CHAPTER FIVE: RECOMMENDED CONCEPT

5.1 Introduction

In the last chapter, airfield and landside development alternatives were assessed using a process that considered short and long term needs as well as future growth potential. Safety, both in the air and on the ground, was given high priority in the analyses and current airport design standards were considered in evaluating each scenario. Through meetings and discussions with the Yellowstone Regional Airport Board, the Planning Advisory Committee and staff, as well as the public, a recommended concept has evolved.

The recommended development concept for Yellowstone Regional Airport represents a means by which the airport can grow in a balanced manner to accommodate commercial and general aviation demand over the planning period. In addition, the plan provides the flexibility to meet activity growth beyond the long range planning horizon.

5.2 Airport Design Standards

Airport design and safety standards are primarily based on the characteristics of the critical design aircraft expected to use the airport. The critical design aircraft is the most demanding aircraft or "family" of aircraft which will conduct 500 or more operations (take-offs and landings) per year at the airport. The primary reference for the design of airfield facilities is FAA Advisory Circular 150/5300-13A, Airport Design. Within this advisory circular, a coding system, referred to as the Aircraft Approach Category (AAC) / Airplane Design Group (ADG) has been established that identifies an airport's critical design aircraft for each runway. This code is a function of the critical design aircraft's approach speed and wingspan. The AAC/ADG was previously discussed in Chapter Three.

The current AAC/ADG for air carrier Runway 4-22 at Yellowstone Regional Airport is C-II. This AAC/ADG is adequate for the current level of activity at the airport. Planning forecasts suggest that the runway should be planned for a future AAC/ADG of C-III. All airfield facilities associated with Runway 4-22, therefore, should ultimately comply with C-III design and safety standards. **Table 5-1** summarizes the planning standards used in the ultimate design and layout of Yellowstone Regional Airport.

Table 5-1 Airfield Planning Design Standards

	Runway 4-22
Airport Reference Code (ARC)	C-III
Runway 4-22	
Length	8,268′
Width	100′
Pavement Strength (lbs.)	124,000 D
Shoulder Width	20′
Runway Safety Area	
Width	500′
Length Beyond Runway End	1,000
Runway Object Free Area	
Width	800′
Length Beyond Runway End	1000′
Runway Obstacle Free Zone	
Width	400′
Length Beyond Runway End	200′
Centerline to:	
Holding Position	293′
Parallel Taxiway	400′
Edge of Aircraft Parking	500′
Taxiways	
Taxiway Design Group (TDG)	4
Width	50′
Shoulder	20′
Object Free Area	
Width	186′
Taxiway Safety Area	
Width	118′
Taxiway centerline to	
Fixed or Movable Object	93′

5.3 Master Plan Concept

The recommended master plan concept, as depicted on **Figure 5-4,** proposes the following elements as outlined in the previously proposed planning alternatives:

- Preserve ability to ultimately extend Runway 4-22 by maintaining clearances and airspace zoning.
- Remove or shift Taxiway A-1 to reduce direct access from the apron to the runway.
- Consider adding holding aprons or bypass taxiways to serve the existing runway system.
- Extend taxiways / taxilanes into general aviation development areas.
- Pursue instrument approach improvements to Runway 4 and Runway 22 in coordination with FAA flight procedures. Continue to preserve clearances for potential approach upgrades.
- Terminal parking expansion.
- Terminal holdroom expansion.
- Expand terminal airline office space.
- Expand baggage claim frontage and lobby area.
- Expand secure and non-secure side concessions.
- Add secure and non-secure side restroom space.
- Expand commercial, general aviation and corporate aprons.
- Provide for construction of additional aircraft storage hangars
- Provide potential location for segregated air cargo operation.

The recommended master plan concept provides for anticipated aviation facility needs for the Cody area throughout the 20-year planning horizon. The following sections provide a brief discussion of the major improvements planned for the airport throughout the planning period.

