 5 will provide recommendations for implementation and financing of the planned development.





**Figure 4-8. Preferred Airfield Alternative**

Source: Delta Airport Consultants, Inc.