Chapter 5: Alternative Analysis

Introduction

This chapter of the Airport Master Plan discusses airport development alternatives considered in the planning process for the Rapid City Regional Airport (RAP). Alternatives evaluated for this study are based on comparing existing conditions with facility requirements determined from the activity forecast reviewed in detail in the previous chapters. Alternatives found to be reasonable to accommodate the short and long-term needs are identified. Potential impacts of each alternative considered are discussed and used to help the airport select a preferred alternative(s). Alternatives outlined are split into functional facility areas:

- Airfield
- Passenger Terminal
- General Aviation & Other
- Landside
- Support Facilities

A Preferred Development Strategy based on the preferred alternatives is identified at the conclusion of the alternatives analysis. This preliminary plan provides a guideline for implementation based on identified needs and priorities. The plan to implement the preferred alternative is reviewed in more detail in **Chapter 6: Implementation Plan**.

Evaluation Process

The overall guiding principle is to provide an airport facility that adequately serves the community needs and is flexible to industry changes. Alternatives must meet FAA design criteria and be implementable with the existing infrastructure and environment. A wide range of alternatives were evaluated to determine the best solution for the airport to meet anticipated needs identified by Planning Activity Level (PAL), which were described in Chapter 4.

The alternative evaluation process includes identifying, evaluating and finally selecting. Concepts were first prepared based on buildable solutions to meet demand within the developable areas of the airport. Next, these concepts were evaluated by airport management for their ability to realistically meet the demands along with impacts. Criteria used to evaluate alternatives include operational performance, best planning tenets, environmental and fiscal factors. The concepts were narrowed to three Refined Alternatives which were provided to Focus Group members (March 2015) and the Rapid City Regional Airport Board (March 24, 2015). No weighting factors were used for evaluation as they could have skewed the results.

The alternatives were reviewed and refined with feedback from airport management and airport focus groups. All costs for the three refined Alternatives were planning-level estimates in 2015 dollars. Alternatives from one facility area may also have an impact on another facility area so these factors were also considered when compiling one preferred airport development alternative. The Rapid City Regional Airport Board reviewed three refined alternatives at a workshop on March 24, 2015. The preferred alternative was approved by the Rapid City Regional Airport Board on April 14, 2015.

Development Considerations

Each functional area of the airport has specific needs and constraints that affect the formulation of realistic, implementable development alternatives. These are discussed in detail within this Chapter; an overarching consideration at Rapid City is the airport's role in meeting the aviation needs in the region.

Airfield Development Alternatives

The Airfield Development Alternatives reviewed the following infrastructure elements:

- Runway
- Taxiway System
- Airport Traffic Control Tower

Requirements Summary

The airfield is vital to the airport's core infrastructure to accommodate aircraft operations. The following section summarizes key airfield facility requirement findings:

- **The Airbus A319, Bombardier Q400 and Boeing B717 aircraft types (ARC C-III, TDG-4) are expected to remain the critical design aircraft through PAL 4.**
- **No runway extension or configuration modifications to air carrier runway ends are needed to meet length and capacity needs based on forecasted operations.**
- **Enhancements to Runway 14 approach procedures to increase airport operational utility in instrument meteorological conditions should be pursued.**
- **Targeted runway improvements include the Runway 32 blast pad and paved shoulders for Runway 14-32 are needed to meet current design standards.**

Runways

An evaluation of development alternatives to accommodate the airfield facility requirements for each of the Rapid City's runways is described in the following section.

Configuration

Runway 14-32, the 8,701 foot long primary runway, is of sufficient length, width and strength to accommodate regular use of the design aircraft with ARC C-III standards without major restrictions. Runway 5-23, the 3,601 foot long crosswind runway, is identified to serve aircraft with ARC A-I (small) standards and is of sufficient length, width and strength to accommodate this through the planning period. Therefore no alternatives for runway alignment, width, length or strength were evaluated.

Constructing 25-foot wide paved shoulders along the sides of runway 14-32 and upgrading the Runway 32 blast pad for the current runway configuration is a targeted improvement to meet FAA design standards.

Approaches

Recommended improvements include upgrading the Runway 14 approach to a Category I Precision Instrument approach to achieve lower weather minima which increases airport utility. No alternatives were examined for this improvement and the upgrading of the Runway 14 approach to a Category I Precision Instrument approach is included in the preferred alternative.

Land Use

FAA land use standards should be met for all runways. The FAA recently introduced guidance which changed the uses of property within the Runway Protection Zones (RPZ). With the improvement to the approach for Runway 14, the RPZ would increase resulting in a requirement for the airport to remove incompatible uses which for Rapid City is Long View Road. No alternatives were examined for this improvement and the realignment of Long View Road is included in the preferred alternative. See **Exhibit 5-4 Preferred Alternative**.

Table 5-1 –Runway Recommendations

Runway(s)	Improvement
14-32	25’ Paved Runway Shoulder
32	200’ x 200’ Paved Blast Pad
14	Cat I Precision Instrument Approach
14	Realign Long View Road outside of RPZ
14-32 & 5-23	Replace PAPI’s

Source: KLJ Analysis

Taxiway System

An evaluation of development alternatives for the Rapid City taxiway system is described below.

Taxiway A

The airport recently completed a series of projects which realigned all of Taxiway A so that the taxiway is correctly separated from Runway 14-32. As a result of this work, there is no additional work needed to improve Taxiway A and its associated connectors to Runway 14-32.

Taxiway B

Taxiway B is a full parallel taxiway for Runway 5-23. This is sufficient to meet the needs of Runway 5-23 and no additional improvements for this taxiway are recommended in the planning period.

East Parallel Taxiway

The current centerline separation from Taxiway A to Runway 14-32 is 450'. This is sufficient separation to function as a temporary runway expect for two specific constraints. The constraints are as follows:

1. Existing buildings would impede Taxiway A's use as a runway; and
2. The existing gradient does not meet the requirements for a runway.

A runway for Design Group C aircraft require a maximum gradient of ±0.80% for the first and last quarter of the runway and maximum gradient of ±1.00% per 1000'. In two areas that were examined, these requirements exceeded with -0.84% for the first/last quarter of the runway and by 1.04% and -1.23% per 1000' in two other areas.

The constraints of Taxiway A to function as a temporary runway is one reason that a parallel taxiway on the east side of Runway 14-32 was examined. The other reason is the limited space available on the west side of the airport and a recognition that in the long term, development may need to be expanded to the east side. A full parallel taxiway would be necessary for this. Alternatives were developed with and without the full parallel east taxiway as can be identified in **Exhibit 5-1 Alternative 1**, **Exhibit 5-2 Alternative 2** and **Exhibit 5-3 Alternative 3**. An estimate of costs were developed for each alternative and are found in **Table 5-3 Alternative 1 Estimated Costs**, **Table 5-4 Alternative 2 Estimated Costs**, and **Table 5-5 Alternative 3 Estimated Costs**. The preferred alternative was determined to include the east parallel taxiway which was incorporated from Alternative 3. For the Preferred Alternative map and estimated costs see **Exhibit 5-4 Preferred Alternative** and **Table 5-6 Preferred Alternative Estimated Costs**.

Targeted Improvements

Targeted improvements are those that are recommended to meet airport design standards and have limited alternatives.

Correcting Direct Access

Direct access from an apron to a runway should be corrected per FAA airport design standards to reduce the risk of runway incursions. Taxiway B and B1 from the north end of the general aviation apron provide direct access to Runway 14-32 and Runway 5 respectively.

Table 5-2 – Taxiway Recommendations

Taxiway(s)	Improvement
East Parallel	TDG 4 with ability to function as a temporary runway
B	Remove Direct Access to Runway 14-32
B1	Remove Direct Access to Runway 5

Source: KLJ Analysis

Exhibit 5-1 Alternative 1

Table 5-3 –Alternative 1 Estimated Costs

Cost Estimates for Alternative 1 (000's)					
Area	**Description**	**Paving**	**Buildings**	**Other**	**Total**
Main Apron	Apron Paving and Hangars	$ 1,017.0	$ 2,576.0		$ 3,593.0
North Hangar	Hangars and Associated Paving	$ 889.0	$ 2,448.1		$ 3,337.1
Middle Hangar	Hangars and Associated Paving	$ 1,779.0	$ 6,044.2		$ 7,823.2
South Large Hangar	Hangars and Associated Paving	$ 758.3	$ 1,904.0		$ 2,662.3
Terminal	Apron Paving	$ 708.2			$ 708.2
Cargo/CBP	Buildings and Associated Paving	$ 408.0	$ 980.0		$ 1,388.0
Deicing	Paving	$ 1,288.0			$ 1,288.0
USFS	Paving and Associated Fill	$ 3,268.5		$ 1,442.0	$ 4,710.5
ATCT	Building and Associated Paving	$ 63.0	$ 3,450.0		$ 3,513.0
Parking	Paving and Associated Fill	$ 501.6	$ 7,820.0	$ 828.0	$ 9,149.6
SRE Building	Building and Associated Paving	$ 521.3	$ 8,964.5		$ 9,485.8
Roads	New Roads in GA Area and Long View Realignment	$ 1,868.1		$ 1,381.0	$ 3,249.1
	Total	$ 13,184.0	$ 34,472.8	$ 3,651.0	$ 51,307.8

Exhibit 5-2 Alternative 2

Table 5-4 –Alternative 2 Estimated Costs

Cost Estimates for Alternative 2 (000's)					
Area	**Description**	**Paving**	**Buildings**	**Other**	**Total**
Main Apron	Apron Paving and Hangars	$ 1,017.0	$ 3,381.0		$ 4,398.0
North Hangar	Hangars and Associated Paving	$ 889.0	$ 2,448.1		$ 3,337.1
Middle Hangar	Hangars and Associated Paving	$ 1,779.0	$ 6,561.8		$ 8,340.8
South Large Hangar	Hangars and Associated Paving	$ 872.3	$ 2,190.0		$ 3,062.3
Terminal	Apron Paving	$ 708.2			$ 708.2
Cargo/CBP	Buildings and Associated Paving[1]	$ 569.0	$ 1,495.0		$ 2,064.0
Deicing	Paving	$ 1,318.7			$ 1,318.7
USFS	Paving and Associated Fill	$ 3,268.5		$ 1,442.0	$ 4,710.5
ATCT	Building and Associated Paving	$ 63.0	$ 3,450.0		$ 3,513.0
Parking	Paving and Associated Fill	$ 383.9	$ 6,555.0	$ 643.0	$ 7,581.9
SRE Building	Building and Associated Paving	$ 521.3	$ 8,964.5		$ 9,485.8
Roads	New Roads in GA Area and Long View Realignment	$ 1,729.1		$ 1,381.0	$ 3,110.1
	Total	$ 13,119.0	$ 35,045.4	$ 3,446.0	$ 51,630.4

[1] The Cargo area will make use of a portion of the 8,000 square yards of apron being added in this area in 2015.