5.4 Airside Recommendations

Airside recommendations include improvements to the runway, new taxiway construction, and airfield lighting. These improvements are summarized as follows:

Runway 4-22

Runway 4-22 is the primary runway with a length of 8,268 feet and a width of 100 feet. As shown in **Figure 5-4**, the master plan recommends maintaining Runway 4-22 at its current length of 8,268 for the planning horizon. The ability to ultimately extend the runway will be preserved by protecting future approach and departure clearances. Runway pavement strength is planned to be maintained at its current level of 95,000 pounds single wheel loading (SWL), 124,000 pounds dual wheel loading (DWL) and 193,000 pounds dual tandem gear loading (DTG). The approaches to Runway 4-22 should be protected in accordance with precision approach geometry to allow for the

development of a precision approach in the future.

Taxiways

The taxilane which serves general aviation hangars southeast of the general aviation apron will be extended east to serve future hangars. A new taxilane to serve executive hangars, t-hangars and a new general aviation tiedown apron is planned to extend from the north edge of general aviation apron to the east.

Holding aprons are planned near both runway ends to allow aircraft to bypass other aircraft when needed.

The general aviation apron connecting taxiway will be removed to eliminate the direct taxi route from the aprons to the Runway. This is to reduce the potential for runway incursions. Taxiway improvements are summarized in **Figure 5-3** and **5-4**.

Instrument Approaches, Airfield Lighting/ Visual Approach Aids

Following the establishment of a straight in RNAV GPS approach to Runway 4 The airport will continue to pursue incremental improvements to instrument approaches to Runway 4 and Runway 22 in coordination with FAA flight procedures. These improvements may include:

- ILS (localizer & glideslope)
- Localizer only
- Approach Lighting (MALSF/MALSR),
- Incremental procedural modifications

Clearances for the approaches to both runways should continue to be preserved in anticipation of the ultimate development of full precision approaches.

Visual approach aids will be maintained and replaced as they near the end of their useful life.

5.5 Landside Recommendations

Landside recommendations include the passenger terminal, aircraft parking aprons and tiedown areas and aircraft storage hangar facilities. Planned improvements to landside facilities are summarized as follows:

Passenger Terminal

Chapter 3, Facility Requirements evaluated each of the functional areas of the terminal against current and future demand requirements. Future needs were determined based on peak hour requirements. Airline schedules at the Yellowstone Regional Airport are currently transitioning from staggered departures to multiple overlapping departures. In addition, forecasts indicate that the critical aircraft will transition from 50 seat capacity regional jets to larger 70 and 90 seat regional jets.

The combination of overlapping airline schedules and larger passenger capacity aircraft results in peak hour passenger loads which exceed capacity for certain functional areas of the terminal in both the immediate term and in the long term planning horizon.

The preferred passenger terminal layout is shown on **Figure 5-1**. As regional carriers utilize multiple gates simultaneously and transition to larger aircraft carrying more passengers, the terminal holdroom will be expanded into the existing non-secure restaurant and, ultimately into the existing airport administration office space. Initial phases of this expansion should occur in the short term as upcoming airline schedules

indicate 2-3 overlapping regular morning departures. As increased security requirements cause passengers to increase time spent on the secure side, secure holdroom amenities have become a greater priority. The central kitchen will be remodeled to allow service to both secure and non-secure side concessions. In addition, restrooms will be added to the secure side to accommodate peak period demand.

Expansion of the building to the southwest will accommodate increased baggage claim area for more departing passengers to accommodate larger aircraft with greater passenger loads. In addition, building expansion will accommodate replacement of administrative space displaced by holdroom expansion, as well as additional secure and non-secure side restrooms. Expansion to the northeast is planned to provide the ability to increase airline ticketing and office space needs as well as baggage makeup in the event additional airlines enter the Cody market in the intermediate or long term.

Plans are phased to accomplish remodeling and expansion incrementally as needed according to demand.

The terminal parking lots will be expanded to accommodate increasing parking demands.

A conceptual layout for the long term expansion of the existing terminal building to provide additional gates, baggage claim, secure and non-secure side concessions space is provided in **Figure 5-1**, with a commercial apron parking layout shown on **Figure 5-2**. Expansion of terminal auto parking areas is shown in the preferred landside alternatives depicted in **Figure 5-3**.

