3.0 Facility Requirements

Determining facility requirements is the next essential step in the airport master planning process[1]. The purpose of this chapter, "Airport Facility Requirements" is to determine the needs of the airport based on demand identified in Chapter 2 – Forecast of Demand.

To the reader the title implies these are the facilities "required" to maintain a viable and safe airport. It is true that in an ideal world providing for the requirements to meet the projected demand is a reasonable expectation. On the other hand, the physical and/or financial resources available may not be allowed to fully develop under the circumstances. Nonetheless, before the planning can take place to achieve what is feasible it is important to understand the ultimate facility requirements scenario. To this end, this effort was conducted without consideration of any constraints, that is, to understand the requirements under an ideal situation. The physical, financial, and environmental impacts that may ultimately constrain the ability for achieving the requirements are considered in the future Alternative Analysis and Implementation Working Papers. For those areas that are determined to be inadequate, the Master Plan Update project will identify the required facilities to meet the demand, and the alternative methods to provide the necessary capacity. This Facility Requirements chapter compares the forecast to the latest airport industry standards and FAA design guidance[2].

The assessment of facility requirements includes the following major elements:

- Airfield System Capacity, including Design Aircraft;
- Airside Facility Requirements;
- Landside Facility Requirements;
- Airline Terminal Requirements;
- Airport Access; and
- Support Facilities.

Airport facility improvements are justified for several reasons:

- To meet the existing or forecasted demand of the facility, in term of level of activity and type of activity;
- To meet FAA design standards or criteria, most related to enhancing airport safety;
- To insure a well maintained facility; and
- To enhance operational efficiency.

The results of the analysis in this chapter produce a list of the facility requirements needs which are an integral part of the subsequent evaluation in Chapter 4 – Alternatives Analysis.

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1 Reference: FAA Advisory Circular 150-5070-6B *Airport Master Plans*, July 29, 2005
2 Reference: FAA Advisory Circular 150-5300-13C *Airport Design*, March 2007

3.1 Airfield System Capacity

This section of the chapter will detail facility requirements for the Design Aircraft, Design Standards, Wind Coverage, Runway Safety Areas, Pavement, Pavement Markings, Airport Fencing and Runway Length.

3.1.1 Design Aircraft

The FAA uses the Airport Reference Code (ARC) to relate airport design criteria to operational and physical characteristics of the aircraft currently using or projected to use the airport. The critical aircraft is that aircraft with the most demanding (i.e. largest) critical dimensions and highest approach speed that consistently (at least 500 operation per year) uses the airport. These codes are summarized in Table 3.1.

Table 3.1
Airport Reference Codes

Approach Category	Minimum Speed	Maximum Speed (knots)
A	≤ 0	< 91
B	≤ 91	< 121
C	≤ 121	< 141
D	≤ 141	< 166
E	≤ 166	< N/A
Design Group	**Minimum Wing Span (feet)**	**Maximum Wing Span (feet)**
I	≤ 0	< 49
II	≤ 49	< 79
III	≤ 79	< 118
IV	≤ 118	< 171
V	≤ 171	< 214
VI	≤ 214	262
Source: FAA AC 150-5300, Airport Design		

The Airport Reference Code (ARC) for PRC is C-III. This indicates that aircraft with a wingspan of less than 118 feet and approach speeds slower than 141 knots are able to operate in safe conditions on Runway 3R- 21L. Runway 3R-21L has FAA dimensional standards to meet C-III, Runway 3L-21R meets ARC B-I, and Runway 12-30 meets ARC B-II. As part of this analysis the runway length meeting the critical aircraft requirements standards for Runway 3R-21L are assessed.

The 2007 operations data showed that the majority of the fleet operating at PRC fell within Category A and B and the forecast showed that this will be maintained in the future. Aircraft in these categories varies from Group I to Group III. Additionally, more than 1% of the total operations were attributed to aircraft in the C category, from Group I to Group III. At present, the Q-400, a C-III aircraft, has been introduced to the PRC fleet mix, and is expected to conduct more 1,460 operations per year. While the B-1900, a B-III aircraft, continues to conduct thousands of operations at PRC. Additionally, at PRC the United States Forest Service (USFS) Prescott Fire Center and Henry Y. H. Kim Aviation Facility continue to operate large aircraft tankers during the fire season, such as the P-3 Orion and C-130. Although, the number of operations conducted by the USFS fleet it is not sufficient to be considered the critical aircraft (i.e., at least 500 annual operations), their presence supports the need to continue to plan and maintain PRC as ARC C-III.

The 1997 Master Plan had identified the Boeing 737, a C-III aircraft, as the Design Aircraft for PRC. As part the planning process the critical aircraft was re-evaluated to determine if another aircraft more accurately addressed the aviation demand need of the airport.

While it is clear that PRC should continue to be an ARC C-III facility it important to identify the critical aircraft that reflects the true aviation planning need of PRC.

The commercial forecast for PRC identified that the number commuter aircraft and regional jet market will continue to grow in relation to the high growth of the population in the Prescott Metropolitan Service Area (MSA) and so will the seating capacity and range of the commercial flights offered at PRC.

Based upon the expectation that the B-1900 is soon expected to be replaced by more reliable and efficient aircraft, and on current trends in the regional carrier market, it is anticipated that regional jet will play a bigger role in PRC's future (specifically in the 40-70 seat capacity segment). In the Western region, the regional jet predominantly used in this category are the CRJ 200 and CRJ 700 currently operated by Mesa Airline, SkyWest, Delta Connections, Northwest Airlines, Midwest Connect, ASA, Horizon Air and others. Table 3.2 illustrates a few examples of the type of aircraft that will operate at PRC in the future.

After reviewing the demand forecast, the types of aircraft that currently use the airport and the existing dimensional layout of features such as runways, taxiways, and safety areas, it was determined that the ARC for PRC will remain C-III throughout the planning period. After discussions with airport representatives and performing a runway length analysis (see Appendix 2), it was determined that the CRJ 700 is the most airfield demanding aircraft expected to operate regularly in PRC. Therefore the critical design aircraft for Runway 3R-21L will be the CRJ 700 (ARC C-III). The runway requirement for this new critical aircraft will be evaluated.

Runway 3L-21R, as per the 1997 Master Plan will continue to be planned to meet ARC B-II criteria and Runway 12-30 will remain as ARC B-II.

Table 3.2
Sample of Future PRC Design Aircraft

Example	Aircraft Type	ARC
	Q-400 Wingspan:92.25 ft MTOW: 64,500 lbs Approach Speed: 125 knot	B-III
	CRJ 200 Wingspan:76.3 ft MTOW: 47,450 lbs Approach Speed: 130 knot	C-II
	CRJ 700 Wingspan:85.04 ft MTOW: 71,750 lbs Approach Speed: 140 knot	C-III
	ERJ 145 Wingspan: 65.9 ft MTOW: 48,400 lbs Approach Speed: 110 knot	C-II

3.1.2 Airfield Capacity Analysis

The airfield capacity analysis identifies potential capacity and delay issues associated with the airfield infrastructure and projected demand levels. The level of aircraft activity that can be accommodated at an airport is mainly a function of the runway configuration. The number, length, and orientation of the runways are important factors in determining an airport's operational capacity. The analysis determines whether the airport's existing runway/taxiway system has the capacity to meet forecasted demand. The analysis of the runway and taxiway system at PRC was based upon methodologies in FAA AC 150/5060-5 *Airport Capacity and Delay* as well as utilizing the results of the analysis conducted in the Arizona State Aviation Need Study (SANS 2000).