Exhibit 5-3 Alternative 3

Table 5-5 –Alternative 3 Estimated Costs

Cost Estimates for Alternative 3 (000's)					
Area	**Description**	**Paving**	**Buildings**	**Other**	**Total**
Main Apron	Apron Paving and Hangars	$ 1,017.0	$ 3,381.0		$ 4,398.0
North Hangar	Hangars and Associated Paving	$ 889.0	$ 2,448.1		$ 3,337.1
Middle Hangar	Hangars and Associated Paving	$ 569.0	$ 2,448.1		$ 2,785.8
South Large Hangar	Hangars and Associated Paving	$ 506.0	$ 3,091.0		$ 3,597.0
East Main Apron	Apron Paving, Hangars and Utility Extensions	$ 6,073.3	$ 7,921.0	$ 1,847.7	$ 15,842.0
East Small Hangar	Hangars and Associated Paving	$ 1,104.1	$ 6,640.3		$ 7,744.4
East Taxiway	Paving	$ 21,435.5			$ 21,435.5
Cargo/CBP	Apron Paving, Fill and Buildings	$ 774.7	$ 1,325.0	$ 551.2	$ 2,650.9
Deicing	Paving	$ 3,480.7			$ 3,480.7
USFS	Paving and Associated Fill	$ 3,330.3	$ 460.0	$ 1,520.5	$ 5,310.8
ATCT	Building and Associated Paving	$ 63.0	$ 3,450.0		$ 3,513.0
Roads	New Roads in GA Areas and Long View Realignment	$ 2,231.8		$ 978.0	$ 3,209.8
	Total	$ 41,474.4	$ 30,933.2	$ 4,897.4	$ 77,305.0

Exhibit 5-4 Preferred Alternative

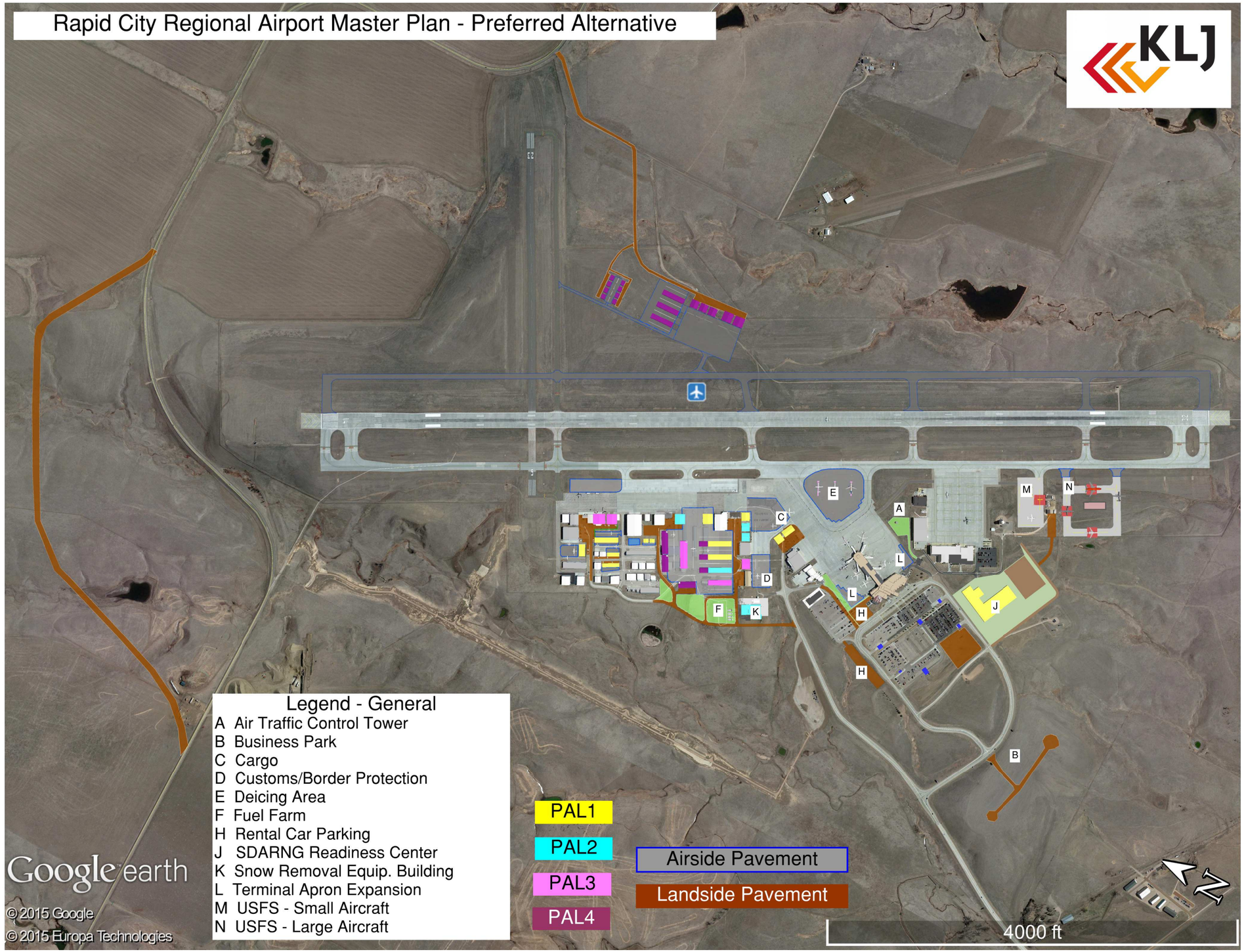


Table 5-6 – Preferred Alternative Estimated Costs

Cost Estimates for Preferred Alternative (000's)					
Area	**Description**	**Paving**	**Buildings**	**Other**	**Total**
Main Apron	Apron Paving and Hangars	$ 1,017.0	$ 3,381.0		$ 4,398.0
North Hangar	Hangars and Associated Paving	$ 889.0	$ 2,448.1		$ 3,337.1
Middle Hangar	Hangars and Associated Paving	$ 1,779.0	$ 6,561.8		$ 8,340.8
South Large Hangar	Hangars and Associated Paving	$ 872.3	$ 2,190.0		$ 3,062.8
East Main Apron	Apron Paving, Hangars and Utility Extensions	$ 3,152.3	$ 3,156.0	$ 1,807.7	$ 8,116.0
East Small Hangar	Hangars and Associated Paving	$ 750.2	$ 3,320.2		$ 4,070.4
East Taxiway	Paving	$ 21,435.5			$ 21,435.5
Terminal	Apron Paving	$ 708.2			$ 708.2
Cargo/CBP	Apron Paving[2], Fill and Buildings	$ 569.0	$ 1,495.0		$ 2,064.0
Deicing	Paving	$ 3,480.7			$ 3,480.7
USFS	Paving and Associated Fill	$ 3,268.5		$ 1,442.0	$ 4,710.5
ATCT	Building and Associated Paving	$ 63.0	$ 3,450.0		$ 3,513.0
Parking	Paving and Associated Fill	$ 868.6	$ 138.0	$ 828.0	$ 1,834.6
SRE Building	Building and Associated Paving	$ 521.3	$ 8,964.5		$ 9,485.8
Roads	New Roads in GA Areas and Long View Realignment	$ 2,730.1		$ 1,841.0	$ 4,571.1
	Total	$ 42,104.7	$ 35,104.6	$ 5,918.7	$ 83,128.0

[2] The Cargo area will make use of a portion of the 8,000 square yards of apron being added in this area in 2015.

Airport Traffic Control Tower

The airport is responsible in cooperation with the FAA for siting, constructing and maintaining an Airport Traffic Control Tower (ATCT) for an airport. The airport, through this master plan study, is evaluating potential sites to identify land so that future ATCT sites remain feasible.

The existing ATCT facility may or may not be maintained at the current site. No significant improvements have been made with the ATCT facility other than maintenance since its original construction in 1964. The current facility has limited line-of-sight to Runway 23, portions of the airline terminal apron and Taxiways T2 and T1. The ATCT is also situated between the SDARNG and USFS installations.

Alternative 0: Existing ATCT Complex

Future development at the current site should be considered. In the future a new ATCT could be developed near the existing ATCT. A taller tower may be able to correct the issues with the current facility. Using the existing area will not provide any room for expansion for either the SDARNG or USFS. Also a temporary tower would need to be constructed in order to ensure air traffic oversight during the construction of the new ATCT.

Alternative 1: North of Airline Terminal within General Aviation Area

A site in this area would be adjacent to the old airline terminal that was removed in 2014. The site is identified on **Exhibit 5-1 Alternative 1**. This site provides a very good view of the entire airport but would use a portion of the General Aviation area which in Alternative 2 is used for Air Cargo.

Alternative 2: Between Airline Terminal and SDARNG

A site in this area would be between the Airline Terminal and the SDARNG facility. The site is identified on **Exhibit 5-2 Alternative 2**. Landside access would be a narrow drive from an existing employee parking area. There have been no identified uses for this area as it is a triangular remnant that is otherwise unusable but with very good airfield visibility.

Alternative 3: Remote East Site

With the development on the east side of the airfield a location for an ATCT was identified here. The site is identified on **Exhibit 5-3 Alternative 3**. The site would have very good visibility. As with all other development on the east side, all utilities will need to be extended to allow for the ATCT facility.

Preferred Alternative

The preferred alternative is Alternative 2. This alternatives best utilizes available space and meets facility requirements. It is depicted in **Exhibit 5-4 Preferred Alternative**.

Table 5-7 – Airport Traffic Control Tower Alternative Summary

Alternative	Actions	Strengths	Weaknesses
0	New ATCT in Existing Area	• Can more easily connect to existing infrastructure	• Site within constrained area between SDARNG and USFS areas • Requires higher tower to clear most line of sight issues
1	New ATCT North of Airline Terminal in GA Area	• Central location • Clear line of sight • Adequate space	• Site within constrained general aviation area • Impedes growth of Air Cargo
2	New ATCT between Airline Terminal and SDARNG	• Clear line of sight • Adequate space • Uses otherwise unusable area	• Narrow landside access
3	New ATCT on the East Side	• Central Location • Clear line of sight • Adequate space	• No existing public access • No existing utilities

Source: KLJ Analysis

Passenger Terminal Alternatives

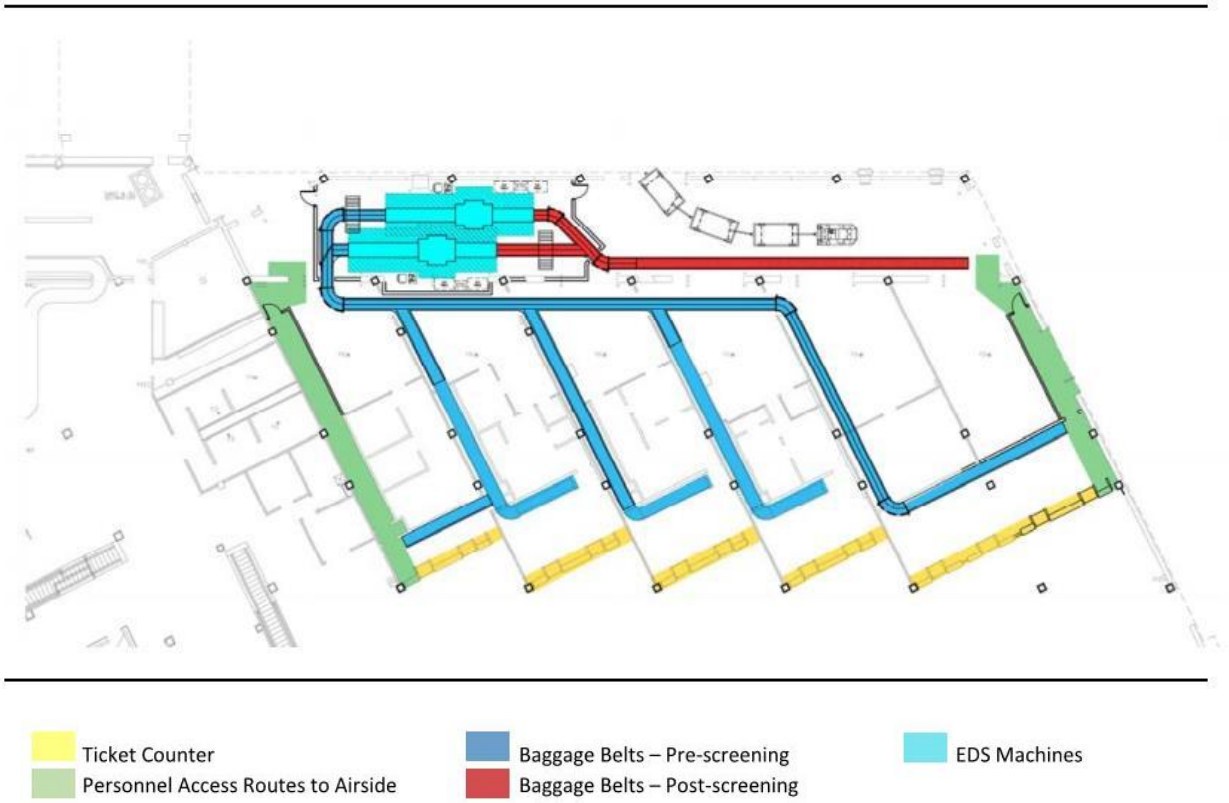
The Passenger Terminal was recently renovated which addressed space for passenger screening, concessions, baggage claim, rental cars and updating the facility. Chapter 4 – Requirements identified only a few items which should be addressed in the planning period. The most notable item is baggage screening and baggage makeup.

