4.0 FACILITY REQUIREMENTS

4.1 General

The primary objective of an Airport Layout Plan is to graphically depict the airport's existing facilities and those required to meet FAA standards and the airport's requirements based on growth in demand. This drawing then updates the agreement with the FAA as to how the airport will be developed, as well as satisfying the sponsor's requirement to maintain an up-to-date Airport Layout Plan at all times.

In the Forecast chapter, projections were made relative to the type and frequency of aircraft that will utilize Central Colorado Regional Airport over the next twenty years. The objective of the Facility Requirements chapter is to quantify the required facilities to meet the projected demand. Examples of parameters for facilities are Runway Length, Runway Width, Runway Safety Area dimensions, Separation between facilities and obstructions, Apron Area, Hangars, etc. These requirements will establish the foundation for the Capital Improvement Program presented in Chapter Five.

4.2 FAA Design Standards

As mentioned in the introductory section of this chapter, one of the key considerations of any airport planning effort is to evaluate the dimensional standards for airfield layout established by the FAA. **Table 4-1** presents a summary of significant FAA design standards that need to be compared with existing conditions to evaluate whether Central Colorado Regional Airport meets criteria for the aircraft currently being served. The application of these design standards establishes airport geometry. The "critical" or "design" aircraft for airfield geometry during the planning period was identified in Chapter Three of this report to be the Cessna CJ2 business jet. Therefore, the Airport Reference Code for Central Colorado Regional Airport for planning purposes will be B-II. This is a departure from the Master Plan that this plan replaces.

Prior planning forecasted the introduction of commercial service by airlines utilizing the ATR-42 aircraft, which are ARC B-III. However, considering the airline industry is in a general state of contraction, and considering the airlines are moving away from turboprop aircraft in favor of regional jets, the likelihood of airline service to Buena Vista is in doubt. Consequently, the existing ARC of B-II is projected to be adequate for the duration of the planning period, although the airport is well situated to quickly upgrade the facility should future needs warrant.

TABLE 4-1
FAA DESIGN STANDARDS

	Existing R/W 15/33	FAA Standards for ARC B-II w/ Approach Visibility not lower than ¾ mile
Runway Object Free Area		
Width	500'	Same
Length Beyond Runway End	300'	Same
Runway Safety Area		
Width	150'	Same
Length Beyond Runway End	300'	Same
Runway Obstacle Free Zone		
Width	400'	Same
Length Beyond Runway End	200'	Same
Taxiway Object Free Area		
Width	131'	Same
Taxiway Safety Area		
Width	79'	Same
Design Criteria		
Runway Width	75'	Same
Taxiway Width	50' & 35'	35'
Runway Centerline to Parallel T/W Centerline	300'	240'
Runway Centerline to Edge of Aircraft Parking	500'	250'
Taxiway Centerline to Fixed or Moveable Object	65.5'	65.5'

Source: Airport Records, FAA AC 150/5300-13 Thru Change 7, October 1, 2002

4.2.1 Runway Object Free Area (OFA)- A two dimensional ground area surrounding the runway. The runway OFA clearing standard precludes parked airplanes and objects except those whose location is fixed by function such as a navigational aid. In order to meet the standard for the Airport Reference Code (ARC) B-II with approach visibility not lower than ¾ of a mile, the OFA for Runway 15/33 must be 500 feet wide and extend 300 feet beyond each runway end.

The existing OFA for Runway 15/33 does meet the FAA design standards for ARC B-II with approach visibility not lower than ¾ of a mile, measuring 500 feet wide and at least 300 feet beyond the runway end.

4.2.2 Runway Safety Area (RSA)- A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway. The RSA should be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations. The RSA associated with ARC B-II with approach visibility not lower than ¾ of a mile, is 150 feet wide and extends 300 feet beyond each runway end.

The existing RSA for Runway 15/33 does meet the FAA design standards for ARC B-II with approach visibility not lower than ¾ of a mile, measuring 150 feet wide and 300 feet beyond the runway end.

4.2.3 Runway Obstacle Free Zone (OFZ)- The runway OFZ is a defined volume of airspace centered above the runway centerline. The runway OFZ is the airspace above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The standard OFZ for ARC B-II with approach visibility not lower than ¾ of a mile, is 400 feet wide and extends 200 feet beyond the runway end.

The OFZ for Runway 15/33 meets the FAA design standards for B-II with approach visibility not lower than ¾ of a mile, measures 400 feet wide and extends 200 feet beyond each runway end.