For PRC, the SANS 2000 identified 326,400 operations for their Annual Service Volume (ASV). Since the airport configuration has not changed since the SANS was completed, this Master Plan effort will utilize this ASV which is based on the current runway configuration, weighted hourly capacity, ratio of annual demand to average daily demand during peak month, and the ratio of average daily demand to average peak hour demand during the peak month.

As a result of the projected demand for this Master Plan effort, Table 3.3 presents the calculation of the Demand to Capacity Ratio during the planning horizon 2007 through 2027:

Table 3.3
PRC Demand to Capacity Ratio

Year	Operations	ASV Operations	Demand to Capacity Ratio
2007	230,615	326,400	70.6%
Forecast			
2012	250,706	326,400	76.8%
2017	276,961	326,400	84.8%
2027	328,018	326,400	100.4%

The FAA utilizes a demand to capacity ratio of an airport's estimated ASV of approximately 60% to determine when an airport may experience operational delays. When an airport approaches this 60% target, plans should be conducted to increase an airport's capacity. As is shown in Table 3.3, PRC's ratio is currently well above the 60% target throughout the planning period and is expected to reach 100% by 2027, therefore airport capacity improvements are recommended.

Improvements to the runways and taxiways are recommended to reduce the potential for runway incursions; and therefore, may also have the effect of improving capacity.

3.1.3 Airport Design and Operational Safety Standards

The inventory assessment, demand forecast, and review of current design standards will determine the runway and taxiway improvements needed. FAA Advisory Circular 150/5300-13 entitled, *Airport Design*, sets forth recommended runway and taxiway design standards for all airports. The design standards for the current and future airport facilities are set forth in Table 3.4 below. Included on this table are the existing conditions, the future runway dimensions for design aircraft. Also included are the existing conditions and the dimensions that will be in effect if the recommended improvements at the airport occur.

Also the airport must provide a safe operating environment for aircraft. The FAA establishes protection areas around the runways to help ensure such an environment. These areas are:

- **Runway Safety Areas (RSA)** – The RSA is a prepared surface that surrounds the runway (and extends a specified distance beyond it) that is clear of obstructions. Keeping the RSA clear helps minimize damage to aircraft in the event of an accident.

- **Runway Protection Zone (RPZ)** – The RPZ is a trapezoidal area located off each runway end. The RPZ should be clear of obstructions to the greatest extent possible, to enhance the protection of people and property on the ground.

- **Object Free Area (OFA)** – A ground area surrounding runways, taxiways and taxilanes which is clear of objects except for those whose location is required by function.

Table 3.4
PRC Design Standards

FAA Design Category	Runway 3R -21L	Runway 3L-21R	Runway 12-30
Approach Category and Design Group End	C-III	B-II	B-II
Runway Width (ft)	150	75	75
Percentage Effective Gradient	0-1.5%	0-2%	0-2%
Runway Shoulder Width (ft)	20	10	10
Runway Blast Pad Length (ft)	200	150	150
Runway Blast Pad Width (ft)	140	95	95
Runway Safety Area Width (ft)	500	150	150
Runway Safety Area - Distance Beyond Runway End (ft)	1,000	300	300
Runway Object Free Area Width (ft)	800	500	500
Runway Object Free Area – Distance Beyond Runway End (ft)	1,000	300	300
Runway Obstacle Free Zone Width (ft)	400	400	400
Runway Centerline to Taxiway Centerline Distance (ft)	400	300	300
Runway Centerline to Nearest Parking Area	500	400	400
Taxiway Width (ft)	50	35	35
Taxiway Shoulder Width (ft)	20	10	10
Taxiway Safety Area Width (ft)	118	79	79
Taxiway Object Free Area Width (ft)	186	131	131
Taxiway Centerline to Fixed or Moveable Object (ft)	93	65.5	65.5
Taxiway Centerline to Parallel taxiway	152	105	105
Building Restriction line Setback[3]	745	395	395

3.1.4 Wind Coverage

FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, states that an airport's runways should be oriented such that aircraft can take-off and land into the prevailing wind with minimal crosswind exposure. The AC also states that a single runway, or a runway system, should provide 95% wind coverage. Thus, the goal at PRC is to achieve 95% coverage or better.

Wind coverage is calculated using a wind rose, which graphically depicts wind data collected from the National Oceanographic and Atmospheric Administration (NOAA). The wind rose is essentially a compass rose with graduated concentric circles representing wind speed. Each box

[3] The BRL setbacks are based on providing 7:1 transitional slope, RVZ and protected areas clearance over 35 feet.

in the wind rose represents a compass direction and, when filled, indicates the percentage of time wind travels in that direction at that speed.

Since prevailing wind patterns do not usually change, this effort will utilize the existing wind data for PRC. The wind roses are computed based on the following three categories:

- Visual Flight Rules (VFR) – (ceiling 1,000' and visibility 3 miles)
- Instrument Flight Rules (IFR) – (ceiling less than 1,000' and visibility less than 3 miles)
- All Weather – VFR and IFR combined

Since aircraft characteristics and performance can vary, wind coverage data is presented for both 13 and 16 knots. Table 3.5 presents the percent of all weather wind coverage at PRC for each runway and combined. VFR conditions occur approximately ninety-eight (98) percent of the time and IFR conditions two (2) percent.

Table 3.5
PRC All Weather Wind Coverage

Runway Identifier	13 Knots	16 Knots
3/21	98.03	99.57
12/30	94.19	98.23
Combined 3/21 and 12/30	99.91	99.99
Source: Data from national Climatic Data Center. Output provided by FAA Airport Design Program, Standard Wind Analysis.		

Based on this wind data, the current runway configuration at PRC provides enough wind coverage to meet the FAA guideline of 95% all weather wind coverage.

3.2 Airside Facility Requirements

This section contains information regarding airside improvements that should be considered for the entire airfield system at PRC. First, consideration was made as to the approximate runway length for PRC based upon the existing and future role of the airport, runway and taxiway standard compliance, followed by an analysis of the runway safety, protection and obstruction surfaces.

3.2.1 Runway Length Requirements

The runway length required for an airport is based on standards presented in FAA AC 150/5300-13, PRC Aviation Demand Forecast, and FAA AC 150/5325-4A, *Runway Length Requirements for Airport Design*. The recommended length for a primary runway at an airport is determined by considering either the family of airplanes having similar performance characteristics, or a specific aircraft requiring the longest runway.

The FAA mandates that for aircraft with a Maximum Takeoff Weight (MTOW) of less than 60,000 lbs, the recommended runway length is determined according to a family grouping of airplanes. However, for regional jets like the CRJ 700, the runway length recommended is a function of the most critical individual aircraft's takeoff and landing operating weights, which depends on wing flap settings, airport elevation and temperature, runway surface conditions (dry or wet), and effective runway gradient.

The runway length recommended by the FAA is obtained by the two conditions: (1) weight category of aircraft and (2) by performance charts provided or published by the aircraft manufacturers (i.e., Canadair's Airport Planning Manual). Both takeoff and landing runway length requirements must be determined with applicable length adjustments in order to determine the recommended runway length. The longest of the takeoff and landing runway length requirements for the critical design aircraft under evaluation becomes the recommended runway length. This design procedure must be applied to the information/performance charts (ref: FAR 150/5325-4b, par 402).