Baggage Screening is currently conducted behind each airline counter and is not sufficiently sized or configured to industry standards. The deficiency is noticed the most during heavy traffic loads. The Baggage Makeup area is directly related to Baggage Screening and therefore the two areas were examined together. The 2008 Airport Master Plan (AMP) generated four alternatives and a new alternative was added as a result of this Master Plan. This new alternative was not created in the 2008 AMP because of the plans at the time to continue to ground load some airlines from the concourse in the general area of Gates 1 and 2. This is no longer the case and therefore the new alternative, 2015-1 Alternative, baggage screening/baggage makeup alternative was created.

2008 AMP Alternative 1

Alternative 2008-1 proposes standard height baggage conveyors from behind each ticket counter to a pair of baggage screening machines behind the 2 airline positions closest to the center of the terminal. The baggage makeup area would be in the remaining portion of the existing baggage truck/cart corridor behind the remaining airline positions. All improvements would be inside the existing baggage truck/cart corridor with no building expansion. There would be two access points for airline personnel to enter the airside of the terminal.

Exhibit 5-5 –Baggage Screening/Makeup Alternative 2008-1

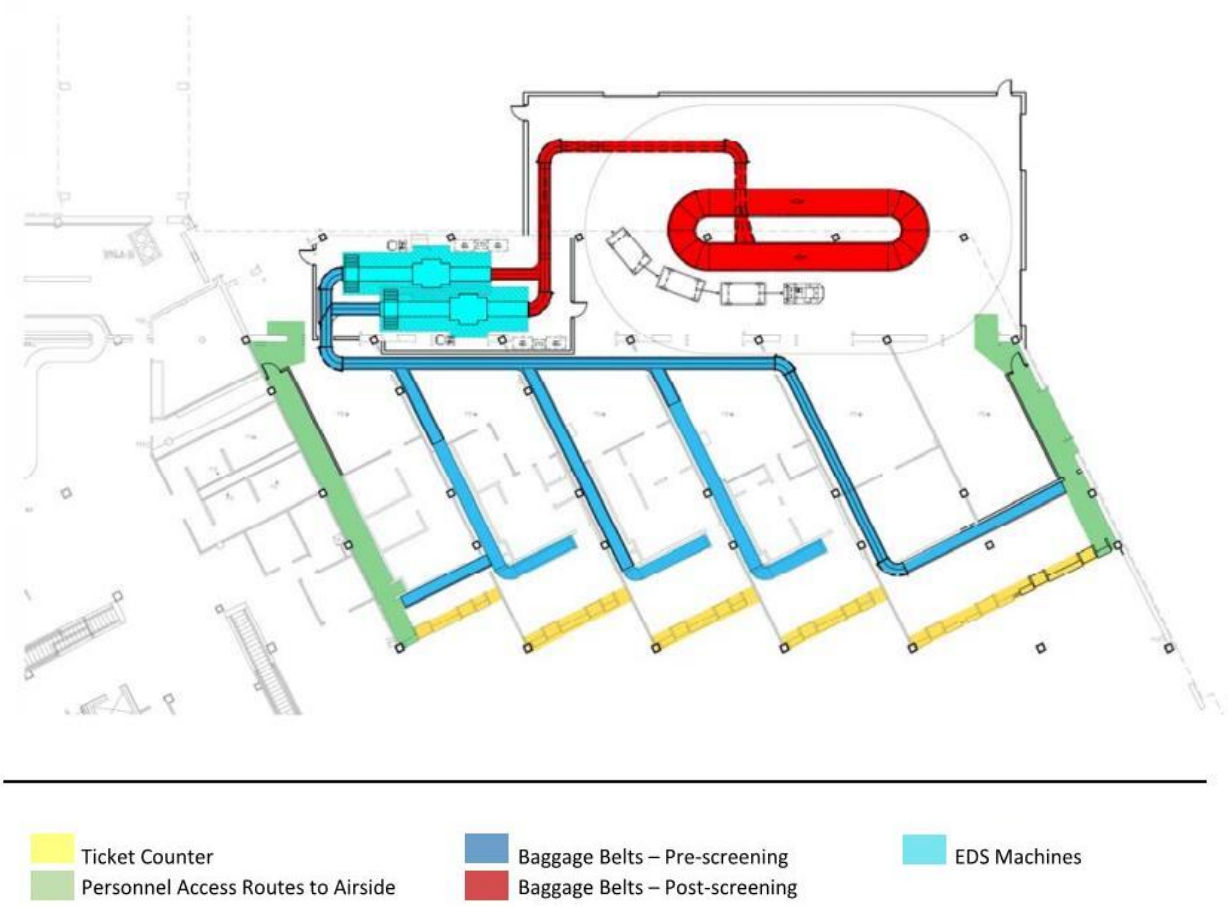


Source: Rapid City Regional Airport Master Plan 2008

2008 AMP Alternative 2

Alternative 2008-2 proposes standard height baggage conveyors from behind each ticket counter to a pair of baggage screening machines behind the 2 airline positions closest to the center of the terminal. The baggage makeup area would expand out and remain behind other airline positions. The baggage makeup area would have an oval conveyor for baggage truck/cart access. There would be two access points for airline personnel to enter the airside of the terminal.

Exhibit 5-6 – Baggage Screening/Makeup Alternative 2008-2

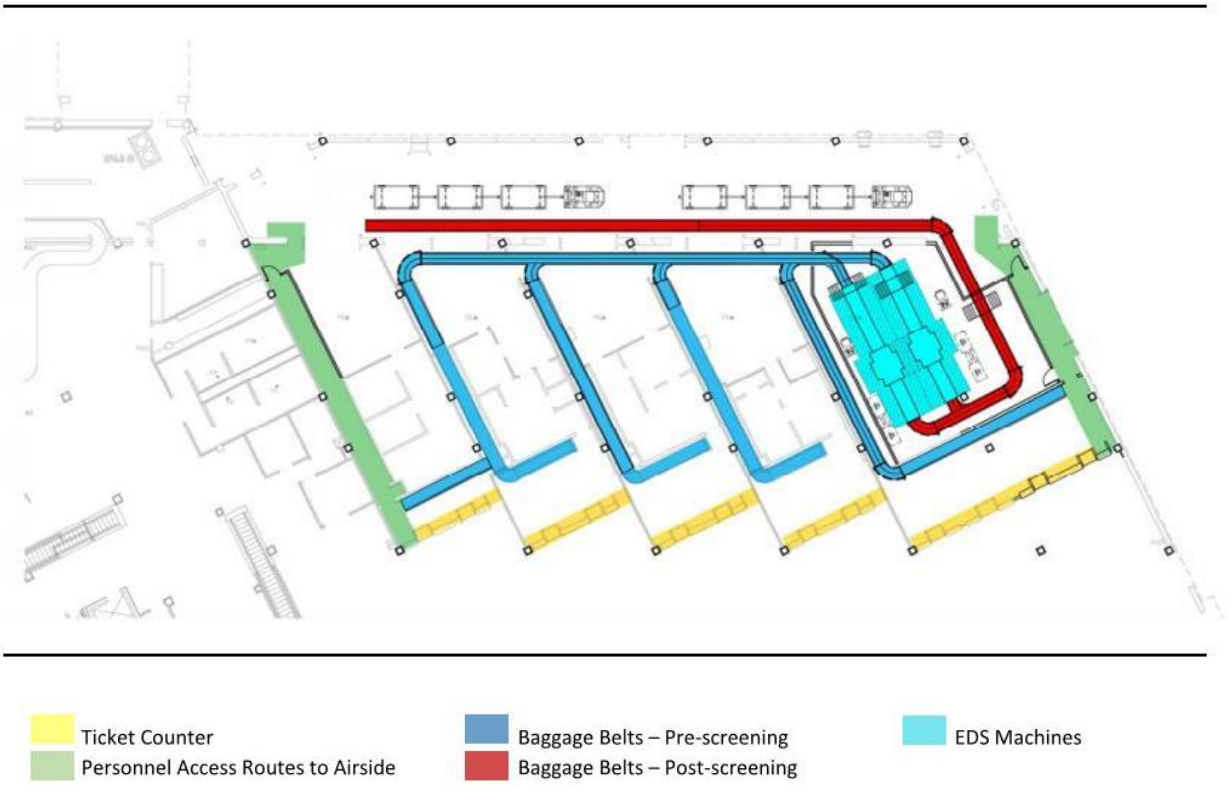


Source: Rapid City Regional Airport Master Plan 2008

2008 AMP Alternative 3

Alternative 2008-3 proposes standard height baggage conveyors from behind each ticket counter to a pair of baggage screening machines behind the 2 airline positions furthest from the center of the terminal. The baggage makeup area would use the existing baggage truck/cart corridor behind the remaining airline positions. All improvements would be inside the existing baggage truck/cart corridor and last 2 airline positions with no building expansion. There would be two access points for airline personnel to enter the airside of the terminal.

Exhibit 5-7 – Baggage Screening/Makeup Alternative 2008-3

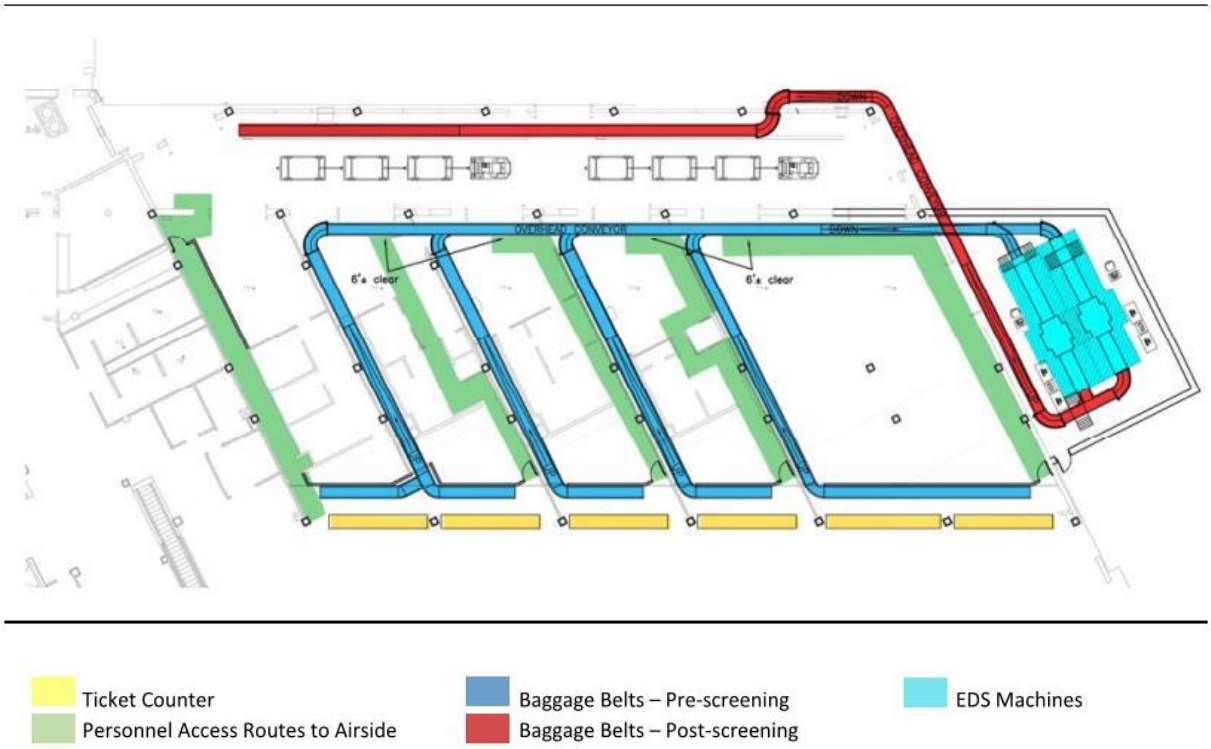


Source: Rapid City Regional Airport Master Plan 2008

2008 AMP Alternative 4

Alternative 2008-4 proposes standard height baggage conveyors from behind each ticket counter then elevated overhead to a pair of baggage screening machines outside of the existing terminal. The baggage makeup area would use the existing baggage truck/cart corridor behind the remaining airline positions. There would be an access point with 6 foot head room from each airline position to the airside of the terminal. This alternative was the preferred concept in the 2008 AMP.