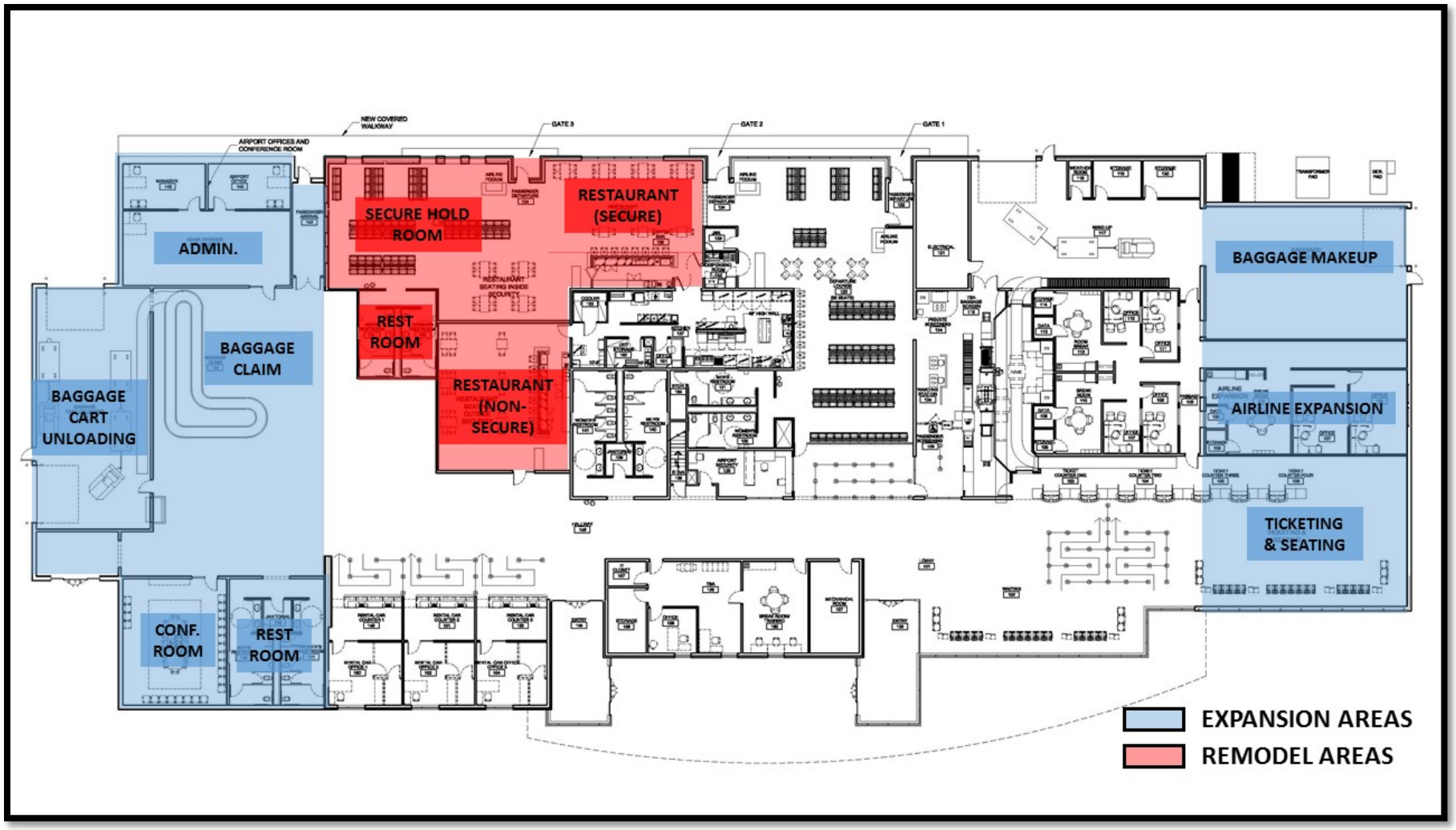

Figure 5-1: Preferred Conceptual Terminal Layout

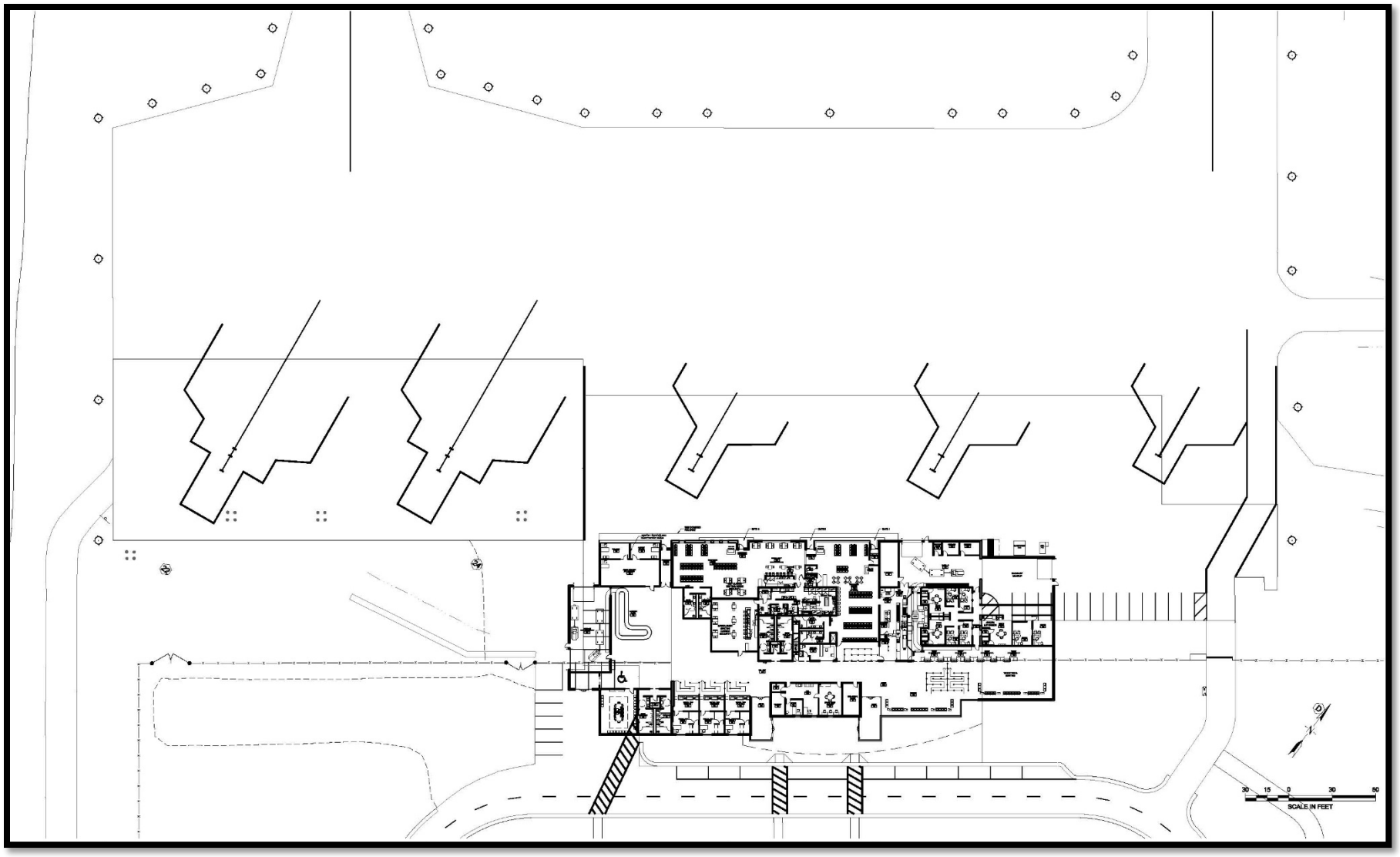

Figure 5-2 Preferred Terminal Apron Layout

Air Traffic Control Tower

In pursuance of a future Air Traffic Control Tower (ATCT), the Yellowstone Regional Airport will discuss the potential for participation in the FCT Air traffic control tower program with the FAA. Likewise, the Airport will continue to monitor the progress and feasibility of Remote Virtual Tower systems as an alternative.

Aircraft Parking Apron/Tiedown Area

As shown in **Figure 5-3**, aprons serving commercial, general aviation and corporate aircraft will be constructed and expanded as needed. Area along the commercial apron will be reserved to accommodate larger aircraft, remain overnight (RON) commercial aircraft parking and deicing operations.

Aircraft Storage Hangar Facilities

To accommodate the need for additional storage positions, for both small and large aircraft, the existing primary hangar areas will be expanded to the north and west of the current hangar area with a mixture of small general aviation and large executive hangars as shown in **Figure 5-3**.

A future fuel farm is also planned in the southwest corner of the development area which could serve as the location for a future FBO or GA terminal.