As part of the runway length analysis for PRC, the FAA Airport Design Computer Program 4.2D and procedures outlined in FAA AC 150/5300-13 were used to calculate the Runway 3R-21L length requirement for planning purposes. The program includes an aircraft fleet profile designed to be representative of the small and large aircraft that comprise the general aviation aircraft fleet in the United States. The runway length analysis was developed as part of a separate task and details are included in Appendix 2**.**

Table 3.6 presents the required runway lengths for PRC based on the FAA Airport Design Computer Program 4.2D.

Table 3.6
PRC Runway Length Analysis

Airport Input Data	
Airport Elevation (MSL)	5,045
Mean daily temperature of the hottest month	90°
Maximum difference in runway centerline elevation	62'
Runway Length Recommended for Airport Design	
Small airplanes with approach speeds of less than 30 knots	450
Small airplanes with approach speeds of less than 50 knots	1,200
Small airplanes with less than 10 passenger seats:	
75 percent of these small airplanes...	4,640
95 percent of these small airplanes...	6,240
100 percent of these small airplanes...	6,410
Small airplanes with 10 or more passenger seats	6,410
Large airplanes of 60,000 pounds or less:	
75 percent of these large airplanes at 60 percent useful load	7,300
75 percent of these large airplanes at 90 percent useful load	9,220
100 percent of these large airplanes at 60 percent useful load	11,400
100 percent of these large airplanes at 90 percent useful load	11,620
Source: FAA Airport Design Computer Program 4.2AD and FAA AC 150/5300-1.	

In addition to the FAA Program, the Airport Planning Manual for the CRJ 700 was reviewed and its runway length requirements are summarized below in **Table 3.7**.

Table 3.7
Airport Planning Manual Specification for CRJ 700

Airport Input Data	
Mean Temperature (Hottest Month)	90°F
Airport Elevation above MLS	5,045 ft
Maximum Difference in Centerline Elevation	62'
Aircraft Weight Data	
Maximum Design Weight (landing)	67,000 lbs
Maximum Design Weight (takeoff)	75,000 lbs
Runway Length Recommended for Airport Design	
Landing Runway Length (wet)	6,200'
Landing Runway Length (dry)	5,400'
Takeoff Runway Length	10,570'
Source: Canadair CRJ 200 Airport Planning Manual	

Based upon the analysis performed, the existing primary Runway 3R-21L, currently 7,616 feet long, should be extended 2,954 feet. Runway 3R has a displaced threshold of 790 feet, leaving a landing distance of 9,780 feet. The feasibility of this runway extension and relative taxiway will be analyzed in the Alternative Analysis Chapter.

Runway 3L-21R should also be expanded 1,428 feet and widened 15 feet to satisfy the runway requirement of 100% of B-II fleet[4]. The feasibility of this runway extension and relative taxiway will be analyzed in the Alternative Analysis Chapter.

Runway 12-30 currently satisfies the separation standards for B-II class aircraft. However, it satisfies only the runway length requirement of 75% of the small aircraft fleet. At this time the current runway length for the crosswind runway is sufficient to meet the PRC airfield requirements.

3.2.2 Runway/Taxiway Design, Safety and Separation Standards

As discussed earlier, much of the infrastructure for the primary runway has been designed and constructed to meet C-III standards. The existing runway and taxiway infrastructure and separation requirements meet or exceed the required standards with only few exceptions. Tables 3.8 and 3.9 indicate which dimensional and separation criteria are met and which need improvements for each runway and relative taxiway. All rehabilitations and new construction will be designed to at least the required standards.

[4] FAA AC 150/5325-4B par 205 states that for airport above 3,000 feet, 100% of fleet chart must be used when determining runway length requirements.

Table 3.8
PRC Runway Design, Separation and Safety Standards Compliance

Runway	**3R**	**21L**	**3L**	**21R**	**12**	**30**
Category	**Meets Planned Standards**					
Approach Category and Design Group End	C-III	C-III	B-II	B-II	B-II	B-II
Runway Width (ft)	Yes	Yes	**No**	**No**	Yes	Yes
Percentage Effective Gradient	Yes	Yes	Yes	Yes	Yes	Yes
Runway Safety Area Width (ft)	Yes	Yes	**No**	**No**	Yes	Yes
Runway Safety Area - Distance Beyond Runway End (ft)	**No**	Yes	**No**	**No**	**No**	Yes
Runway Object Free Area Width (ft)	Yes	Yes	**No**	**No**	Yes	Yes
Runway Object Free Area – Distance Beyond Runway End (ft)	Yes	Yes	**No**	**No**	Yes	Yes
Runway Obstacle Free Zone Width (ft)	Yes	Yes	**No**	**No**	Yes	Yes
Runway Obstacle Free Zone – Distance Beyond Runway End (ft)	Yes	Yes	**No**	**No**	Yes	Yes
Runway Centerline to Taxiway Centerline Distance (ft)	**No**	**No**	**No**	**No**	**No**	**No**
Runway Centerline to Nearest Parking Area	**No**	**No**	Yes	Yes	**No**	**No**
Source: FAA AC 150/5300-13 Airport Design						

Based upon the above separation standards, Runway 3R-21L does not satisfy all criteria. Runway 3L-21R currently does not meet ARC B-II standards. Additionally, Runway 12-30 does not satisfy all criteria. The feasibility of implementing airfield improvements required to meet the design standards will be explored in the Alternatives Analysis Chapter.

Table 3.9
PRC Taxiway Design, Separation and Safety Standards Compliance

Taxiway	**A**	**B**	**C**	**D**	**E**	**F**	**H**
Category	**Meets Planned Standards**						
Design Standard	B-II	B-II	C-III	C-III	B-II	B-II	C-III
Taxiway Width (ft)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Safety Area Width (ft)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Object Free Area Width (ft)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Centerline to Fixed or Moveable Object (ft)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Centerline to Parallel Taxiway	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Source: FAA AC 150/5300-13 Airport Design							

With regard to the taxiway system, all standards were found to be satisfactory for Taxiway width, Safety Area width, and Object Free Area width. The previous Master Plan identified the need for high speed taxiway exits and connectors for capacity enhancements which will be explored in the Alternatives Analysis Chapter.

3.2.3 Runway /Taxiway Pavement Conditions, Marking and Lighting

Both Runway and Taxiway Pavement Conditions were found overall to be in good condition and well maintained under the ADOT Pavement Preservation Program. The load bearing capacity of the airfield was found sufficient to meet current and future demand. However, special consideration will be given to the feasibility to increase the pavement strength on the primary runway to 175 thousand pounds with dual tandem in the Alternatives Analysis Chapter.

Taxiway lighting was found insufficient in most of the taxiway system, especially for Taxiway E and H, which is inadequately equipped with reflectors. Taxiway F and D have been already partially equipped with LED lighting through an FAA pilot program. Due to the high volume of student operations and less experienced pilots, the use of LED taxiway lighting throughout the airfield and enhanced pavement markings are deemed necessary to increase airfield safety. The feasibility of implementing these safety enhancements will be explored in the Alternative Analysis Chapter.

3.2.4 Runway Safety Areas, Object Free Areas, and Runway Protection Zones

The Runway Safety Area (RSA) is a prepared surface that is clear of obstructions, structures, roads and parking areas. However, FAA equipment is permitted on frangible mounts (if required by function). The 2005 PRC Runway Safety Area Standards Evaluation Report identified several deficiencies summarized in **Table 3.10**.