Exhibit 5-8 – Baggage Screening/Makeup Alternative 2008-4



Source: Rapid City Regional Airport Master Plan 2008

2015 AMP Alternative 1

Alternative 2015-1 proposes standard height baggage conveyors from behind each ticket counter then elevated overhead through the current baggage truck/cart corridor then outside parallel to the concourse until it drops down to a pair of baggage screening machines underneath the terminal concourse. The baggage makeup area would be between the baggage screening area and the main terminal area. There would be an access point with 6 foot head room from each airline position to the airside of the terminal.

Exhibit 5-9 – Baggage Screening/Makeup Alternative 2015-1

Table 5-8 – Baggage Screening/Makeup Expansion Summary

Alt	Actions	Strengths	Weaknesses
No Build	No Build	• Minimal cost	• Does not meet current baggage screening demands • High staffing costs for TSA
2008-1	• Standard level conveyors • Screening behind airline positions closest to center of terminal • Makeup within the existing baggage truck/cart corridor	• No building expansion needed • Installs 2 baggage screening devices • Leaves room for terminal to be expanded with additional airline positions	• Tight space for baggage screening • Tight space for baggage makeup • Baggage makeup is linear requiring airlines to collect all bags on first run through • Only 2 access points for airlines to enter airside
2008-2	• Standard level conveyors • Screening behind airline positions closest to center of terminal • Makeup with an oval structure including the existing baggage truck/cart corridor	• Sufficient space for makeup with oval conveyor to collect bags • Installs 2 baggage screening devices • Leaves room for terminal to be expanded with additional airline positions	• Requires building expansion and affects one aircraft gate • Tight space for baggage screening • Only 2 access points for airlines to enter airside
2008-3	• Standard level conveyors • Screening behind airline positions furthest from center of terminal • Makeup within existing baggage truck/cart corridor	• No building expansion needed • Installs 2 baggage screening devices • Baggage makeup area is as existing	• Baggage makeup is linear requiring airlines to collect all bags on first run through • Only 2 access points for airlines to enter airside • Limits airline positions to 4 with no room for expansion
2008-4	• Standard level and overhead conveyors • Screening in new building area furthest from center of terminal • Makeup within existing baggage truck/cart corridor	• Installs 2 baggage screening devices • Baggage makeup area is as existing	• Baggage makeup is linear requiring airlines to collect all bags on first run through • Only 2 access points for airlines to enter airside • Limits airline positions to 6 with no room for expansion
2015-1	• Standard level and overhead conveyors • Screening under terminal concourse • Makeup under terminal concourse	• Installs 2 baggage screening devices • Baggage Screening area is sufficient • Sufficient space for makeup with oval conveyor to collect bags • Leaves room for terminal to be expanded with additional airline positions • Screening would be immediately below existing TSA passenger screening	• Requires building expansion • Largest amount of expanded space and largest amount of conveyor system

Source: KLJ Analysis

Recommended Baggage Screening/Baggage Makeup

The alternatives summarized in the above table are provided in a general sense as this master plan did not complete a terminal specific analysis. That being said, the need for an inline baggage screening system and consolidated make up area is expected to be a near term issue for the airport. It is recommended that the airport prioritize this need and consider Alternative 2015-1 as the best of these five presented alternatives. Additional evaluation is recommended before proceeding with a project for the baggage screening and makeup areas.

Terminal Apron

Considerations

The terminal apron needs to be sized to accommodate the maneuvering of the design aircraft for each concourse gate. Facility requirements identified the need for at least two de-icing pads and to continue to use the terminal for Remain-Over-Night (RON) parking stands.

Terminal Apron Alternative 0 (no change)

If no changes are made the current deicing facility which is adjacent and parallel to taxilane T1 would continue to be used. The deicing pad is sufficient for one Group III aircraft. With the removal of the old terminal building the space is opened up enough to use this area for other purposes.

Terminal Apron Alternative 1

Alternative 1 established three Group III aircraft deicing positions which would all be parallel to Taxilane T1 and use a portion of Taxilane T1. This option requires 9,300 square yards of new paving.

On the Terminal apron 2,600 and 1,500 square yards of concrete would be added to square off these aprons on the north and south side of the terminal. This would allow more room for aircraft push back. The entry road to the car rental area would be realigned 300’ to the northwest and the amount of parking for car rentals would stay relatively equal in the existing area. See **Exhibit 5-1 Alternative 1.**

Terminal Apron Alternative 2

Alternative 2 established three Group III aircraft deicing positions which were perpendicular to Taxiway A and also use a portion of Taxilane T1. This option requires 8,300 square yards of new paving.

On the terminal apron 2,600 and 1,500 square yards of concrete would be added to square off these aprons on the north and south side of the terminal. This would allow more room for aircraft push back. The entry road to the car rental area would be realigned 300’ to the northwest and the amount of parking for car rentals would stay relatively equal in the existing area. See **Exhibit 5-2 Alternative 2.**

Terminal Apron Alternative 3

Alternative 3 established three Group III aircraft deicing positions which were perpendicular to Taxiway A but did not used Taxilane T1 or T2. This option requires 25,200 square yards of new paving.

No other changes would be made to the terminal apron. See **Exhibit 5-3 Alternative 3.**

Table 5-9 – De-Icing Apron Alternative Evaluation

Alts	Actions*	Strengths	Weaknesses
No Change	No Action	• Minimal investment	• Only one position • Could impede air cargo depending on preferred cargo area alternative • Future capacity needs not met
1	• Construct 9,300 SY adjacent to T1 • Pavement markings for 3 - Group III aircraft positions	• One position available without impacting T1	• Requires use of T1 when all 3 positions are active
2	• Construct 8,300 SY adjacent to T1 • Pavement markings for 3 - Group III aircraft positions	• Lease amount of paving	• Requires use of T1 when all 3 positions are active • Requires T1 to be realigned to make one unimpeded position
3	• Construct 25,200 SY between T1 and T2 • Pavement markings for 3 - Group III aircraft positions	• Provides greatest amount of space without impacting Taxilanes T1 or T2	• Largest amount of paving required

Source: KLJ Analysis.

Preferred Alternative

The preferred alternative is Alternative 3. This alternative best utilizes available space and meets facility requirements. The concept provides a de-ice facility without impacting either T1 or T2. Any containment needs for the deicing area will need to be evaluated at the time of design. The paving could be accomplished in phasing adding 1 to 2 positions initially.

The terminal apron would be expanded by squaring off the corners of the apron as identified in Alternatives 1 and 2. See Exhibit 5-4 Preferred Alternative.

General Aviation & Other Development Alternatives

General Aviation

Rapid City is forecast to see growth in general aviation (GA) operations and based aircraft. The airport is the only public use facility serving Rapid City and therefore should be sufficient to meet the general aviation needs of the area as well as the commercial needs already identified. General Aviation has seen growth in the Rapid City area but development of facilities has been only on an incremental basis.

The following section summarizes key general aviation facility requirement findings:

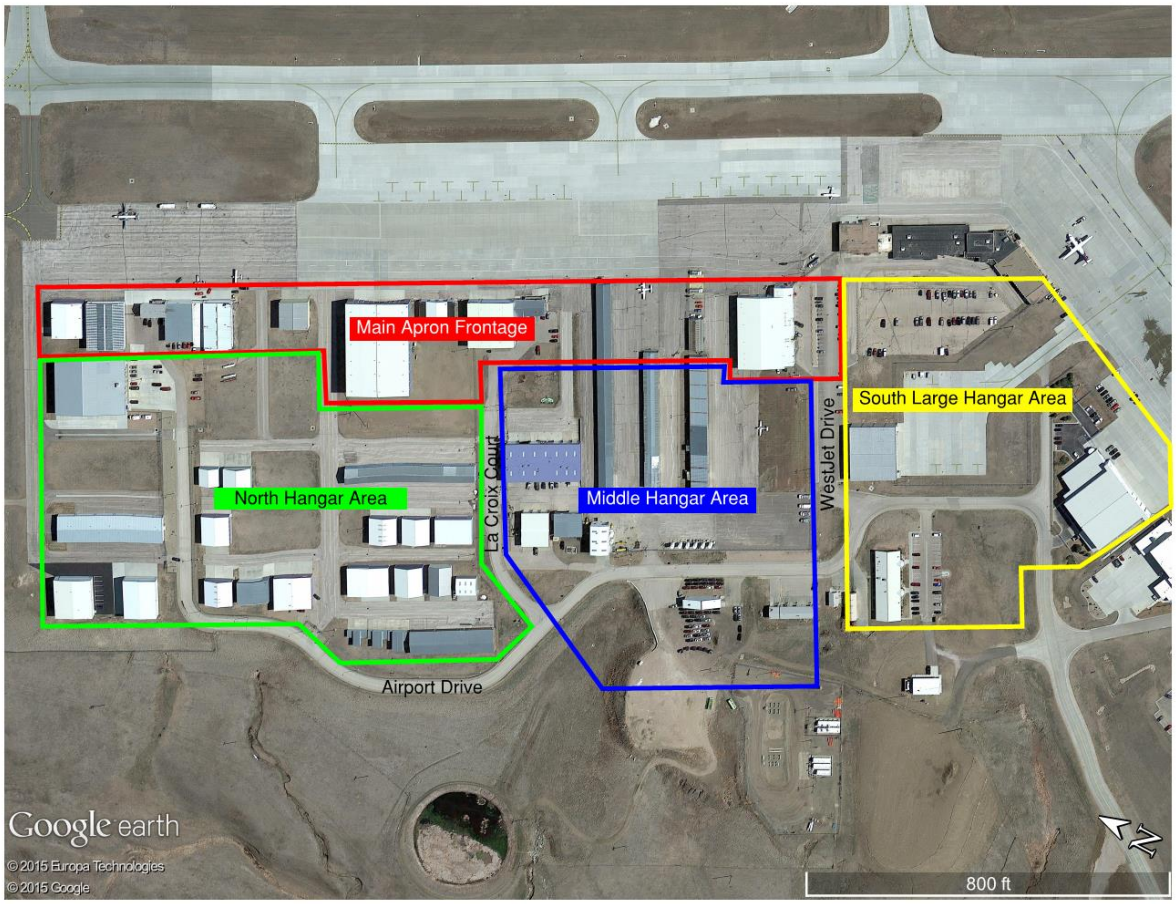
- **Provide an additional 40 percent of aircraft storage space to forecast demand.**
- **Replace capacity scheduled to be lost when 27 T-hangar units (38,060 square feet) are demolished.**
- **Provide flexible development plans to accommodate growth for different sizes of aircraft and types of users.**

GA activity at Rapid City is located on the west side of Runway 14-32 between the Airline Terminal and the approach to Runway 5. This area is constrained and will require fill and proper reuse of land to accommodate development needs.

GA development concepts were primarily on the west side but alternatives using the east side were also examined. The Airport required an immediate layout concept for small hangars during the master plan process and this development concept for the 'north hangar area' was used in all 3 alternatives. There are two primary groups of general aviation aircraft that the hangar development is intended to address. These are Group I Aircraft (<49' wingspan, with a 79' Taxilane Object Free Area TOFA) and Group II Aircraft (≥49' but <79' wingspan, with a 115' TOFA). To simplify how the alternatives are examined the general aviation area is divided into four areas which are shown on the following **Exhibit 5-10 General Aviation Areas**:

Main Apron Frontage (RED) – all hangars with frontage to the main apron excluding any hangars in the south large hangar area.
North Hangar Area (GREEN) - all hangars north of La Croix Court excluding any hangars fronting the main apron.
Middle Hangar Area (BLUE) – all hangars between WestJet Drive and La Croix Court excluding any hangars fronting on the main apron.
South Large Hangar Area (YELLOW) – all hangars south of WestJet Drive and north of the Airline Terminal including hangars fronting the main apron.