4.2.4 Taxiway Object Free Area (TOFA)- A two dimensional ground area adjacent to taxiways. The taxiway OFA clearing standard precludes vehicle service roads, parked airplanes, and objects except those whose location is fixed by function such as a navigational aid. The FAA standard for ARC B-II TOFA with approach visibility not lower than ¾ of a mile, is 131 feet wide centered on the taxiway centerline. This indicates that parked aircraft need to be at least 65.5 feet from the centerline of the nearest taxiway.

The provided TOFA is 131 feet wide and meets required FAA design standards.

4.2.5 Taxiway Safety Area (TSA)- A defined surface alongside the taxiway prepared or suitable for reducing risk of damage to an airplane unintentionally departing the taxiway. The minimum standard TSA for ARC B-II is 79 feet wide.

The provided TSA is 79 feet wide and meets required FAA design standards.

4.3 Design Criteria

4.3.1 Runway Width- The design standards for runway width take into account not only aircraft approach category, but also considers operations conducted during reduced visibility. The FAA design standard for runway width for ARC B-II with approach visibility not lower than ¾ of a mile, is 75 feet.

Runway 15/33 is 75 feet wide and meets FAA ARC B-II standards for runway width.

4.3.2 Line of Sight- FAA Line of Sight standards requires that two points five feet above the centerline of a runway without a parallel taxiway be mutually visible for the entire runway length. For runways with a full parallel taxiway, the standard requires that two points five feet above the centerline be mutually visible for one half of the runway length. Further, there is a requirement that for intersecting runways, points five feet above the centerline must be mutually visible within the Runway Visibility Zone (RVZ).

Line of sight requirements are currently met, however, care must be taken not to create a problem should the runway profile be changed or the runway lengthened in the course of development. Also, if a crosswind runway were to be constructed such that the runways intersected, the RVZ standard would need to be met.

4.3.3 Taxiway Width- Taxiway width is correlated to the physical characteristics of the aircraft design group without respect to the operational characteristics of the airport approach category.

Parallel Taxiway "A", which was the former runway, retains its width at 50 feet wide. Connecting Taxiways "A1" through "A6" were designed for Group II aircraft and measure 35 feet wide.

4.3.4 Runway Centerline to Parallel Taxiway Centerline- this design criterion establishes the minimum separation between the centerline of the runway and the centerline of a parallel taxiway. This separation is determined based upon the ARC. The separation standard for Runways and Parallel Taxiways with an ARC of B-II is 240 feet.

The separation distance between Runway 15/33 and Taxiway "A" is 300 feet and exceeds FAA design standards for ARC B-II.

4.3.5 Runway Centerline to Holdline- This standard provides for marking on pavement and placing signs at locations on taxiways where aircraft hold prior to receiving a clearance to enter the runway. These locations are chosen to ensure that aircraft are clear of the RSA and OFZ during operations by other aircraft on the runway. The standard holding positions for ARC B-II are located 250 feet from the centerline.

The standard holdline position measuring 250 feet is provided for Runway 15/33.

4.3.6 ***Runway Centerline to Edge of Parking Area-*** This standard is designed to allow additional clearance between aircraft parking areas and aircraft operations on the runway, while protecting space between these areas for a parallel taxiway. The FAA design standard for ARC B-II is 250 feet.

Separation between the aircraft parking area and centerline of Runway 15/33 measures 500 feet, exceeding FAA minimum design standards.

4.3.7 Taxiway Centerlines to Fixed or Movable Object- This standard is defined as half of the Taxiway OFA, or portion of the OFA on one side of the taxiway centerline. Therefore, the standard for Group II is one half of 131 feet, or 65.5 feet.

The distance for taxiway centerlines to fixed or moveable objects measures 65.5 feet, and meets FAA design standards for Group II aircraft.

4.4 Far Part 77 – Objects Affecting Navigable Airspace

The Federal Aviation Regulation (FAR) Part 77 defines airport imaginary surfaces. Although not specifically "design standards", these surfaces are geometric shapes which surround every airport. These surfaces determine, in part, the approach minima and compliance to standards for each airport. The imaginary surfaces are defined relative to the runway, the established airport elevation, elevation of the approach end runways, and type of existing or planned approaches for each runway end. Any object, whether natural or man made, penetrating these imaginary surfaces is defined by the FAA to be an obstruction. All natural or man made obstructions, which penetrate FAA Part 77 surfaces should be recommended for marking, lighting, or removal.

Runway 33 at Central Colorado Regional Airport corresponds to dimensional standards for a runway with non-precision instrument approach and visibility minimums greater than one mile. Runway 15 utilizes a visual approach with visibility minimums not lower than one mile.