Table 3.10
PRC Runway Safety Area Deficiencies

	Existing Conditions					
Runway	3R-21L		3L-21R		12-30	
ARC	C-III		B-II		B-II	
Approach	Non-Precision/ Precision		Visual/Visual		Non-Precision/Visual	
Runway End	3R	21L	3L	21R	12	30
RSA Width (ft)	500	500	120[4]	120[4]	150	150
RSA Length Beyond Runway End (ft)	588[1]	1000	80[2]	240[4]	220[3]	300

[1] Intersection with localizer antenna, perimeter fence at 640 ft, Club House Dr. at 650 ft and Golf Course
[2] Intersecting with rising terrain with a six percent slope
[3] Declining terrain and intersecting with perimeter fence
[4] Existing dimensions are base on ARC B-I standards.

The current RSA dimensions for Runway 3L-21R will need to be re-designed to meet the ARC B-II standards.

Additionally, the Object Free Area (OFA) should be clear of objects except for whose location is required by function. The OFA for Runway 3L-21R, Runway 3R and Runway 12 are found to be deficient due to terrain, fencing and other infrangibly non navigational objects.

The Runway Protection Zone (RPZ) should be clear of obstructions to the greatest extent possible, to enhance the protection of people and property on the ground. The FAA recommends that the RPZ be kept clear by purchasing the property within it, or by acquiring avigation easements. All RPZs are within airport property or the Airport Sponsor has acquired the appropriate avigation easements.

The Alternatives Analysis will evaluate the improvements required to meet all RSA, OFA, and RPZ standards.

3.2.5 NAVAID, Visual Aids, and Instrument Approaches

Airport navigational aids, or NAVAIDS, provide electronic navigational assistance to aircraft for approaches to an airport. NAVAIDS are either, visual approach aids or instrument approach aids. The types of approaches available at an airport are based on the NAVAIDS that are provided.

Instrument approaches are generally designed such that an aircraft, in poor weather conditions, by means of a radio, Global Positioning System (GPS), or an internal navigation system and with no assistance from air traffic control, can navigate to and land safely at an airport. Approach procedures are classified into various categories to include a precision approach, precision Approach Procedure with Vertical guidance (APV) and non-precision approaches. A precision approach is an instrument approach that provides the pilot with both lateral and vertical guidance information. An APV approach is an instrument approach that provides the pilot both course and vertical path guidance information, but does not conform to ILS system performance standards. A non-precision approach provides the pilot with course information only. By moving towards greater levels of precision and approach lighting, an airport can improve the margin of safety for the pilot under adverse weather conditions.

Several types of precision instrument approach technologies are available to airports. They include systems such as an Instrument Landing System (ILS), Microwave Landing System (MLS), GPS (with vertical navigation via Wide Area Augmentation System (WAAS)/Local Area Augmentation System (LAAS)). APV approach technologies include the WAAS based Localizer Performance with Vertical Guidance (LPV), Lateral Navigation/Vertical Navigation (LNAV/VNAV) and Barometric Vertical Navigation (Baro-VNAV) approaches. Non-precision approach technologies include the VHF Omni-directional Radio Range (VOR), Non-Directional Beacon (NDB), Localizer (LOC), LDA Simplified Directional Facility (SDF) or Radio Navigation (RNAV). All of these types of technologies have allowed the FAA to design a variety of approach procedures to help ensure the safety of aircraft during various phases of flight and poor weather conditions.

FAA funding for a new NAVAID and approach procedure is based upon demonstrating the associated need, practicality, safety benefits, and expected aviation activity at the airport. In developing a new approach procedure, the FAA considers the accuracy of the navigational aid, penetrations to the Part 77/TERPS airspace surfaces, an airport's landing surface (runway length, lighting, markings, design criteria, etc.), and other factors as outlined in the FAA's Advisory Circular 150/5300-13, Airport Design. It is important to note that the FAA indicates a significant reduction in minima (i.e., ¼ mile reduction in visibility and/or 50 foot reduction in decision altitude or minimum descent altitude) would constitute a new approach procedure.

GPS and other GPS augmented technology (e.g., WAAS/LAAS) can ultimately provide the airport with the capability of establishing new instrument approaches at minimal cost since there is not a requirement for the installation and maintenance of costly ground-based transmission equipment. To accommodate these type approaches, the airport landing surface must meet specific standards as outlined in FAA AC 150/5300-13, Airport Design. The FAA requires that the airport must have a minimum runway length of 3,200 feet, but states that airports having runways as short as 2,400 feet could support an instrument approach if the lowest Height Above Threshold (HAT) is based on clearing a 200-foot obstacle within the final approach segment. The following tables indicate the necessary HAT, runway length, runway markings, approach lighting, and design criteria required to implement a new instrument approach.

A more precise approach system usually results in lower operating minimums. Essentially, lower operating minimums are achieved by increasing precision of the navigational system.

Tables 3.11, 3.12, and **3.13** summarize NAVAID requirements for various approaches as described above. They are based on guidance contained in 150/5300-13, *Airport Design*, and F.A.A. Order 7031.2C, Airway Planning Standards Number One-Terminal Air Navigation Facilities and Air Traffic Control Services.

Table 3.11
Approach Procedure with Vertical Guidance – Approach Requirements

Visibility Minimums	<3/4-statute mile	<1-statute mile	1-statute mile	>1-statute mile
Height Above Touchdown (ft)	250	300	350	400
TERPS Paragraph 251	34:1 clear	20:1 clear	20:1 clear or penetrations lighted for night minimums (see AC 70/7460-1)	
Precision Object Free Zone	Required	Recommended		
Airport Layout Plan	Must be on approved ALP			
Minimum Runway Length	4,200 ft. paved	3,200 ft. paved	3,200 ft.	
Runway Marking	Non-precision		Non-precision	
Runway Edge Lights	HIRL/MIRL		MIRL/LIRL	
Parallel Taxiway	Required		Required	
Approach Lights	Required – ODALS/MALS,SSALS		Recommended	
Runway Design Standard	APV OFZ Required			

Source: Federal Aviation Administration, Advisory Circular 150/5300-13, Chg 10, Airport Design, 9/29/06.

Table 3.12
Non-Precision Approach Requirements

Visibility Minimums	<3/4-statute mile	<1-statute mile	1-statute mile	>1-statute mile	Circling
Height Above Touchdown (ft)	300	340	400	450	Varies
TERPS Paragraph 251	34:1 clear	20:1 clear	20:1 clear or penetrations lighted for night minimums (see AC 70/7460-1)		
Airport Layout Plan	Required				Recommended
Minimum Runway Length	4,200 ft. paved	3,200 ft. paved	3,200 ft.		
Runway Marking	Precision	Non-precision			Visual (Basic)
Runway Edge Lights	HIRL/MIRL		MIRL/LIRL		MIRL/LIRL (Required only for night minima)
Parallel Taxiway	Required		Recommended		
Approach Lights	MALSR, SSALR, or ALSF Required	Required – ODALS/ MALS, SSALS, SALS	Recommended ODALS/MALS, SSALS, SALS		Not Required
Runway Design Standard	< ¾-statute mile approach visibility	≥ ¾-statute mile approach visibility minimums			Not Required

Source: Federal Aviation Administration, Advisory Circular 150/5300-13, Chg 10, Airport Design, 9/29/06.