5.6 Recommended Master Plan Concept

Figure 5-4 presents an overview of projects recommended for implementation within the master planning period to accommodate the previously identified requirements for airport facilities.

5.7 Airport Layout Plan

From this concept, the airport's Airport Layout Plan set will be updated to depict the planned improvements to the airfield and terminal area. This set of plans includes:

- Airport Layout Drawing
- Part 77 Airport Airspace Drawings
- Inner Approach Surfaces and Profiles Plans
- Terminal Layout Plan
- Departure Surfaces Plans
- Airport Property Map
- Land Use Plan

The airport layout plan set has been updated on a computer aided drafting system for future ease of use. The computerized plan set provides detailed information on existing and future facility layout on multiple layers that permit the user to focus on any section of the airport at any desired scale. The plan can be used as base information for design and can easily be updated in the future to reflect new development and more detail concerning existing conditions as made available through design surveys. The following is a description of the sheets in the airport layout plan set:

Airport Layout Drawing

The Airport Layout Drawing (ALP) graphically presents the existing and the ultimate airport layout. It depicts the recommended improvements which will enable the airport to meet forecast aviation demand. The ALP also shows areas of land acquisition to meet development standards and other requirements. Detailed airport and runway data are provided on the ALP to facilitate the interpretation of the master planning recommendation.

Part 77 Airport Airspace Drawings

The airspace plan for Yellowstone Regional Airport is based on Federal Aviation Regulations (F.A.R) Part 77 Objects Affecting Navigable Airspace. In order to protect the airspace and approaches to each runway from hazards which would affect the safe and efficient operation of the airport, federal criteria has been established (F.A.R. Part 77 for use by local planning and land use jurisdictions to control the height of objects in the vicinity of the airport.

The F.A.R. Part 77 Airspace Plan drawing is also used to indicate obstructions which are located within the imaginary surfaces applicable to Yellowstone Regional Airport. The Part 77 Airspace Plan assigns three-dimensional imaginary areas to the runway. These imaginary surfaces emanate from the runway centerline and are dimensioned to protect approaching and departing aircraft from the potential hazard of obstructions. The plan depicts the critical surfaces for a precision instrument approach to Runway 22 as well as a non-precision instrument approach to Runway 4. The Part 77 imaginary surfaces include the primary surface, approach surface, transitional surface, horizontal surface and conical surface.

Inner Approach Surfaces and Profile Plans

The Runway Protection Zones (RPZ) are depicted on the Inner Approach Surface Drawings. These drawings consist of a large scale plan and profile view of the inner portion of the runway approach surfaces. This plan facilitates identification of obstructions, roadways and buildings that lie within the confines of the critical approach area located off the end of each runway.

Terminal Layout Plan

The Terminal Layout Plan represents the planned development configuration of future landside facilities at Yellowstone Regional Airport. Existing facilities and future facilities required to meet anticipated demand are shown.

Departure Surfaces Plans

Departure Surfaces Plans provide a profile representation of the departure surfaces of each runway end. The drawings depict the physical features in the vicinity of each runway end including topographic changes, roadways, drainage ditches and trees.

Airport Property Map

The primary purpose of the Airport Property Map is to provide information on the acquisition and identification of all land tracts for analyzing the current and future aeronautical use of land acquired with federal funds. Existing and future airport features (i.e. runways, taxiways, apron, runway protection zones, hangars, terminal facilities, etc.) are depicted which indicate the aeronautical need for existing and future property limits. The plan indicates how various tracts of land were acquired (i.e. Federal funds, surplus property local funds only, etc.) Also shown on this plan are easement interests in areas outside the fee property line.

Land Use Plan

The objective of the Airport Land Use Plan is to coordinate uses of the airport property in a manner which is functional with the design of the airport and compatible with the airport environs. Therefore, both on and off airport land uses are presented on this plan. In addition, noise exposure contours are

overlaid to depict compatibility of the airport operations with the airport environs.