4.4.1 Primary Surfaces- A surface longitudinally centered on a runway. When the runway has a paved surface, the primary surface extends 200 feet beyond each end of the runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of the primary surface is 500 feet for Runway 15/33.

4.4.2 Approach Surfaces- A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each runway end based on the existing or planned approach. The inner edge of the approach surface for Runway 15/33, is the same width the as the primary surface, 500 feet. The approach surface for Runway End 15 expands uniformly at an upward slope of 20:1, to a width of 1,500 feet at a distance of 5,000. The approach surface for Runway End 33 extends uniformly at an upward slope of 34:1 to a width of 3,500 feet at a distance of 10,000 feet.

4.4.3 Horizontal Surface- The *horizontal surface* is defined as a horizontal plane 150 feet above the established airport elevation. Arcs set the plan dimensions of the horizontal surface from the runway end of the primary surfaces, which are connected by tangents. The radii of the arcs are determined by the runway type, the radius for visual runway measures 5,000 feet and for all other runways the radius is 10,000 feet. The established airport elevation is 7,945 feet MSL; therefore the elevation of the Horizontal surface is 8,095 feet MSL.

4.4.4 Conical Surface- An inclined surface at a slope of 20:1 extending upward and outward from the periphery of the horizontal surface for a horizontal distance of 4,000 feet. The elevation of the outer edge of the conical surface for Central Colorado Regional Airport is 8,295 feet.

4.4.5 Transitional Surface- These surfaces extend outward and upward at right angles to the runway centerline extended at a slope of 7:1 from the sides of the primary surface and approach surfaces until intersecting with the horizontal surface. For precision approach surfaces that extend beyond the limits of the conical surface, the transitional surfaces extend over a horizontal distance of 5,000 feet at right angles to the runway centerline.

The width of primary surface impacts the setback requirement for the Building Restriction Line (BRL), depicted on the Airport Layout Plan (see Exhibit I). The BRL provides the airport with the minimum setback from the runway centerline for permanent structures, such as hangars. Typically the BRL is located where the height of the Transitional surface reaches approximately 35 feet above ground level, or the planned maximum height of buildings closest to the runway.

Presently there are no obstructions located in the approach surfaces of Runway 15/33.

4.5 Airside Facility Requirements

4.5.1 Runway 15/33

In consideration of the forecast of future aviation activity, the existing runway was analyzed from several perspectives. These include airfield capacity, runway orientation, runway length, pavement strength, and compliance with applicable FAA design standards. The analysis for these various aspects pertaining to the runway system design provide the basis for recommendations pertaining to airside improvements.

4.5.1.1 Runway Length

The critical aircraft selection is the primary consideration for the length requirements for Runway 15/33. **Table 4-2** provides the results from the FAA Airport Design software program that was used for this analysis. Variables required by the program include the airport elevation, mean maximum temperature of the hottest month, the difference in feet between the high and low points of the runway, stage length for aircraft weighing more than 60,000 pounds, and the condition of the runway in terms of either dry or wet and slippery. Input variables for Central Colorado Regional Airport are:

Airport Elevation:	7945 Feet
Maximum Centerline Elevation Difference:	46.4 Feet
Mean Maximum Temperature:	79.6 Degrees F
Stage Length for Aircraft Weighing Greater Than 60,000 Pounds:	500 Miles*

* *The default minimum value is 500 miles.*

The software's output provides information for different classifications and percentages of aircraft that the runway will be designed to accommodate. The first distinction is between small and large aircraft. Small aircraft are defined as those weighing less than 12,500 pounds. Aircraft in the small category are almost exclusively piston driven propeller aircraft, although there are some small turboprop aircraft in this category as well. Large aircraft are those weighing in excess of 12,500 pounds, which comprise the remainder of the fleet. The critical aircraft for Central Colorado Regional Airport, the Cessna CJ2, is within the small aircraft classification.

An analysis of Table 4-2 indicates that the optimum runway length for Central Colorado Regional Airport is between 6,700 and 9,400 feet. This study recommends maintaining the existing length of 8,300 feet. Should larger aircraft begin to use the airport on a regular basis, the runway will have to be widened to 100 feet and the RSA graded to a width of 300 feet and to a length of 600 feet beyond each runway end to meet the ARC identified in the previous Airport Master Plan Update.