Table 3.13
Precision Approach Requirements

Visibility Minimums	<3/4-statute mile	<1-statute mile
Height Above Touchdown (ft)	200	
TERPS Paragraph 251	34:1 clear	20:1 clear
Precision Obstacle Free Zone (POFZ) 200'x'800'	Required	Not Required
Airport Layout Plan	Required	
Minimum Runway Length	4,200 ft. paved	
Runway Marking	Precision	Non-precision
Holding Position Signs & Markings	Precision	Non-precision
Runway Edge Lights	HIRL/MIRL	
Parallel Taxiway	Required	
Approach Lights	MALSR, SSALR, or ALSF Required	Recommended
Runway Design Standard	<¾-statute mile approach visibility	≥ ¾-statute mile approach visibility minimums

Source: Federal Aviation Administration, Advisory Circular 150/5300-13, Chg 12, Airport Design, 1/3/08.

PRC offers precision and non-precision approaches through the use of an Instrument Landing System (ILS/DME) and GPS on Runway 21L and VOR/GPS on Runway 12. Based upon the current operations at PRC, the instrument landing equipment is sufficient to meet current demand. The FAA is currently investigating the feasibility of installing an instrument approach to Runway 3R. Additionally, in the future, as operations increase, providing VOR/GPS capability to Runway 21R could be necessary as well as Runway End Identification Lights (REILs). This recommendation will be evaluated as part of the Alternatives Analysis.

3.3 Landside Facility Requirements

This analysis examines landside facility support components. It will estimate the facility demand and compare it with existing facilities to determine future needs for:

- Apron and Hangar Space Requirements
- Passenger Terminal Building
- GA Terminal Building
- Support Facility and Utilities

3.3.1 Apron and Hangar Space Requirements

The analysis of this section assesses the adequacy of these facilities as compared with projected demand. Requirements for GA and corporate aviation rely on many different factors. The requirements in this section rely on the aviation demand forecast numbers from Chapter 2 of this Master Plan. This section will estimate the facility demand and compare it with existing facilities to determine the requirements for:

- Based Aircraft Parking Apron space;
- Itinerant Aircraft Apron space; and
- Aircraft Hangar space.

Aircraft Apron Parking Requirements

Apron requirements were developed for based and itinerant aircraft at PRC. Currently, the aprons are divided into nine areas.

The apron area requirements shown in this section were developed according to the recommendations given in FAA AC 5300-13, *Airport Design*. Consideration must be made to the overall apron requirements for aircraft parking, taxilanes, adjacent taxiways, proximity to buildings and fueling areas. The apron layout should be designed to accommodate all aircraft using the airport, including turbo-prop and jet aircraft. A planning criterion of 2,700 square- feet (300 SY) per based aircraft and 3,240 square-feet (360 SY) per transient aircraft was used, which includes aircraft taxilanes.

For planning purposes, 25 percent of the based aircraft, adjusted for ERAU and other commercial apron, will be used to determine the parking apron requirements specifically for based aircraft.

The aircraft apron parking requirements for based and itinerant aircraft are calculated in the Tables 3.14 and 3.15 respectively. These numbers are derived by using the combined growth forecast scenario (Scenario 2) in order to determine potential facilities required to meet projected demand.

Table 3.14
Based Aircraft Apron Parking Requirements

Based Aircraft	Planning Year			
	2007	**2012**	**2017**	**2027**
Single-Engine	301	329	368	463
Twin-Engine	26	30	34	43
Jet-Engine	3	7	8	11
Helicopters	10	13	15	18
Required No. Positions	78	87	97	122
Required Area (ft^2)	210,600	234,900	261,900	329,400
Existing Area[5] (ft^2)	195,000	195,000	195,000	195,000
Surplus/(Need) (ft^2)	(15,600)	(39,900)	(66,900)	(134,400)

Currently there is no need for additional apron space for based aircraft as the North Ramp is more than 495,000 $ft^{2.}$ However, more than 300,000 ft^2 of the North Ramp has been currently planned to be converted into box hangars, shades, a self fuel and wash rack. Based on future demand and the current waiting list there will be a need for additional tie-down apronspace in the 5-year planning horizon.

To derive the itinerant aircraft apron parking requirements, the Average Day of the Peak Month was used. November was determined to be the peak month, averaging 10.2% of the annual operations. This percentage was applied to the existing and future operations numbers and then divided by 31 to represent an Average Peak Day. Based on a split between historical local and itinerant operations data, Itinerant Peak Day operations were assumed to be 37% of the peak operations. It was then assumed that approximately 47% of the Peak Day Itinerant traffic will need apron parking and 2% hangar parking.

Table 3.15
Itinerant Aircraft Apron Parking Requirements

Requirements	Planning Years			
	2007	**2012**	**2017**	**2027**
Average Peak Day Itinerant Operations	266	305	342	430
Average Peak Day Itinerant Aircraft	142	149	163	194
Required Itinerant Apron (ft2)	460,080	482,760	528,120	628,560
Existing Area[6] (ft2)	240,000	240,000	240,000	240,000
Surplus/(Need) (ft2)	(220,080)	(242,760)	(288,120)	(388,560)

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[5] North Ramp remaining area.
[6] South Apron/Transient Ramp. The new FBO apron to be completed in January 2009 was not included.

Currently only a portion of the South apron is available to itinerant aircraft. Based on current forecast there is an immediate need for additional apron space.

The feasibility of developing additional apron and its location will be considered in the Alternative Analysis Chapter. These aircraft apron requirements will be used when considering future hangar development.

Hangar Space Requirements

Hangar requirements for PRC depend upon the number of based aircraft, type of aircraft, and owner preference. Thus, hangar demand was based on the results of the based aircraft forecast, operational activity, a survey of on-airport aircraft owners, and planning estimates for hangar area requirements.

The trend in general aviation aircraft (single or multi-engine) is toward more sophisticated and consequently, more expensive aircraft. Therefore, many aircraft owners prefer enclosed hangar space to outside tie-downs.

Hangar space requirements by aircraft type can be found in Table 3.16 below.

Table 3.16
Hangar Requirements by Aircraft Type

Aircraft Type	SF per Aircraft	% of Aircraft to Require Hangar Space	T-Hangar	Conventional Hangar
Single Engine	1,200	70%	90%	10%
Multi-Engine	1,800	80%	75%	25%
Turbojet	3,500	100%	0%	100%
Helicopter	3,500	100%	0%	100%

Using the results of the based aircraft forecast, user survey, hangar waiting list, combined with experience at other airports, the number of aircraft that will use hangars was estimated. It is assumed that larger higher value aircraft are more likely to be stored in a hangar, as well as 80% of the based multi-engine aircraft fleet. The results were then adjusted to account for the strong demand of hangar space from approximately 200 people that have been placed on a waiting list and are not occupying a hangar at PRC at this time.

Determining the needs for itinerant aircraft storage can be difficult at most airports, since conditions can vary drastically from one airport to the next. It is hard to establish a realistic relationship between itinerant operations and the need for hangar space. Considering an IFR fleet mix established for PRC that includes high priced sophisticated aircraft, along with weather conditions, requirements for hangar storage throughout the forecast period were estimated and provide 38,500 square feet of itinerant storage by 2027 (as shown in Table 3.17).