On Airport Land Use

Airport land use planning is important for the orderly development and efficient use of available space. There are two primary considerations for on-airport land use planning. These are, first, to secure those areas essential to the safe and efficient operation of the airport; and, second, to determine compatible land uses for the balance of the property which would be most advantageous to the airport and community. The plan depicts the recommendations for ultimate land use development on the airport. When development is proposed it should be directed to the appropriate land use area depicted on this plan. Several on-airport land use categories have been identified including:

- Operational Area
- General Aviation
- Short Term General Aviation
- Terminal Area
- Aviation Related Development

Off Airport Land Use

The airport land use plan typically depicts surrounding land uses in relation to the airport that are within the 65 DNL noise exposure contour. At Yellowstone Regional Airport, the 65 DNL noise contour remains largely on airport property throughout the planning period.

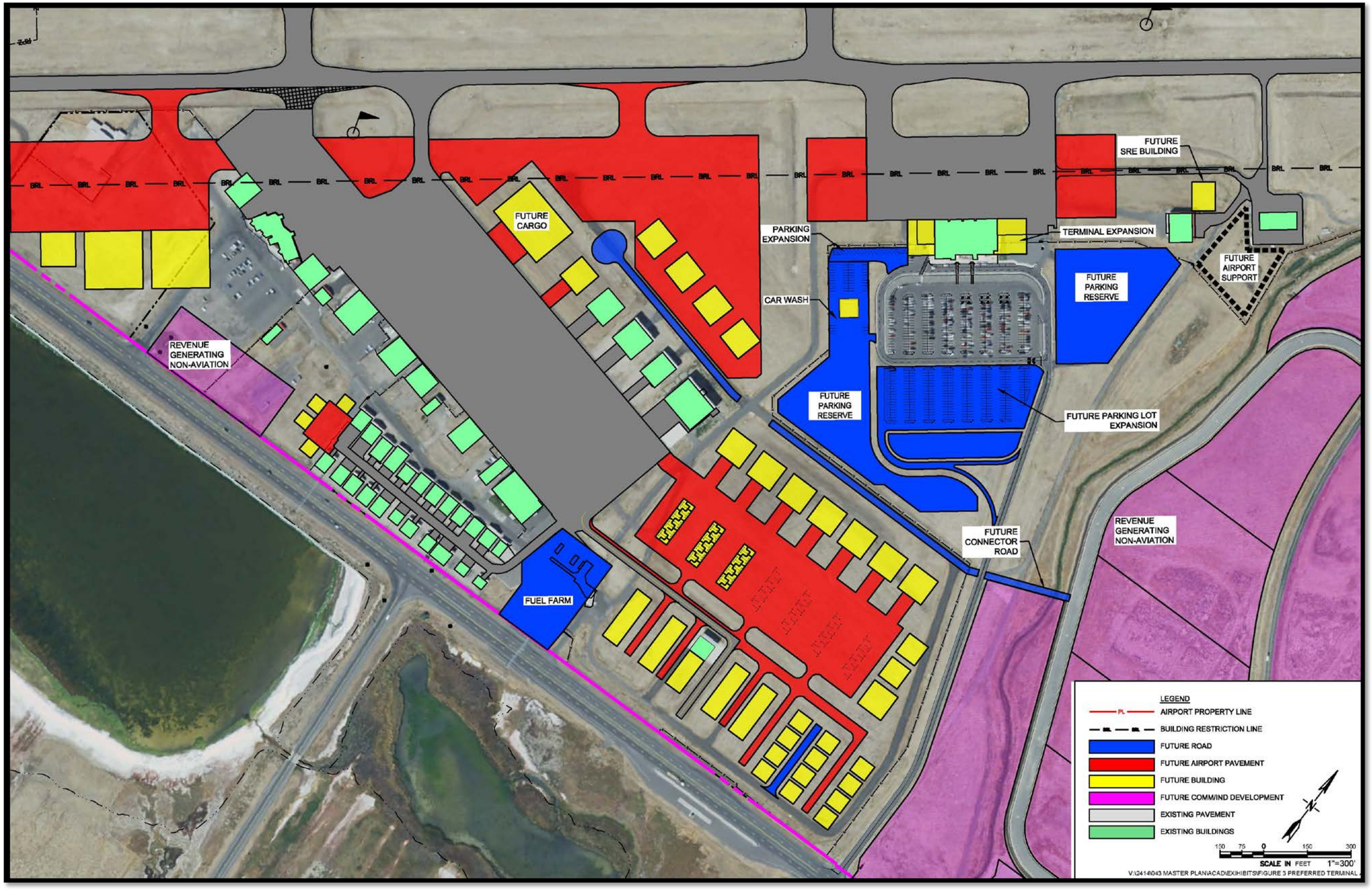

Figure 5-3: Preferred Landside Development Plan

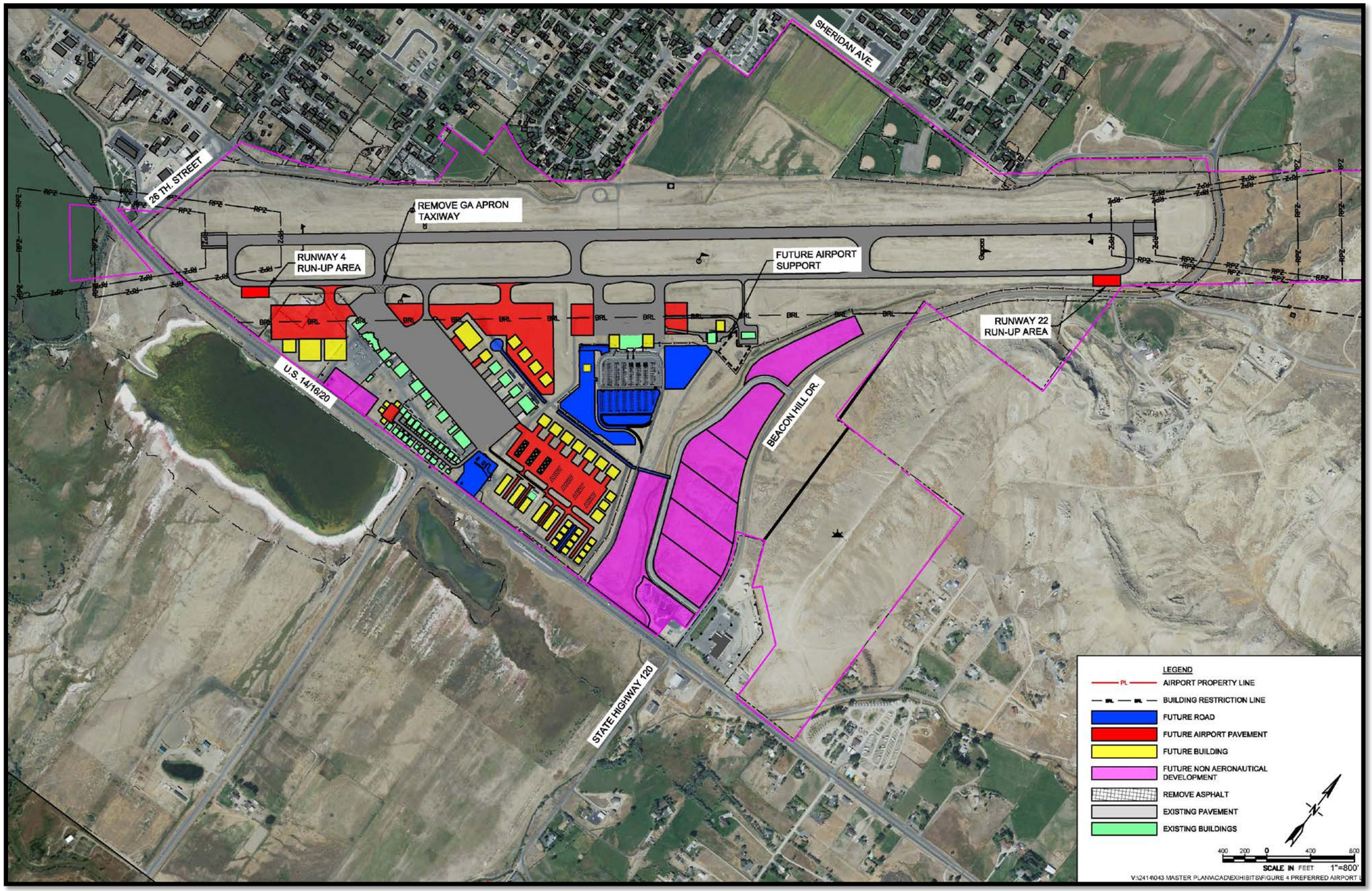

Figure 5-4: Recommended Master Plan Concept