It is recognized that 8,300 feet is not the optimum runway length for the airport based on the results shown in Table 4-2. Close proximity to the Town of Buena Vista and wetlands located to the north of the airport limit expansion and compromise compatible land uses around the airport. Roads, both to the north and the south of the airport, also limit expansion due to the costs to acquire more land and relocate appropriate ground access routes. With a length of 8,300 feet, the runway will continue to be able to accommodate 75 percent of small aircraft with fewer than 10 seats and 75 percent of large aircraft of 60,000 pounds or less at a 60 percent useful load during the hottest summer months. During the remainder of the year when temperatures are moderate or cool and density altitude is lower, this runway length should be able to accommodate 95 to 100 percent of the utility fleet and additional turbojet and/or large turbine propeller aircraft on a year round basis.

Table 4-2

AIRPORT AND RUNWAY DATA	
Airport elevation	7946 feet
Mean daily maximum temperature of the hottest month	79.60 F.
Maximum difference in runway centerline elevation	46 feet
Length of haul for airplanes of more than 60,000 pounds	500 miles
Dry runways	
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with approach speeds of less than 30 knots	470 feet
Small airplanes with approach speeds of less than 50 knots	1440 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	6740 feet
95 percent of these small airplanes	9410 feet
100 percent of these small airplanes	9410 feet
Small airplanes with 10 or more passenger seats	9410 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	8160 feet
75 percent of these large airplanes at 90 percent useful load	9060 feet
100 percent of these large airplanes at 60 percent useful load	11460 feet
100 percent of these large airplanes at 90 percent useful load	11460 feet
Airplanes of more than 60,000 pounds	Approximately 7800 feet
REFERENCE: Chapter 2 of AC 150/5325-4A, Runway Length Requirements for Airport Design, no Changes included.	

4.5.1.2 Runway Orientation, Additional Runways

To determine the proper orientation of a runway, a review of the available wind data for the airport is made. FAA guidance suggests that additional runway be planned if the wind coverage is less than 95 percent for the classification of aircraft being accommodated. Wind data is typically gathered at stations maintained by the National Climatic Data Center and acquired from them in a

format that is compatible with FAA guidance for the graphic representation in a wind rose. The required data includes hourly readings for wind speed and direction correlated to sky condition.

This information, however, has not been collected by the NCDC at a site close enough the airport to be representative of the wind conditions on the airport. However, volunteers at the airport collect wind data four times daily and this data was reviewed, along with anecdotal evidence of typical wind patterns at the airport. Being situated in a valley with the continental divide directly to the west and high terrain to the east, there are fairly predictable patterns that occur on a daily basis. The runway is situated parallel to the valley orientation, which is the alignment that lent itself to the most economical cost for construction and the least terrain obstructions. However, the diurnal patterns associated with the heating and subsequent cooling of the slopes by the sun cause a "sloshing" effect of the air in the valley and often the wind is blowing directly across the runway. A second runway oriented in an alignment that would offer a pilot a final approach heading better situated to the wind during these events would reduce the potential for either an accident or a diversion to another airport.

Using the available wind data, which was compiled and analyzed by Mal Sillars Weather Consultants, Inc., a series of monthly averages by wind speed and direction for the period 1998-2001 were produced. **Tables 4-3** and **4-4** present the results of the analysis. **Table 4-3** summarizes monthly wind direction and speed in the second and third columns. The fourth and fifth columns relate the direction and speed to the true north alignment of the existing runway, in this case 342 degrees. Utilizing vector analysis, the columns show the component speeds for headwind (directly down the runway centerline) and crosswind (perpendicular to the runway centerline). This crosswind component is the key indicator of whether the runway is properly aligned for the prevailing winds. The lower the crosswinds, the better oriented the runway is.

Table 4-3

Average headwind and crosswind velocities for Runway 33							
	Resultant	Average	Average Speed		Average	Average High Wind	
Month	Direction	Speed	Headwind	Crosswind	High Wind	Headwind	Crosswind
January	298	9.0	6.5	-6.3	21.3	15.3	-14.8
February	278	9.4	4.1	-8.4	23.5	10.3	-21.1
March	271	8.3	2.7	-7.8	20.2	6.6	-19.1
April	260	9.5	1.3	-9.4	22.7	3.2	-22.5
May	276	9.1	3.7	-8.3	22.4	9.1	-20.5
June	250	9.0	-0.3	-9.0	22.4	-0.8	-22.4
July	257	7.3	0.6	-7.3	18.5	1.6	-18.4
August	324	8.5	8.1	-2.6	20.2	19.2	-6.2
September	293	8.6	5.6	-6.5	21.4	14.0	-16.2
October	262	8.3	1.4	-8.2	19.9	3.5	-19.6
November	317	8.5	7.7	-3.6	19.8	17.9	-8.4
December	305	9.1	7.3	-5.5	21.0	16.8	-12.6
ANNUAL	**280**	**8.7**	**4.1**	**-7.7**	**21.1**	**9.9**	**-18.6**
	-Crosswind from West			-Headwind from South			