Additionally, 10% of the total conventional hangar storage area was estimated for service and maintenance needs, which could include an area dedicated for aircraft washing. The feasibility of dedicating an area of apron for aircraft washing and service will be evaluated in the Alternative Analysis Chapter.

Table 3.17 shows the requirements of T-Hangar, Conventional Hangar, as it relates to the forecast based and itinerant aircraft numbers.

Table 3.17
PRC Based and Itinerant Aircraft Hangar Requirements

Requirements	Planning Years			
	2007	**2012**	**2017**	**2027**
Single Engine *	196	215	240	301
Multi-Engine *	15	17	19	24
Turbojet *	3	7	8	11
Helicopter *	10	13	15	18
Total T-Hagar positions	187	206	230	289
T-hangars/shade (ft^2)	224,400	247,200	276,000	346,800
Existing T-Hagar positions	175	175	175	175
Surplus/(Need) (ft2)	(14,400)	(37,200)	(66,000)	(136,800)
Total Conventional Positions	13	20	23	29
Conventional (ft^2)	45,500	70,000	80,500	101,500
Existing Conventional Positions	N/A	N/A	N/A	N/A
Surplus/(Need) (ft2)	(45,500)	(70,000)	(52,500)	(101,500)
Itinerant Hangar Positions	7	8	9	11
Itinerant Hangar Requirements# (ft^2)	24,500	28,000	31,500	38,500
Existing Itinerant Hangar Positions	N/A	N/A	N/A	N/A
Surplus/(Need) (ft2)	(24,500)	(28,000)	(31,500)	(38,500)
Aircraft Maintenance (ft^2)	7,000	9,800	11,200	14,000

* *Excluding ERAU*
\# *Itinerant aircraft can be accommodated in Conventional hangars*

3.3.2 Commercial Terminal Building

The existing commercial terminal building as identified in the Baseline Conditions chapter has exceeded its normal life cycle, and while it has undergone several remodels and recent additions the need for a new terminal facility is undisputed. The following terminal space requirements shown in **Table 3.18** are grouped in general classification and include items like food and beverages, restrooms, circulations, hold rooms and others that are typically listed in a terminal area study. These requirements for the various terminal areas were determined according to FAA A/C 150/5360-9, and 150/5660-13. Three scenarios were developed based on airline activity levels of operation rather than planning horizon years, and are based on current and forecasted airline operations and fleet mix. All calculations are based on 76% peak hour load factor. The numbers reported in the following table, for each category, represent total square feet needed.

Table 3.18
Terminal Area Requirements

Terminal Areas	Planning Scenarios		
	2007-2012 [1]	**2013-2017 [2]**	**2018-2027 [3]**
Design Peak Hour Enplanements	**86**	**130**	**153**
Peak Hour Passengers	**172**	**260**	**306**
Ticketing Lobby & Queue Area	1,000	2,200	3,000
Public Lobby	800	1,300	1,700
Public Circulation	1,600	2,600	3,500
Baggage Claim Area and Circulation	1,000	1,800	2,400
Restrooms	500	1,000	1,500
Total – Non Sterile Space	**4,900**	**8,900**	**12,100**
Hold Rooms & Circulation	2,900	4,300	5,000
Restrooms	500	800	1,000
Security Screening Area and Offices	3,000	3,200	3,500
Airline Operations and Offices	1,000	1,200	1,400
Baggage Make-up	1,000	1,800	2,400
Total – Sterile Space	**8,400**	**11,300**	**13,300**
Rental Car Counter and Office	600	600	800
Restaurant / Food and Beverage	1,600	1,800	2,500
Gift Shop	600	600	600
Other Lease Space	600	950	1200
Total Concession Tenant Space	**3,400**	**3,950**	**5,100**
Mechanical Rooms and Support Space	1,670	2,415	3,050
Airport Staff Office	300	300	500
Minimum Total Area	**18,370**	**26,565**	**33,550**

Note: All figures represent square feet unless otherwise noted.
All figures are based on 76% peak hour load factor.
[1] Fleet Mix Assumption: Two B1900 and One Q400
[2] Fleet Mix Assumption: One B1900, One CRJ and One Q400
[3] Fleet Mix Assumption: Two Q400 and One CRJ

Source: FAA A/C 150/5360-9, Planning and Design Guidelines for Airport terminal Facilities;
FAA 50/5660-13, Planning and Design of Airport terminal Facilities at Facilities at Non-Hub Locations.

Terminal Area Apron

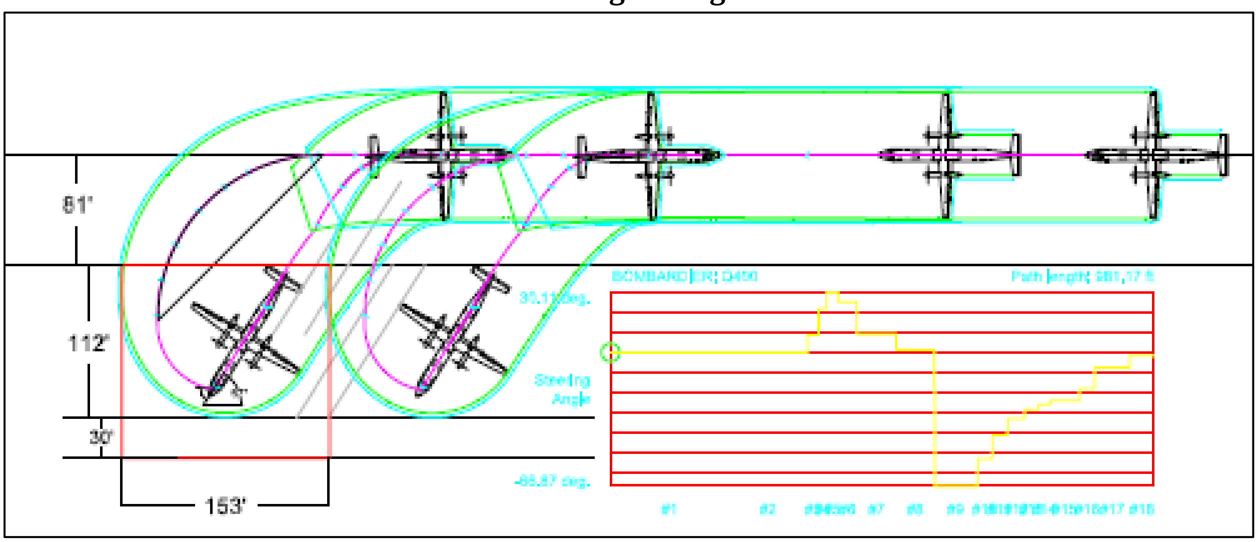
The terminal gate types and apron requirements relate to the wing spans and fuselage lengths of the aircraft which they accommodate and the type of gate operations used. The gate requirements are based on the current and expected fleet mix and activity at PRC type A gates with taxi-in and taxi-out procedures. The aircraft using this gate type are those found in Airplane Design Group

III, wing span between 79 feet (24 m) and 118 feet (36 m). With taxi-in and taxi-out operations aircraft use their own power to taxi into the gate positions and out. Although this type of operation it is less costly operationally, it requires much more apron area and permits a lower number of gates. A fleet mix composed by Dash 8 400 series (Q-400) and Regional Jet (CRG-200) was used to calculate the apron requirements for the terminal. The dimensions, shown in **Figure 1 – Gate Parking Configuration**, of the terminal apron where calculated based on standards found in FAA AC 150/5390-9 in a linear configuration, with parking gates at a 57 degree angle. The minimum terminal apron requirements are summarized in **Table 3.19**.