Exhibit 5-10 – General Aviation Areas



Source: Google Earth and KLJ Analysis

North Hangar Area

As noted before, this area of hangar development is identical for each of the three alternatives. This arrangement was determined by the airport to facilitate short term development. This north hangar area is the area north of La Croix Court, and is shown in the following **Exhibit 5-11 North Hangar Area**.

The layout for the north hangar area will add the most amount of hangar space in this area for primarily Group I aircraft which currently are in this area. The following are the hangars:

10 Unit T-Hangar in PAL1
4 Unit Group I Hangar in PAL1
3 Unit Group I Hangar in PAL1
40'x50' Hangars (2 in PAL1)
80'x120' Hangar in PAL1

Exhibit 5-11 North Hangar Area

Source: Google Earth and KLJ Analysis

General Aviation Alternative 1

The general aviation layout for Alternative 1 is described below and found in **Exhibit 5-12 Alternative 1 GA.**

Main Apron Frontage

Add 7,000[3] square yards of apron to the north end of the apron to maintain consistent 320' depth of the apron from hangars. Hangars include:

100'x100' Hangar in PAL1
100'x100' Hangar in PAL3 after removal of existing 60'x60' hangar
120'x100' Hangar in PAL3 after removal of 2 smaller hangars (existing hangars have a total of 11,100 square feet of space)

Middle Hangar Area

A group II taxilane will be included to access the main apron area. Hangars include:

10 Unit T-Hangars (2 in PAL1, 1 in PAL2, 1 in PAL3)
4 Unit Group I Hangar in PAL3
6 Unit Group II T-Hangars (1 in PAL3, 1 in PAL4)
60'x70' Hangars (2 in PAL4)

South Large Hangar Area

A group II taxilane will remain to access the main apron. Hangar development would only be on the north side to allow storage of aircraft in front of hangars without impeding access to other hangars for Group II aircraft. The apron would be expanded by 6,300 square yards to the west adjacent to the existing TSA office building. Hangars include:

80'x80' Hangars (1 in PAL1, 2 in PAL2)
100'x80' Hangar in PAL3

Table 5-10 Hangars for Alternative 1

Hangars for Alternative 1					
Aircraft Group	**Description**	**Units**	**Square Feet**	**Need by PAL4**	**Excess/ (Deficiency) of hangar space**
Group I	T-Hangars	80	111,830	113,970	(2,140)
Group I & II	Small Conventional	33	120,263	86,280	33,983
Group II	Large Conventional	14	175,175	164,790	10,385
		Total	407,268	365,040	42,228

[3] The Runway Visibility Zone would restrict some of this apron unless the threshold to Runway 5 were relocated to the east by at least 105 feet. Any relocation of the Runway 5 threshold must consider the close proximity of Taxiway A and Runway 14-32 as well as issue of removing any direct taxiway connections from the apron to Runway 5 and 14-32.

Exhibit 5-12 Alternative 1 - GA

General Aviation Alternative 2

The general aviation layout for Alternative 2 is described below and found in **Exhibit 5-13 Alternative 2 - GA.**

Main Apron Frontage

Add 7,000[4] square yards of apron to the north end of apron to maintain consistent 320' depth of the apron from the hangars. Hangars include:

100'x100' Hangar in PAL1
100'x100' Hangar in PAL2
100'x100' Hangar in PAL3 after removal of existing 60'x60' hangar
120'x100' Hangar in PAL3 after removal of 2 smaller hangars (existing hangars have a total of 11,100 square feet of space)

Middle Hangar Area

Group II taxilane for access to main apron. Hangars include:

10 Unit T-Hangars (2 in PAL1, 1 in PAL2, 1 in PAL3)
4 Unit T-Hangars (3 in PAL4)
8 Unit Group II T-Hangar in PAL3
4 Unit Group II Hangar in PAL4
3 Unit Group II Hangars (2 in PAL4)

South Large Hangar Area

A group II taxilane will remain to access the main apron. Hangar development would only be on the north side to allow storage of aircraft in front of hangars without impeding access to other hangars for Group II aircraft. The apron would be expanded by 6,300 square yards to the west adjacent to the existing TSA office building. Hangars include:

80'x80' Hangars (1 in PAL1, 2 in PAL2)
100'x80' Hangar in PAL3

Table 5-11 Hangars for Alternative 2

Hangars for Alternative 2					
Aircraft Group	**Description**	**Units**	**Square Feet**	**Need by PAL4**	**Excess/ (Deficiency) of hangar space**
Group I	T-Hangars	89	117,322	113,970	3,352
Group I & II	Small Conventional	37	127,143	86,280	40,863
Group II	Large Conventional	15	185,175	164,790	20,385
		Totals	429,640	365,040	64,600

[4] The Runway Visibility Zone would restrict some of this apron unless the threshold to Runway 5 were relocated to the east by at least 105 feet. Any relocation of the Runway 5 threshold must consider the close proximity of Taxiway A and Runway 14-32 as well as issue of removing any direct taxiway connections from the apron to Runway 5 and 14-32.

Exhibit 5-13 Alternative 2 - GA

General Aviation Alternative 3

The general aviation layout for Alternative 3 is described below and found in **Exhibit 5-14 Alternative 3 – GA West** and **Exhibit 5-15 Alternative 3 GA East.**

Main Apron Area

Add 7,000[5] square yards of apron to the north end of apron to maintain consistent 320' depth of the apron from hangars. Hangars include:

100'x100' Hangar in PAL1
100'x100' Hangar in PAL2
100'x100' Hangar in PAL3 after removal of existing 60'x60' hangar
120'x100' Hangar in PAL3 after removal of 2 smaller hangars (existing hangars have a total of 11,100 square feet of space)

Middle Hangar Area

Group I taxilane for access to main apron. Hangars include:

10 Unit T-Hangars (2 in PAL1)
4 Unit T-Hangars (2 in PAL2)

South Large Hangar Area

The apron will be suited to group II aircraft but no designated taxilane would exist as hangars are constructed on the north and south side of the apron. This will not allow aircraft to be parked in front of the hangars without impeding access to other hangars for Group II aircraft. Hangars include:

80'x80' Hangars (2 in PAL1, 2 in PAL2, 2 in PAL3)

East General Aviation Area

45,800 square yards of main apron area on the east side of the airport. Hangars include:

100'x100' Hangars (2 in PAL2, 1 in PAL3, 1 in PAL4)
80'x80' Hangars (2 in PAL2, 1 in PAL3, 1 in PAL4)
10 Unit T-Hangars (2 in PAL2, 1 in PAL3, 3 in PAL4)
40'x50' Hangars (8 in PAL3, 8 in PAL4)

Table 5-12 Hangars for Alternative 3

Hangars for Alternative 3					
Aircraft Group	**Description**	**Units**	**Square Feet**	**Need by PAL4**	**Excess/ (Deficiency) of hangar space**
Group I	T-Hangars	128	162,100	113,970	48,130
Group I & II	Small Conventional	35	104,983	86,280	18,703
Group II	Large Conventional	25	219,975	164,790	55,185
		Totals	529,058	365,040	164,018

[5] The Runway Visibility Zone would restrict some of this apron unless the threshold to Runway 5 were relocated to the east by at least 105 feet. Any relocation of the Runway 5 threshold must consider the close proximity of Taxiway A and Runway 14-32 as well as issue of removing any direct taxiway connections from the apron to Runway 5 and 14-32.

Exhibit 5-14 Alternative 3 - GA West

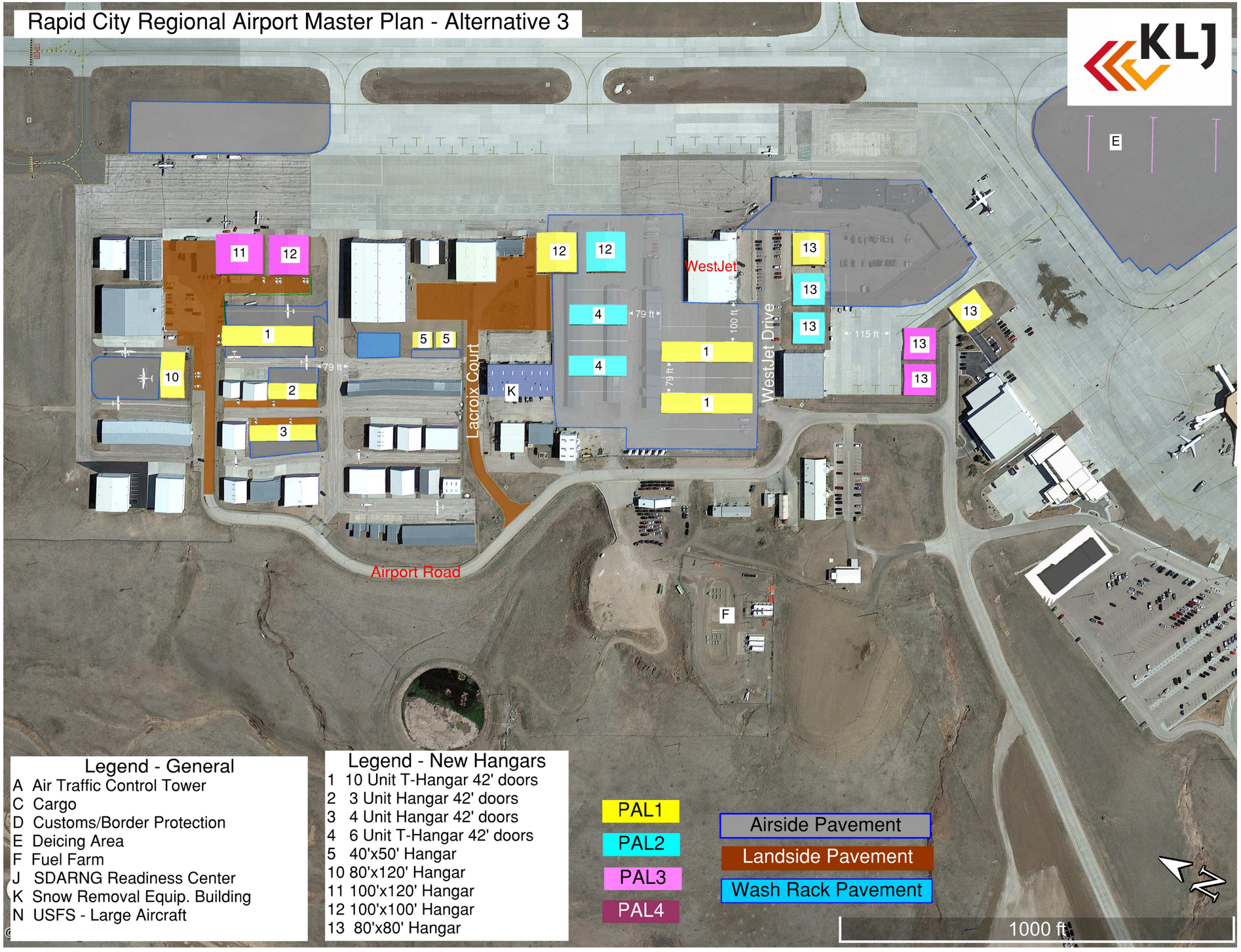
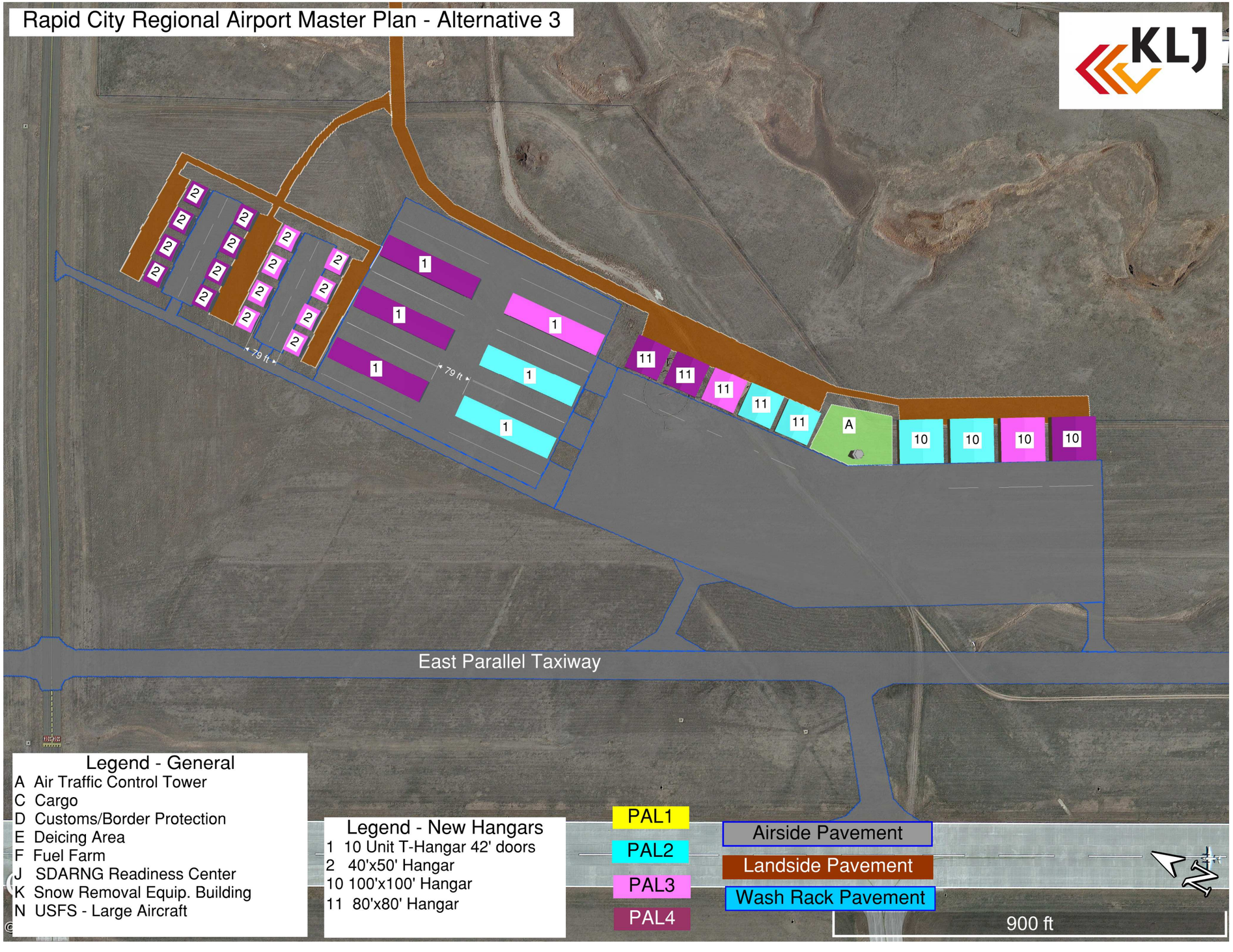