Referring to the Average Speed for the headwind and crosswind columns in **Table 4-3**, the average crosswind speed on an annual basis is 7.7 knots blowing from the west. The strongest crosswinds occur in April, where the average wind blows almost perpendicular to the runway at 9.4 knots. The three columns on the right side of **Table 4-3** show the speeds for high winds. This refers to the maximum wind speed, sometimes referred to as "gusts", observed while the data was being collected. As shown, the high winds are a significant jump up in speed from the steady winds. Observed crosswinds peak in April at 22.5 knots and average 18.6 knots annually. Aircraft most common to Central Colorado Regional Airport that encounter crosswind components of greater than 13 knots will consider landing at a different airport. Most pilots that attempt to land in crosswinds of 18 to 22 knots will be exceeding the limits of the aircraft's controllability in the conditions and this has been the cause of numerous accidents over the years, a summary of which are shown in **Table 4-5.**

Table 4-4 is identical to the layout of **Table 4-3**, except the runway direction used in the analysis is oriented on a true bearing of 302 degrees. Therefore, the only difference is in the Average Speed and Average High Wind columns. Looking at the Annual crosswinds, it is clear that this orientation places much more of the wind on the headwind component and far less on the crosswind component. In fact the 40-degree rotation of the runway resulted in reducing the average crosswinds by half. In the High Wind condition, the occurrence of average crosswinds exceeding 13 knots only occurs in two months compared to the nine months exceeded in **Table 4-3**. So the likelihood of a pilot facing a crosswind that exceeds the aircraft's crosswind limitation is greatly reduced with the addition of another runway. This is strong evidence that another runway at Central Colorado Regional Airport should be depicted on the Airport Layout Plan and further wind data collected an analyzed to justify the priority of this runway to the FAA.

Table 4-4

Average headwind and crosswind velocities for Runway 29							
	Resultant	Average	Average Speed		Average	Average High Wind	
Month	Direction	Speed	Headwind	Crosswind	High Wind	Headwind	Crosswind
January	298	9.0	9.0	-0.6	21.3	21.2	-1.5
February	278	9.4	8.6	-3.8	23.5	21.5	-9.6
March	271	8.3	7.1	-4.3	20.2	17.3	-10.4
April	260	9.5	7.1	-6.4	22.7	16.9	-15.2
May	276	9.1	8.2	-4.0	22.4	20.1	-9.8
June	250	9.0	5.5	-7.1	22.4	13.8	-17.7
July	257	7.3	5.2	-5.2	18.5	13.1	-13.1
August	324	8.5	7.9	3.2	20.2	18.7	7.6
September	293	8.6	8.5	-1.3	21.4	21.1	-3.3
October	262	8.3	6.4	-5.3	19.9	15.2	-12.8
November	317	8.5	8.2	2.2	19.8	19.1	5.1
December	305	9.1	9.1	0.5	21.0	21.0	1.1
ANNUAL	**280**	**8.7**	**8.1**	**-3.3**	**21.1**	**19.6**	**-7.9**
	-Crosswind from West			-Headwind from South			