Table 3.19
Terminal Apron Requirements

Terminal Apron Needs	Planning Scenarios		
	2007-2012	**2013-2017**	**2018-2027**
Number of Gates	3	3	3
Terminal Apron Minimum Dimensions (ft^2)	362x223	418x223	430x223
Terminal Apron Area (ft^2)*	80,726	93,214	95,890

Figure 1
Gate Parking Configuration



Terminal Area Vehicular Parking

Adequate parking should be provided in proximity of the terminal building. At PRC parking should include short-term, long–term as well as parking for concessions and TSA's employees, rental cars and return spaces and a few space reserved for airport administration and maintenance vehicles. Table 3.20 presents the terminal parking requirement based on the current enplanement forecast and standards listed in FAA AC 150-5360-13 *Planning and Design of Airport terminal Facilities at Facilities at Non-Hub Locations.* The figures below are calculated using approximately 400 sf^2, including lanes, per parked automobile.

Table 3.20
Terminal Area Passenger Vehicles Parking

Terminal Vehicles Parking Needs	Planning Scenarios		
	2007-2012	2013-2017	2018-2027
Short Term Parking Positions	20	33	44
Long Term Parking Positions	62	100	133
Concessions	8	8	12
Restaurant Patrons	16	18	25
TSA	5	5	7
Rental Car	12	12	20
Administration and Maintenance	3	3	4
Total Number of Positions	126	178	245
Total Parking Area (ft^2)	50,400	71,200	98,000

3.3.3 General Aviation Terminal Building

The primary users of PRC are general aviation pilots. Therefore, it is appropriate to account for the facility requirement needs to accommodate them. A general aviation terminal building typically accommodates administrative offices, management offices, fix based operator offices, a pilot's lounge, flight planning area, meeting facilities, food services, restrooms and other various spaces. The FAA has developed methods of estimating general aviation terminal requirements. The method, found in FAA A/C 150/5300-13, Airport Design, relates peak period activity to the size of functional area within the building. The GA space requirements were based on providing 75 square-feet per design peak hour pilot/passenger.

The peak hour pilot/passenger was determined by adjusting the average peak hour operation to account for flight school operations that use independent facilities and by calculating an average of 2.5, 2.8 and 3.0 pilot/passenger for the respective 2012, 2017 and 2027 planning horizons as depicted in Table 3.21.

Table 3.21
Recommended Fixed Based Operator Building Area Requirements

FBO Building Needs	Planning Years			
	2007	2012	2017	2027
Avg. Peak Hour Operations	112	122	133	159
Peak Hour Pilot/Passengers	90	98	118	153
Terminal Building Area	3,800	7,350	7,875	9,600

3.3.4 Access Road and General Aviation Parking

Access Road

A description of the current airport roadway and parking areas is provided in Chapter One. As noted in Chapter One, PRC can be accessed via State Route 89. Access is fairly direct and current signage is sufficient. However, as the surrounding communities grow it will be necessary to enhance signage.

On-going concurrent transportation studies are evaluating capacity enhancement alternatives of State Route 89, the realignment of Ruger Road, and Willow Creek Road. Additionally the City of Prescott has recently begun an Airport Area Transportation Plan. Some of the alternatives will have a direct impact to the airport access. As part of the Alternative Analysis Chapter access improvements and the realignment of Ruger Road, which could ultimately provide direct access to the Terminal Area, will be examined.

General Aviation Parking

Based upon the previously discussed peak hour pilot/passenger, the number of based aircraft and transient operations, Table 3.22 lists the requirements for the GA vehicular parking area. The area was calculated on the assumption that one space will be required per peak hour pilot/passenger and that 20% of the based aircraft will require one parking position at any given time. Space requirement are calculated based on FAA AC 150/5360-13 and assume 400 (ft^2) per parking position and includes circulation lanes.

Based on conversations with Airport staff the current parking availability is very limited and has become a concern of many airport commercial tenants as well as for the airport administration. The sites available for additional parking will be identified during the Alternatives Analysis Chapter.

Table 3.22
Recommended GA Vehicular Parking Area Requirements

GA Parking Needs	Planning Years			
	2007	**2012**	**2017**	**2027**
Peak Hour Pilot/Passengers	90	98	118	153
Based Aircraft Positions	68	76	85	107
Total Parking Positions	158	174	203	260
Parking Area (ft2)	63,200	69,600	81,200	104,000

3.3.5 Support Facility Requirements and Utilities

The following section presents an analysis of the facility space requirements for PRC support facilities based upon current growth trend and forecast. This analysis includes:

- Airport Administration;
- Fuel Storage;
- Federal Facilities (ATCT);
- Airport Rescue and Firefighting (ARFF);
- Aircraft Maintenance and Storage;
- Airport Utilities;
- Airport Fencing; and
- Perimeter Road.

Airport Administration

The Airport Administration is located on the south-west side of the airfield and within a two story building. The overall condition of the building is fair and the office space on the first floor has been recently remodeled to accommodate additional administration and maintenance staff. However, the current facility will not be sufficient to support the staffing need of PRC for the next 20 years.

To properly accommodate the needs of the Airport Administration a facility of 5,950 square-feet is the minimum requirement. This facility will accommodate up to 20 employees and will include 6 offices, data storage, break and file/copy room, conference room and restrooms. The feasibility of building, possibly relocating, and combining a new Administration facility with the Maintenance facility will be reviewed in the Alternatives Analysis Chapter.

Airport Administration Parking

Table 3.23 lists the parking requirements based on anticipated staffing levels and additional spaces for visitors, handicap and deliveries. Space requirement are calculated based on FAA AC 150/5360-13 and assume 400 (ft^2) per parking position and includes circulation lanes.

Table 3.23
Recommended Administration Parking Area Requirements

Administration Parking Needs	Planning Years			
	2007	2012	2017	2027
Administration Parking Pos.	14	16	20	28
Parking Area (ft^2)	5,600	6,400	8,000	11,200

Fuel Storage Facility

There are four - 20,000 gallon above-ground fuel tanks. Two tanks contain Avgas (100LL) and two contain Jet-A fuel. Fuel is delivered approximately three times a week during normal operations, and approximately seven times if there is a forest fire in the area. These tanks are now operated by the current FBO.

Typically, fuel storage requirements are based on the average forecasted number of operations and a fuel ratio estimated by analyzing fuel flowage data and by dividing the annual consumption by the estimated annual operations. This results in the estimated average fuel consumption per operation. Table 3.24 shows the aviation fuel requirements for PRC based upon the forecast and the last five-year fuel sales which equals to 4.35 gallons of fuel per operation.

Requirements needed for the fuel farms are to maintain compliance CFR 14 Part 139, NFPA 407 code and with the Underground Storage Tank (UST) Regulation that states “Underground fuel storage tanks installed before December 31, 1988 must be modified or replaced to ensure corrosion, overfill and spill prevention by December 22, 1998”. PRC has met these requirements by removing the underground tanks and by installing 4 above ground tanks.