Exhibit 5-15 Alternative 3 - GA East



Preferred Alternative

The preferred alternative for General Aviation is Alternative 2 and a portion of hangar development on the east side from Alternative 3. This makes the best use of space, has the ability to accommodate general aviation and air cargo in an integrated manner and provides the opportunity for growth to the east in the long term. See Exhibit 5-16 Preferred Alternative GA – West and Exhibit 5-17 Preferred Alternative GA - East.

Main Apron Frontage

Add 7,000[6] square yards of apron to the north end of apron to maintain consistent 320' depth of the apron from the hangars. Hangars include:

- 100'x100' Hangar in PAL1
- 100'x100' Hangar in PAL2
- 100'x100' Hangar in PAL3 after removal of existing 60'x60' hangar
- 120'x100' Hangar in PAL3 after removal of 2 smaller hangars (existing hangars have a total of 11,100 square feet of space)

Middle Hangar Area

Group II taxilane for access to main apron. Hangars include:

- 10 Unit T-Hangars (2 in PAL1, 1 in PAL2, 1 in PAL3)
- 4 Unit T-Hangars (3 in PAL4)
- 8 Unit Group II T-Hangar in PAL3
- 4 Unit Group II Hangar in PAL4
- 3 Unit Group II Hangars (2 in PAL4)

South Large Hangar Area

A group II taxilane will remain to access the main apron. Hangar development would only be on the north side to allow storage of aircraft in front of hangars without impeding access to other hangars for Group II aircraft. The apron would be expanded by 6,300 square yards to the west adjacent to the existing TSA office building. Hangars include:

- 80'x80' Hangars (1 in PAL1, 2 in PAL2)
- 100'x80' Hangar in PAL3

East General Aviation Area

45,800 square yards of main apron area on the east side of the airport. Hangars include:

- 100'x100' Hangars (2 in PAL4)
- 80'x80' Hangars (3 in PAL4)
- 10 Unit T-Hangars (2 in PAL2, 1 in PAL3, 3 in PAL4)
- 40'x50' Hangars (8 in PAL3, 8 in PAL4)

[6] The Runway Visibility Zone would restrict some of this apron unless the threshold to Runway 5 were relocated to the east by at least 105 feet. Any relocation of the Runway 5 threshold must consider the close proximity of Taxiway A and Runway 14-32 as well as issue of removing any direct taxiway connections from the apron to Runway 5 and 14-32.

Table 5-13 Hangars for Preferred Alternative

Hangars for Preferred Alternative							
Aircraft Group	Description	Units		Square Feet		Need by PAL4	Excess/ (Deficiency) of hangar space
		W	E	W	E		
Grp I	T-Hangars	89	30	117,322	35,190	113,970	38,542
Grp I & II	Small Conventional	37	8	127,143	16,000	86,280	56,863
Grp II	Large Conventional	15	5	185,175	39,200	164,790	59,585
			Totals	429,640	90,390	365,040	154,990

Exhibit 5-16 Preferred Alternative - GA West

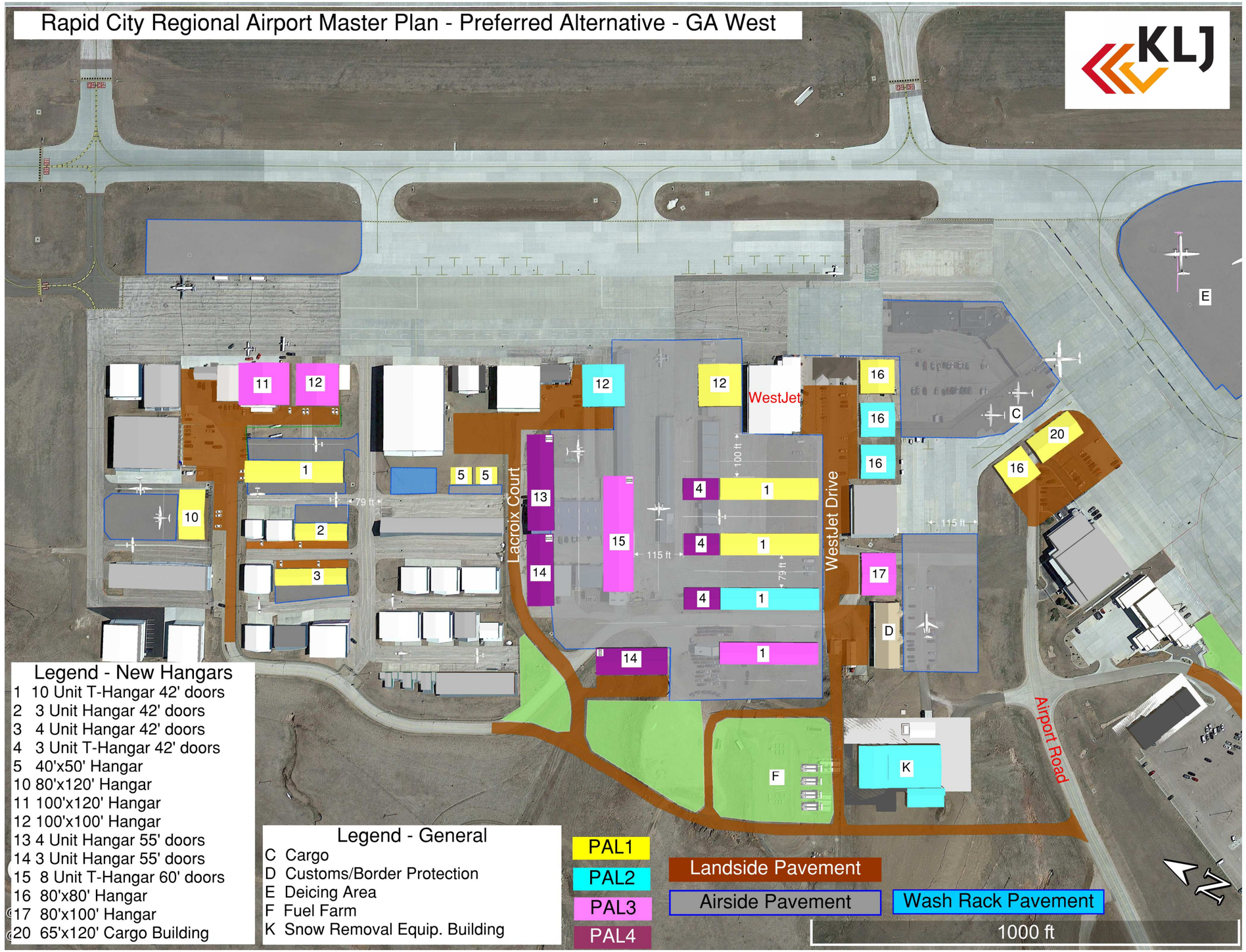
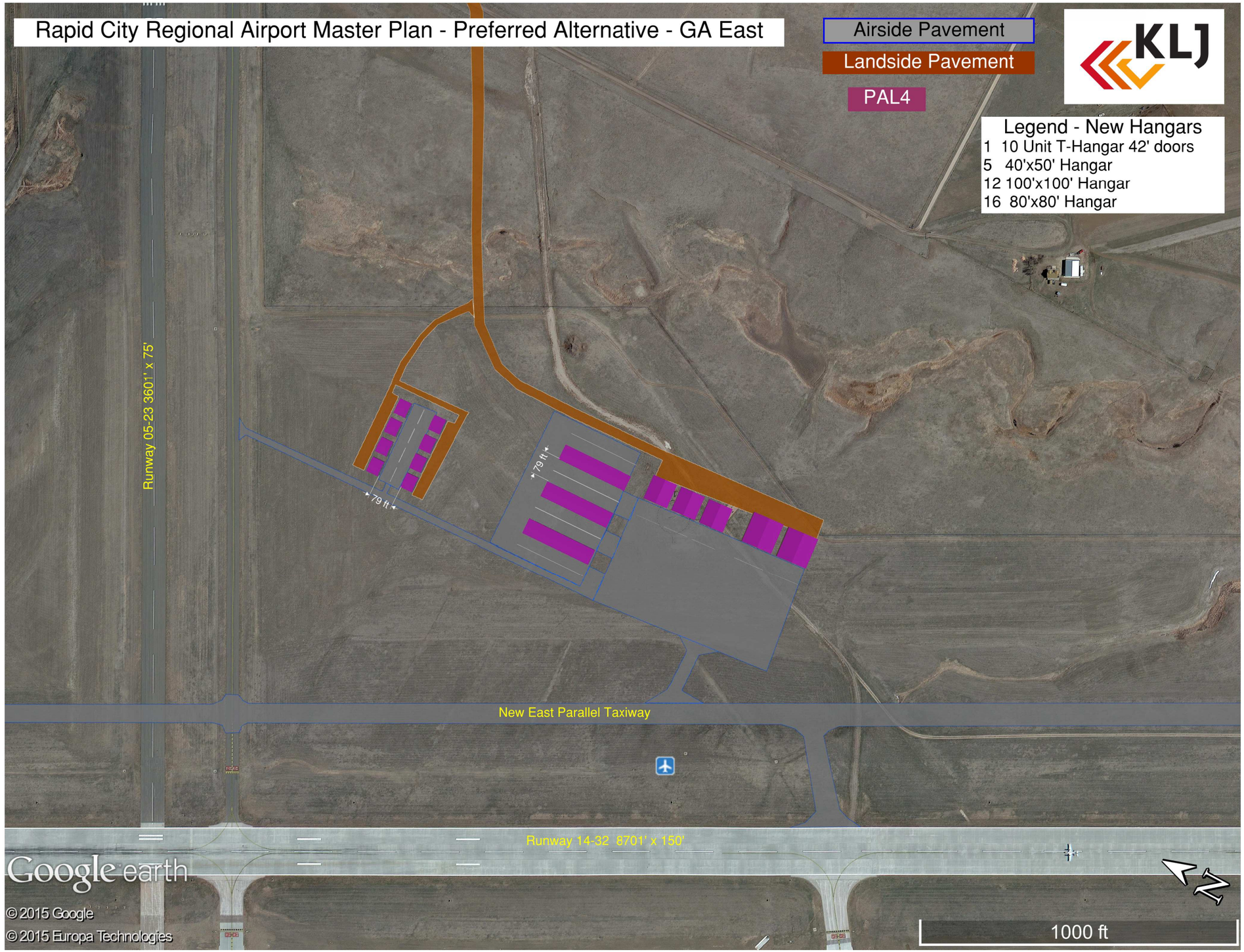