Table 4-5

Date	Probable Cause Released	Location	Make / Model	Regist. Number	Severity	Type of Air Carrier Operation and Carrier Name (Doing Business As)	Circumstances
3/11/03		Buena Vista, CO	Piper PA-12	N78559	Nonfatal	Part 91: General Aviation	Crosswind, variable 210 to 270 15G21
3/28/02	4/29/03	Buena Vista, CO	Cessna 210-M	N29795	Nonfatal	Part 91: General Aviation	Adverse weather, downdraft
5/26/00	9/19/01	BUENA VISTA, CO	Cessna T210K	N9457M	Fatal(3)	Part 91: General Aviation	Enroute accident, departed Jeffco - crashed on Cottonwood Pass
7/18/99	5/12/00	BUENA VISTA, CO	Rader LONG EZ	N6577C	Nonfatal	Part 91: General Aviation	Student pilot's first solo, failure to maintain control
1/28/98	5/4/98	BUENA VISTA, CO	AVIAT A-1	N503MZ	Nonfatal	Part 91: General Aviation	Crosswind changed to tailwind, 230/10kts
1/20/96	5/9/96	BUENA VISTA, CO	CESSNA 180	N6502A	Nonfatal	Part 91: General Aviation	Crosswind, 260 at 20G25
3/18/94	11/14/94	BUENA VISTA, CO	CESSNA 172L	N7876G	Nonfatal	Part 91: General Aviation	Improper supervision by instructor pilot
5/30/93	11/3/93	BUENA VISTA, CO	SCHEMPP-HIRTH NIMBUS II	N173	Nonfatal	Part 91: General Aviation	(Glider) Pilot's improper use of flaps
5/23/93	11/3/93	BUENA VISTA,CO	CESSNA 172N	N4881G	Nonfatal	Part 91: General Aviation	Crosswind to Quartering tailwind (wind shear), improper use of flaps
10/28/90	11/9/92	BUENA VISTA, CO	CESSNA T-210-M	N621BD	Nonfatal	Part 91: General Aviation	Fuel exhaustion
10/23/90	10/2/92	BUENA VISTA, CO	CESSNA 172H	N2665L	Nonfatal	Part 91: General Aviation	Student pilot's improper flare
9/15/89	12/10/90	BUENA VISTA, CO	LET L-13	N3458	Fatal(1)	Part 91: General Aviation	(Glider) Pilot's failure to maintain sufficient airspeed during low maneuver
1/20/89	1/22/91	BUENA VISTA, CO	CONVAIR 580	N73160	Nonfatal	SCHD Part 121: Air Carrier	Pilot cut fuel to wrong engine while feathering an overheating engine
9/5/87	8/2/88	BUENA VISTA, CO	LET L-13	N38924	Nonfatal	Part 91: General Aviation	Unsuitable landing area selected by pilot
5/31/86		BUENA VISTA, CO	PIPER PA-20-160	N5394Z	Fatal(1)	Part 91: General Aviation	Strong crosswind, thunderstorm in area
7/25/85		BUENA VISTA, CO	Beech 58P	N6039S	Nonfatal	Part 91: General Aviation	Engine failure on takeoff resulting in stall
8/4/82	8/4/83	BUENA VISTA, CO	BELL HELICOPTER TEXTRON	N23DW	Nonfatal	Part 91: General Aviation	(Helicopter) Crashed at 14,000 feet (off airport)
12/24/81		BUENA VISTA, CO	PIPER PA-32	N32916	Fatal(1)	Part 91 General Aviation	Crashed at 11,900 feet (off airport)

Another reason to have a second runway is to reduce the concentration of noise and overflights that occur over the Town of Buena Vista just to the north of Runway 15. In fact, during a public meeting, it was suggested that another runway be constructed as the *main* runway, thereby alleviating the restrictions to land uses within the Airport Protection Overlay district.

While this study finds merit in the case for a crosswind runway, there are several challenges to be overcome in the actual planning and construction of a new runway:

- Funding – A significant cost is associated with the acquisition of land, relocation of roads, grading of the airfield, lighting, environmental remediation, paving and lighting of a new runway. The project would need to be eligible for FAA funding, as the Town of Buena Vista would not likely have the resources to undertake the project alone.

- FAA/CDOT support for the Project – To determine eligibility, it would need to be demonstrated that Runway 15/33 does not provide 95 percent wind coverage at 13 knots. This data is not yet available, but with the recent installation of a wind instrument maintained by CDOT, this data should be available within the next 12 months. FAA and CDOT also consider crosswind runway projects to be a lower priority than primary runway projects on a statewide basis.

- Land Use Compatibility - There are other considerations for land use compatibility and overflight with a crosswind runway, including potential impacts to the correctional facility and Johnson Village.

Considering these issues, the likelihood of having funding support for a full-length paved crosswind runway is low. However, the Town of Buena Vista should not feel discouraged about this since there are other ways to initiate the project. There is every possibility that the FAA could participate in the development at a later stage if the project is started through a local effort. To protect the possibility of the FAA supporting the project, a number of steps should be taken:

- Prepare an Environmental Assessment or justify a Categorical Exclusion.

- Complete the wind collection and a runway siting study.

- File a Form 7480 with the Denver Airports District Office – this will give the FAA the opportunity to review the airspace changes associated with the new runway.

- Follow the procedures in 49 CFR Part 24 (the Uniform Relocation Assistance and Real Property Acquisition Act) for all land acquisition – if this is not done, the FAA will not be able to participate in development on any acquired land.

- Maintain a safe and secure airport during construction phases.

- Allow the FAA to comment on construction plans and specifications – having the FAA involved, even if they are not participating will increase their comfort level in the project and make it easier for them to justify participation at a later time.

- Maintain all Design Criteria and Separation for the selected ARC.