Table 3.24
Fuel Storage Requirements for PRC

Requirement	Planning Year			
	2007	2012	2017	2027
Operations	230,615	250,706	273,961	328,018
ADPM Operation	744	809	884	1,058
ADPM Fuel in Gallons	2,843	3,091	3,377	4,042
2 Weeks Fuel Storage Reserve	42,638	46,363	50,661	60,632
Existing Tanks Volume	80,000	80,000	80,000	80,000
Additional Fuel Storage Need	(20,000)	(20,000)	(20,000)	(40,000)
ADPM = Average Day, Peak Month				

Although calculations cannot be made that compute an average amount of fuel sold per operation, fuel sales data show that the current fuel capacity at PRC is sufficient to accommodate the number of forecasted operations throughout the planning period, if the current fuel delivery schedule is maintained. Additionally, self-fueling is common at several airports in the region. PRC based aircraft owners have expressed that having a self-fueling station at the airport would be beneficial. The feasibility of this will be considered in the Alternative Analysis Chapter.

Air Traffic Control Tower/Facilities (ATCT)

Since the need of improving the airfield and extending Runway 3R-21L has been identified and the fact that current line-of-sight issues that have prompted the installation of close circuit cameras at the end of Runway 3L-21R and 3R-21L, there is the need to further evaluate the relocation of the ATCT or possibly increase the height tower at its current location. The feasibility of this will be considered in the Alternative Analysis Chapter.

Airport Rescue and Firefighting (ARFF) Equipment and Garage

PRC currently meets the Airport Rescue and Fire (ARFF) Index A Part 139 requirements. Under this requirement, PRC should have at least one vehicle with 500 pounds of sodium- based dry chemical, halon 1211 or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100 gallons for simultaneous dry chemical and AFF application.

The airport has one Part 139 Index B compliant ARFF vehicle stored in at the fire station and one structural vehicle located at the south side of the airfield. The current facility meets the minimum requirements mandated by the FAA. However, FAA CFR 14 Part 139.317 states that: “Within 3 minutes from the time of the alarm, at least one required aircraft rescue and firefighting vehicle must reach the midpoint of the farthest runway serving air carrier aircraft from its assigned post or reach any other specified point of comparable distance on the movement area that is available to air carriers, and begin application of extinguishing agent”.

Currently PRC ARFF barely meets the response time requirement. The extension of the primary runway will move the midpoint further away and the ARFF vehicle will not be able to reach it under 3 minutes. The relocation of the ARFF station closer to the midpoint of the primary runway is recommended. In the Alternatives Analysis Chapter it will be identified as an area of 25,000 ft^2 able to accommodate a new ARFF facility (Index B), apron and employee parking providing a more efficient airfield response.

Airport Maintenance Equipment Storage

Currently most airport maintenance equipment is stored in a hangar adjacent to the Commercial Terminal Building. Due to its current location and space constraints, some of the equipment can not be stored and is parked outside nearby resulting in poor functionality. Additionally, the current facility lacks working space, offices, and common space (i.e., break room) for the maintenance staff.

Due to its current location and the recently developed plans for a new Commercial Terminal Building, Maintenance Building will be "boxed-in" with limited space for expansions and reduced access to the airfield. It is recommended that the maintenance facility be upgraded and relocated to an area that grants easier access to the airfield and out of sight of passengers. It is anticipated that a facility of 11,250 ft^2 should suffice the needs of the airport maintenance staff. The facility would include three (3) large vehicles bays and one (1) small vehicle bay, parts storage room, workshop room, lockers room, conference/training room, and restrooms. The feasibility of relocating the Maintenance Building and combining it with the Administration facility will be considered in the Alternatives Analysis Chapter.

Airport Utilities

As noted in Chapter 1, PRC has access to all appropriate utility services. These services would be readily available and adequate to support any future building constructed to meet future airport demands.

Airport Fencing

During the Airport Inventory inspection it was noted that a large section of the airport fence consisted of inadequate barbed-wired cattle fencing around the end of Runway 30, as well as an approximate 240 foot open gap in the perimeter fence next to the Embry-Riddle apron and the Wolfberg parking lot.

To satisfy Transportation Security Administration (TSA) requirements the open gap has since been enclosed with compliant chain-link fence (six feet tall supported by posts and topped with barbed wire). It is recommended to replace the cattle fence with the same type of compliant fencing. The feasibility of replacing the fence and any additional fencing improvements, with regards to new land acquisitions, will be considered in the Alternatives Analysis Chapter.

Perimeter Road

During the initial site visit it was noticed that the airfield lacks a complete perimeter road within the perimeter fence. Frequently, airport staff are required to utilize taxiways to reach areas located to the north of the airfield, and to cross active runways, increasing the risk for incursions accidents. Additionally, the lack of a proper and complete perimeter makes it difficult to frequently inspect, and to maintain, the security fence for damages or breaches caused by wildlife. While it is recommended to separate, or minimize, vehicular traffic from aircraft movement areas, the feasibility of completing the airport perimeter road will be examined in the Alternatives Analysis Chapter.

3.4 Facilities Requirement Summary

The following Table 3.25 and bulleted list summarizes the requirements, above existing conditions, to be addressed as part of the Alternatives Analysis Chapter of this master plan effort.

Table 3.25
Summary of Airport Facility Requirements

Identified Needs	Planning Years			
	2007	**2012**	**2017**	**2027**
Based Aircraft Apron Parking Positions	78	87	97	122
Based Aircraft Apron Parking Area (ft^2)	210,600	234,900	261,900	329,400
Itinerant Aircraft Apron Parking Positions	142	149	163	194
Required Itinerant Apron (ft^2)	220,080	242,760	288,120	388,560
Total T-Hangar positions	187	206	230	289
T-Hangars/shade (ft^2)	14,400	37,200	66,000	136,800
Total Conventional Positions	13	20	23	29
Conventional (ft^2)	45,500	70,000	80,500	101,500
Itinerant Hangar Requirements (ft^2)	24,500	28,000	31,500	38,500
Aircraft Maintenance (ft^2)	7,000	9,800	11,200	14,000
FBO GA Building Area	3,800	7,350	7,875	9,600
GA Parking Positions	158	174	203	260
GA Parking Area (ft^2)	63,200	69,600	81,200	104,000
Administration building (ft^2)	5,950			
Administration Parking Pos.	14	16	20	28
Parking Area (ft^2)	5,600	6,400	8,000	11,200
Airport Maintenance Equipment Storage	11,250			

Identified Needs	Planning Scenarios		
	2007-2012	**2013-2017**	**2018-2027**
Commercial Terminal (ft^2)	**18,370**	**26,565**	**33,550**
Terminal Apron Area (ft^2)	57,980	70,468	95,890
Commercial Terminal Parking Area (ft^2)	50,400	71,200	98,000

Additional items to be analyzed in the Alternative Analysis include:

- Administration Building relocation;
- Airport Access, roadway realignment;
- Airport Maintenance building relocation siting;
- Approach Lighting System to Runway 12 and 3R;
- ARFF building relocation siting;
- Commercial Terminal siting;
- Conventional Hangar siting and development;
- Expansion and development of new aprons;
- FBO/GA building siting and development;
- High speed taxiway exits;
- Itinerant Ramp relocation and expansions;
- Land acquisition;
- Lengthening of Runway 3L-21R;
- Lengthening of Runway 3R-21L;
- Lengthening of Taxiway A, C and D;
- Lighting improvements for taxiway E;
- Perimeter Fencing improvements;
- Perimeter Road;
- Runway 3L-21R widening;
- Runway Protection Zone Issues for Runway 3R and 3L; and
- T-Hangar and shades relocation.