Exhibit 5-17 Preferred Alternative - GA East



Air Cargo

The air cargo area at Rapid City is considered a vital component of the airport. As a regional destination point for two cargo airlines and the USPS, accommodating future growth needs at the airport is important. The following section summarizes air cargo facility requirements:

- **Provide an initial 5,700 SY of air cargo apron with an estimated need up to 9,000 SY through the planning period.**
- **Provide an area for sorting and hangar facilities in the vicinity of the apron area.**

The critical design aircraft is an ATR 42, an Airplane Design Group III airplane with Taxiway Design Group 2 standards. Through PAL 4, approximately 57 percent more apron space will be required to meet forecast demand.

Several air cargo development concepts were evaluated to best accommodate the facility requirements considering the existing infrastructure and constrained environment. The existing site is adjacent to the old terminal and is subject to repurposing as a part of this Master Plan process.

Air Cargo Alternative 1

Alternative 1 is near the existing cargo area and includes a 65' x 120' cargo building. The apron would be 7,800 square yards which would require using the existing deicing apron. See **Exhibit 5-1 Alternative 1.**

Air Cargo Alternative 2

Alternative 2 is near the existing cargo area and includes a 65' x 120' cargo building and a 80' x 80' hangar. The apron would be up to 8,100 square yards which would use the existing deicing apron. See **Exhibit 5-2 Alternative 2.**

Air Cargo Alternative 3

Alternative 3 is to the south near the USFS tanker facility and includes a 65' x 120' cargo building. The apron would be up to 4,900 square yards including a Customs and Border Protection facility which would use the same apron. See **Exhibit 5-3 Alternative 3.**

Table 5-14 – Air Cargo Alternative Evaluation

Alts	Actions	Strengths	Weaknesses
No Change	No Action	• Minimal investment	• This is not an option as the area has been
1	Southeasterly facing facility near existing area	• Uses portions of existing apron • Least costly alternative	• Loss of Deicing area
2	Northeasterly facing facility near existing area	• Uses portions of existing apron • Includes a Hangar	• Loss of Deicing area for expansion
3	New cargo area near USFS air tanker base	• Adjacent to CBP facility • Sufficient room for expansion	• Requires new roads, apron and taxilanes to function • Highest cost alternative

Preferred Alternative

The preferred alternative is Alternative 2 because of its ability to meet needs and not impede into airline terminal area. See **Exhibit 5-4 Preferred Alternative.**

Military Facilities

Recommended development of SDARNG facilities are driven by their own facility master plan studies. These facilities have a lease with the airport through at least 2056; beyond the planning period for this study.

The boundary for the SDARNG facilities are not proposed to change. The SDARNG facility master plan proposes to add a Readiness facility within the existing leased area and modify the entry point to the SDARNG facility.

It is recommended that the airport continue to coordinate with the SDARNG to assure that the Army National Guard and all other users can operate effectively with each other. Some uses by the SDARNG are non-aeronautical in nature and for these areas a lease of fair market value is required.

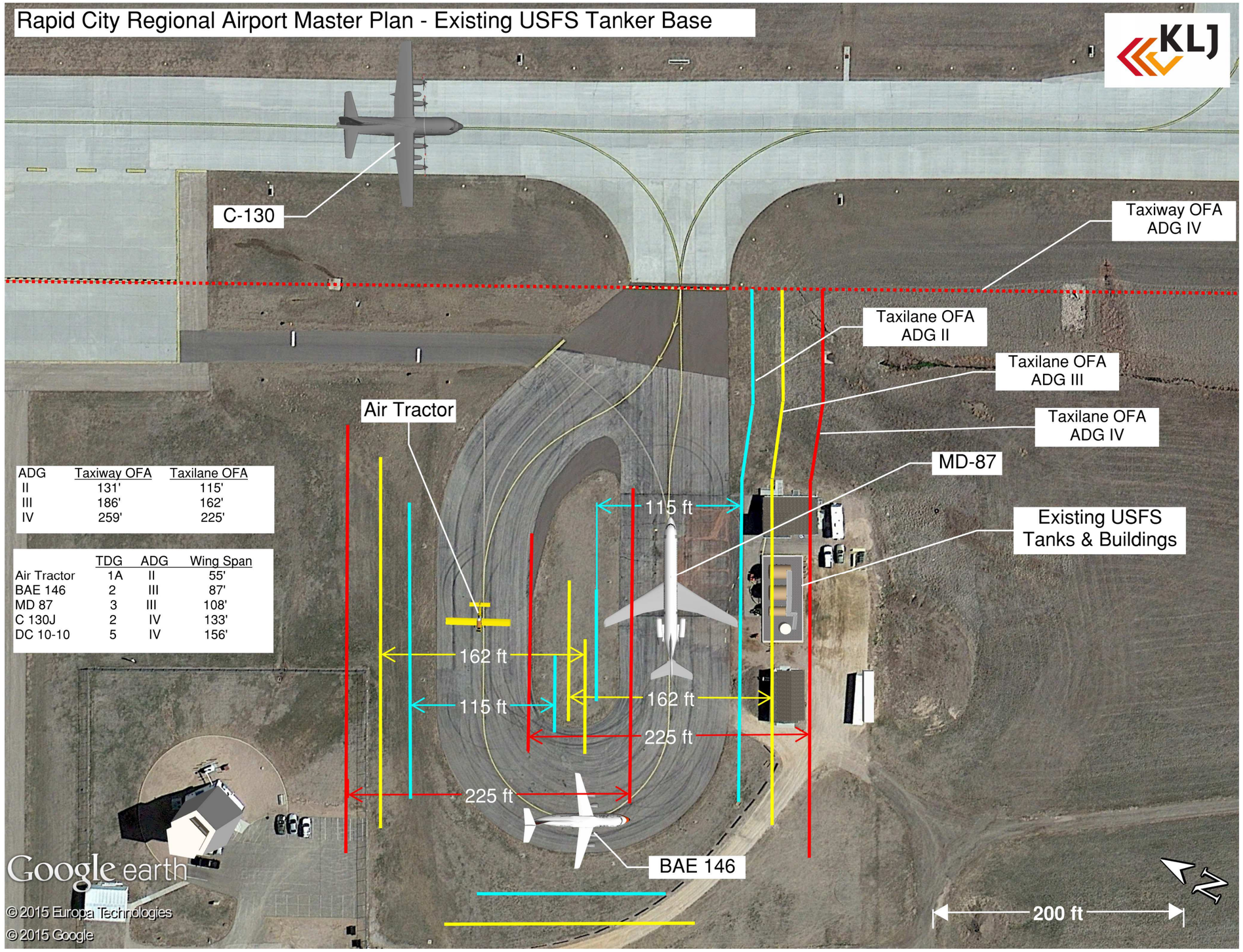
USFS Air Tanker Base

The needs for the U.S. Forest Service are determined by the operational needs for the air tankers. The tankers contracted by the USFS are changing and generally becoming larger. To accommodate these changes the alternatives included supporting aircraft up to a DC-10 aircraft but were generally developed to support MD-87 and C-130 aircraft. Since the USFS operation is a federally funded activity, the Federal Aviation Administration restricts the use of Airport Improvement Program (AIP) funding to cover these USFS improvements. It will therefore be necessary to use sources other than AIP to complete any improvements.

No Change

The no change scenario is one that continues to be considered for the USFS Air Tanker Base. To help depict the issues with a no change scenario **Exhibit 5-18 USFS Existing Conditions** provides information relative to the aircraft expected to use the Air Tanker Base.

Exhibit 5-18 USFS Existing



Alternatives 1 & 2

Alternatives 1 & 2 are identical and were selected by the USFS as their preferred option. This alternative would continue to use existing tanks in place. One loop would be modified using the existing pavement for single engine aircraft and one new loop would be constructed for large aircraft up to DC-10 with 3 possible loading pads. See **Exhibit 5-2 Alternative 2.**

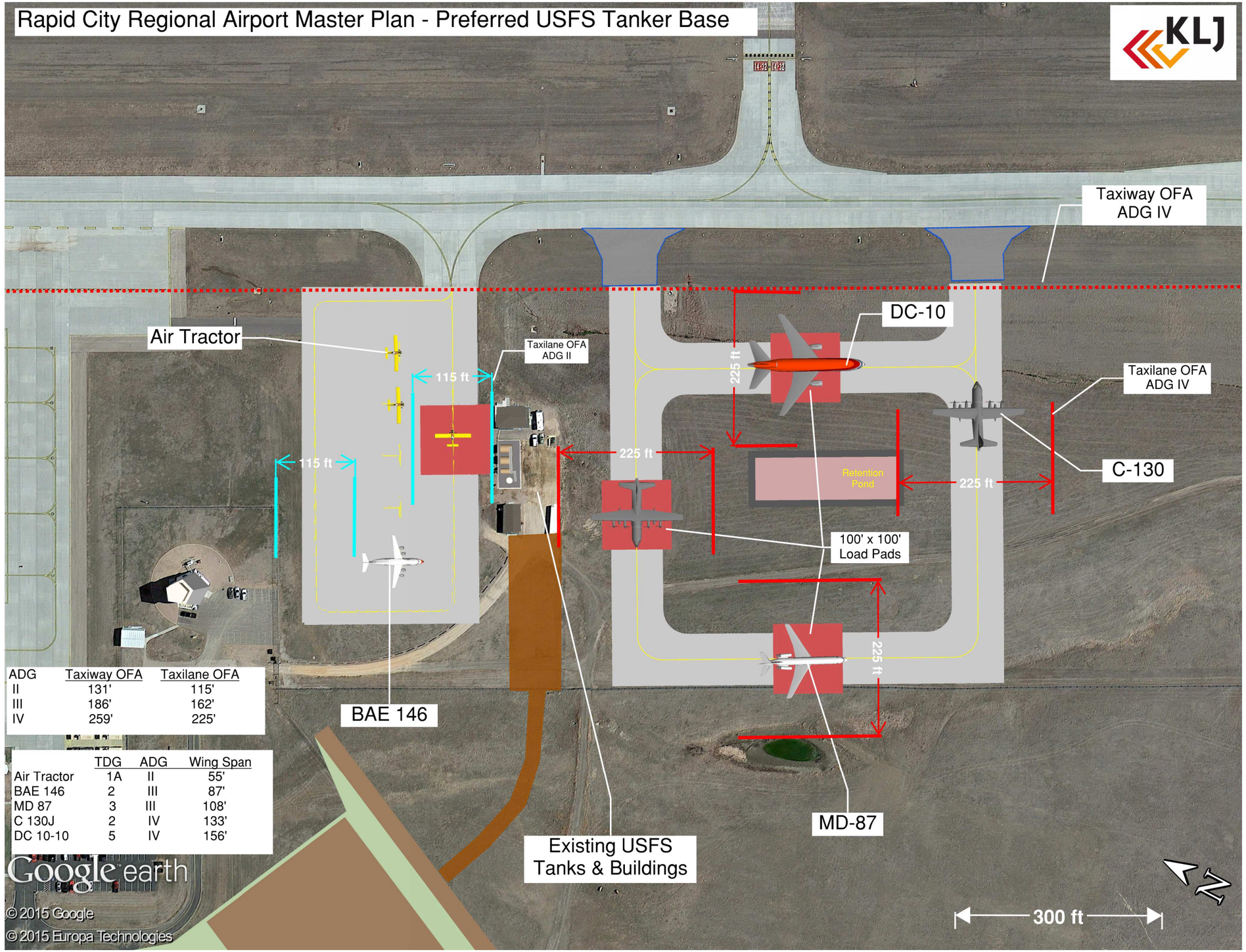
Alternative 3

Alternative 3 was another option prepared for the USFS to consider. It included two loops for large aircraft up to DC-10 using a new tank and building area. See **Exhibit 5-3 Alternative 3.**

Preferred Alternative

The preferred alternative selected by the Airport Board included the improvements identified in Alternatives 1 & 2. See **Exhibit 5-19 Preferred Alternative – USFS Air Tanker Base.**

Exhibit 5-19 USFS Preferred Alternative



Landside Development Alternatives

Parking Requirements

In general there is sufficient space for public parking, but it was found there was a lack of space for rental car storage. The alternatives looked at different options to add parking from a long term stand point and to address the lack of rental car storage.