The recommended strategy is to get a prepared landing area established, even if it is a short gravel strip. If this can be done with local effort and money, it may be possible to get a grant at some point in the future to make improvements to it such as paving, lengthening, lighting, etc. In the mean time, there will be a landing area available for those conditions when crosswinds are strong enough to warrant the use of the gravel strip. **Figure 4-1** shows the runway alignment that **Table 4-4** analysis is based upon.

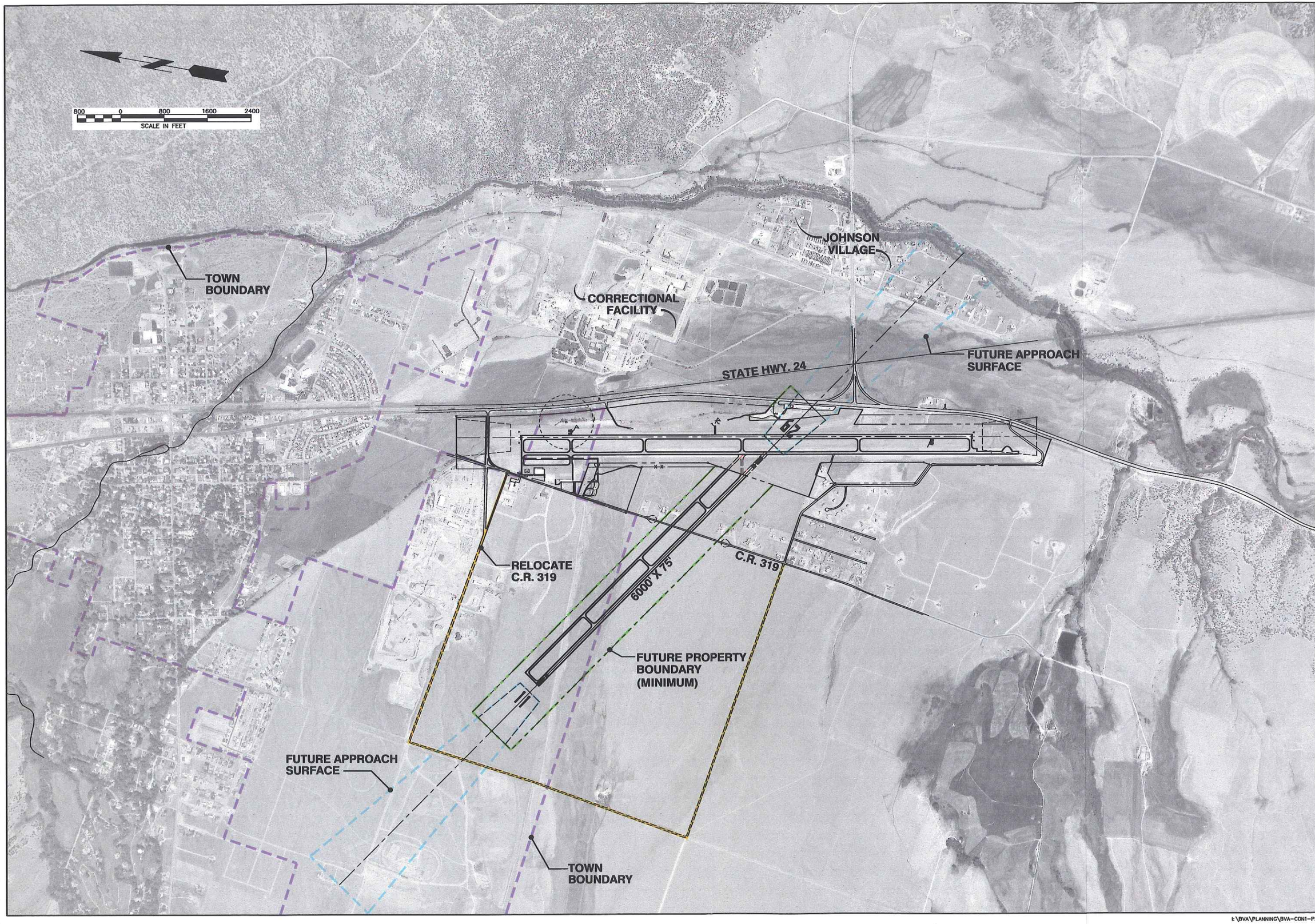
4.5.1.3 Runway Longitudinal Profile

Runway 15/33 was reconstructed in mid 1990s and meets the gradient criteria for Approach Category A & B aircraft. This criterion only requires that the gradient not exceed 2.0 percent over the entire length of the runway. At a grade ranging of 0.57 percent, Runway 15/33 is in compliance with this criteria.