Alternative 1

Alternative 1 has two lower terraced parking areas added to the north and west of the current car rental area adding approximately 160 new spaces. A single story parking garage (approx. 340 new spaces) would be added in front of the airline terminal. See **Exhibit 5-1 Alternative 1.**

Alternative 2

Alternative 2 has a lower terraced parking area added to the west of the current car rental area adding approximately 110 new spaces. A single story parking garage (approx. 260 new spaces) would be added over the existing car rental area. See **Exhibit 5-2 Alternative 2.**

Alternative 3

Alternative 3 adds no public parking or rental car parking. See **Exhibit 5-3 Alternative 3.**

Preferred Alternative

The preferred alternative for parking is the terraced parking from Alternative 2 for rental car storage and a new surface lot south and east of the existing surface lots but remaining inside the Terminal Road loop. See **Exhibit 5-20 Preferred Alternative.**

Non-Aeronautical Development Area

There are portions of the airport that do not have access to the airfield which can otherwise be used for other development. This is often used for non-aeronautical development and therefore areas were identified which could be used in this manner. All non-aeronautical development is required to be shown on the Airport Layout Plan and approved by FAA.

Alternative 1

A business park area would be constructed with access off of Terminal Road. The access point would be where the one-way Terminal Road has a T-intersection back with the beginning portion of Terminal Road. See **Exhibit 5-1 Alternative 1.**

Alternative 2

A business park area would be constructed with access off of RTR Road. The area would be bound by Terminal Road on the south, east and west sides. See **Exhibit 5-2 Alternative 2.**

Alternative 3

No business park area was added. See **Exhibit 5-3 Alternative 3.**

Preferred Alternative

The preferred alternative for Non-Aeronautical Development was Alternative 1. This provided the largest amount of development area without impeding terminal area parking. See Exhibit 5-20 Preferred Alternative.

Support Facility Alternatives

Fueling Facilities

The existing fuel farm is sufficient through the planning period. Additional tanks can be added as the FBO requires. The realignment of WestJet Drive may require some changes to the fuel farm area. Any changes will be identified as the design process for WestJet Drive is conducted.

Aircraft Rescue and Fire Fighting (ARFF)

The ARFF station is owned by the airport and staffed by firefighters from the City of Rapid City. There are no changes needed for this facility.

Airport Maintenance & Snow Removal

The airport maintenance/snow removal facility is situated in an area that is ideally suited for hangar development. It is recommended by PAL 3 that a new facility be constructed to open up this area for hangar development. Alternatives 1 and 2 depict the new location for the airport maintenance/snow removal equipment facility.

The preferred alternative for airport maintenance/snow removal facility was determined to be that shown in Alternatives 1 and 2. See **Exhibit 5-20 Preferred Alternative.**

Customs and Border Protection (CBP)

A CBP General Aviation Facility was identified as a need for Rapid City. Each alternative included a CBP facility. Alternatives 1 and 2 used a portion of the current TSA office building for the CBP facility. Alternative 3 located a CBP facility with Air Cargo near the current USFS Air Tanker Base to the south.

The preferred alternative for CBP was determined to be that shown in Alternatives 1 and 2. See **Exhibit 5-20 Preferred Alternative.**

Security Fencing & Wildlife Control

There are no recommendations for changes in security fencing or wildlife control other than to maintain the existing facilities.

Internal Perimeter Road

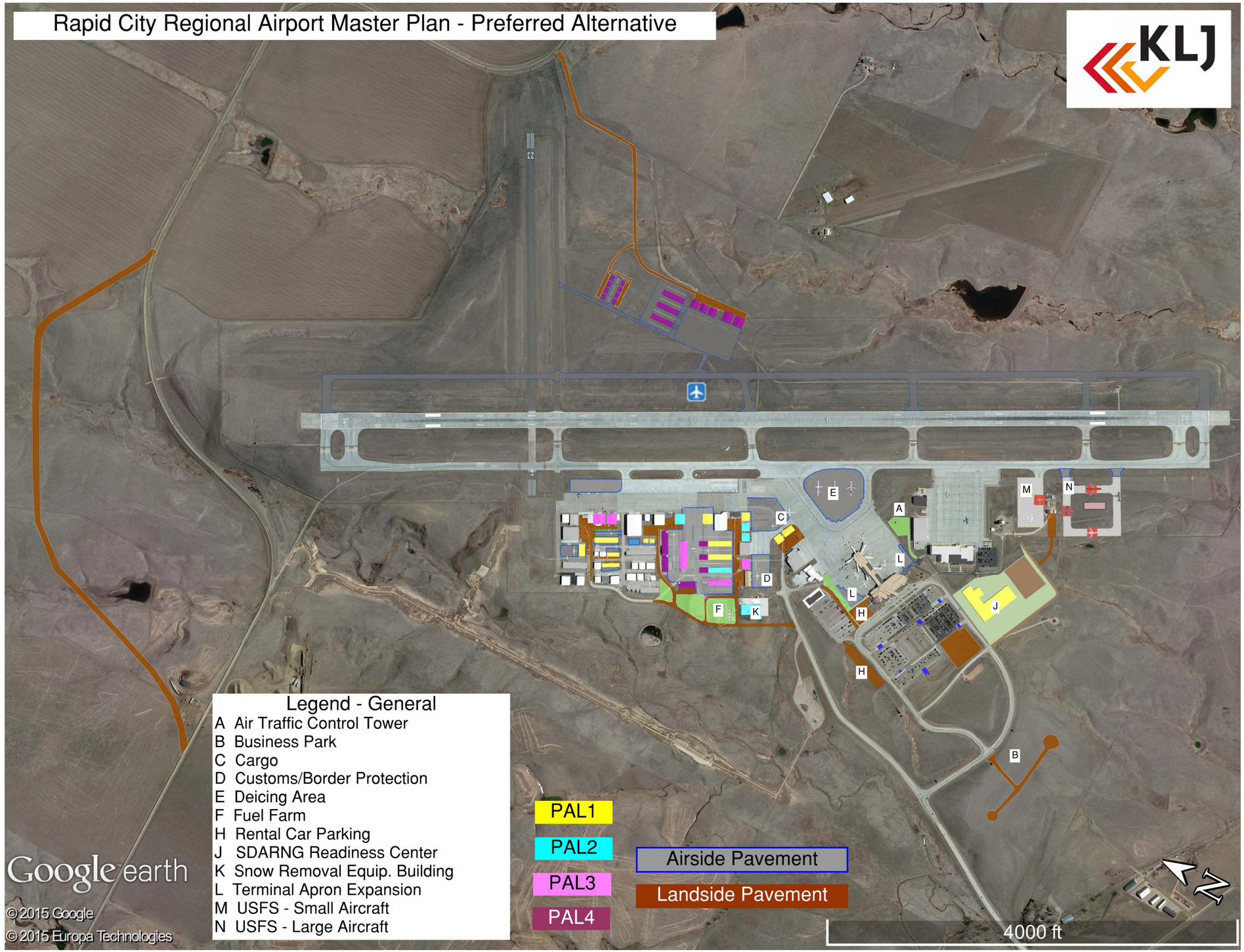
An internal perimeter road provides secure airside access for authorized vehicles and minimize the need to cross active runways and taxiways. The current perimeter road is paved for a small portion around the Rapid City airport. The remaining portions are a mixture of all weather and trail. It is recommended that the airport continue to add material to create all weather roads around the perimeter and have the roads paved when they are within 400 feet of connecting with any airfield pavement.

Airport Utilities

The location and type of airport utilities for facility development will be considered at the time of facility development. Development must consider the location and capacity of water main lines to assure sufficient fire protection is in place. The existing water system and city building codes will have an effect on the types of construction for buildings at the airport.

The sanitary sewer facility for the airport currently is a lagoon system. Connection to the City of Rapid City's water reclamation facility should be included in the airport's long term plans and coordinated with the City.

Exhibit 5-20 Preferred Alternative



Preferred Development Strategy

Table 5-15 Preferred Development Strategy presents a draft phasing plan. This serves as an overall summary of the preferred alternatives for each functional area. This plan is subject to change from refinements in the **Chapter 6: Implementation Plan** based on Airport Capital Improvement Plan (AICP) financial considerations. The timing of improvements based on Planning Activity Levels should be adjusted accordingly should activity levels change from the approved forecast. The strategy assumes facility maintenance and rehabilitation will be completed as necessary.

Table 5-15 – Preferred Development Strategy

	Near-Term 0-5 Years PAL 1	Mid-Term 6-10 Years PAL 2	Long-Term 11-20 Years PAL 3 & 4	Ultimate 20+ Years Beyond PAL 4
Airfield	• Replace PAPIs • Remove Taxiway B between the Apron and Taxiway A	• Realign Long View Road outside of Runway 14 RPZ • Precision Instrument Approach for Runway 14 • Replace ATCT	• Add 25' paved shoulders for Runway 14-32 • Expand Blast Pad for Runway 32 to 200' x 200'	• Construct East Parallel Taxiway for Runway 14-32
Passenger Terminal	• Add inline Baggage Screening • Add new Baggage Makeup Area • Deicing Apron Phase I (2 positions)	• Expand terminal apron to square off corners	• Deicing Apron Phase II (1 position)	
General Aviation & Other	• Add 3 10-unit T-Hangars • Add 3 conventional hangars • Add 9 small box hangars • Add Cargo Building and Cargo Hangar • USFS Phase I	• Expand Apron on North end by 7,000[7] square yards • Add 1 10-unit T-Hangar • Add 2 Conventional Hangars • SDARNG Readiness Center • USFS Phase II	• Add 1 10-unit T-Hangar • Add 3 3-unit T-Hangars • Add 3 Conventional Hangars • Add 1 8-unit Exec T-Hgr • Add 10 small box hangars • USFS Phase III	East Side • Add 22,500 square yards of apron • Add 5 Conventional Hangars • Add 3 10-unit T-Hangars • Add 8 small box hangars
Landside	• Public Parking Lot Entry/Exit Shelters	• Realign Road for Rental car lot (for Terminal Apron expansion) • Pave Additional public parking • Add storage lot for rental cars	• Site work for non-aeronautical area	
Support	• New General Aviation Road	• Relocate Maintenance and SRE facilities • Sanitary Sewer connection	• Prepare CBP facility	

Source: KLJ Analysis

[7] The Runway Visibility Zone would restrict some of this apron unless the threshold to Runway 5 were relocated by at least 105 feet. Any relocation of the Runway 5 threshold must consider the close proximity of Taxiway A and Runway 14-32 as well as issue of removing any direct taxiway connections from the apron to Runway 5 and 14-32.