4.5.1.4 Runway Pavement Strength

According to airport records, Runway 15/33 is rated as having an existing runway pavement strength of 12,500 pounds for Single Wheel Gear. The critical aircraft which dictates the Airport Reference Code is the Cessna CJ2, which weighs 10,100 pounds and has Single Wheel Gear. Additionally, although there are not enough operations to warrant naming any larger or heavier aircraft as the critical aircraft, heavier planes such as the Gulfstream V, the Canadair Global Express, and the Boeing Business Jet do operate at the airport.

In light of the operation of these aircraft on the runway and taxiway system, it is recommended that the pavement be maintained at its current strength until such time as a new critical aircraft is identified as a result of new or increased activity by larger aircraft.



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CADD FILE NO.

STAGE OF PLANS

REV.	DATE	DESCRIPTION	APP.

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CENTRAL COLORADO
REGIONAL AIRPORT
BUENA VISTA, COLORADO

CROSSWIND RUNWAY

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FIGURE 4-1

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4.5.1.5 Runway Safety Area and Runway Object Free Area

As discussed in a prior section, the Runway Safety Area (RSA) and the Runway Object Free Area (ROFA) are defined areas surrounding the paved portion of the runway that enhance the safety of aircraft operations. The dimensions of these areas are tied to the Airport Reference Code (ARC) of the airport. The existing RSA and ROFA currently meet the requirements for ARC B-II. Please see Table 4-1 for a discussion on design criteria.

4.5.2 Parallel Taxiway

There is one taxiway that parallels Runway 15/33. Taxiway "A" is a full parallel taxiway measuring 50 feet wide by with six connector taxiways, each 35 feet wide. The 35-foot width is consistent with the criteria for Airplane Design Group II, which is the most demanding group that could be justified in light of existing traffic at the airport.

The taxiway, which was the former runway, is in need of rehabilitation and a project to repair cracks and overlay the surface will be included in the Capital Improvement Program. This project is recommended for completion within the first five years.

4.5.3 Instrumentation and Lighting

An instrument approach is currently available for Runway 33. Navigational signals are provided through the Global Positioning System, which provides airborne equipment position information that is suitable for executing a non-precision approach. The availability of this approach makes the installation of the Non Directional Beacon (NDB) that was recommended in the previous Airport Master Plan Update unnecessary. No other electronic navigational facilities are recommended by this study.

There are Medium Intensity Runway Lights and Taxiway Lights (MIRL and MITL) for Runway 15/33 and Taxiway "A" respectively. No additional lighting is necessary during the planning period.

4.5.4 Automated Weather Observation System

To provide accurate, 24-hour airport weather information for pilots and air traffic control system personnel, this study recommends the installation of an AWOS at Central Colorado Regional Airport. This system will provide efficient and low-cost surface observation data critical to airport operations including continuous, updated, minute-by-minute broadcasts of touchdown-zone weather conditions. The observation will be broadcast by voice directly to pilots in the air on a

discrete VHF frequency. During flight planning, pilots can alternatively call a local telephone number to receive the most current weather information. This information includes temperature, wind speed/direction, visibility, cloud height, and dewpoint.

This system will also aid in the collection of wind data that will be crucial in assembling data that will potentially identify the need for a crosswind runway.

4.6 Landside Facility Requirements

Landside facilities are those facilities that support the airside facilities, but are not actually a part of the aircraft operating areas. These consist of such facilities as terminal buildings, aprons, access roads, hangars, and support facilities.

4.6.1 Buildings

Buildings at Central Colorado Regional Airport are primarily private hangars and offices constructed by a Fixed Base Operator. Arkansas River Valley Aviation, the primary FBO on the airport, owns and operates one large hangar for storage and maintenance. They also have plans for several more hangars.

Hangars and buildings required to support the functions of an FBO are generally constructed with private funds and are not the responsibility of the county. Land is leased to the individual or business for their use. Recommendations for buildings of this type will be limited to reserving land for the purpose of leasing to FBOs or hangar developers. Land for this purpose is available on the South of Runway End 15.

The construction of a Snow Removal Equipment storage building would provide a protected environment for all airport equipment, as well as an area suitable for maintenance of airport vehicles. The appropriate size for this building is recommended in ***FAA Advisory Circular 150/5220-18, Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials.*** Based on calculations provided in this circular, a 6,000 to 8,000 square-foot building is recommended to house existing equipment, provide area for storage of materials, a maintenance area, an office, and storage of spare parts. This will also provide adequate room for growth as needed.

4.6.2 Apron Areas

With nearly 13,500 square yards of apron area and 20 tiedown spaces for based aircraft, there are adequate apron areas on the airport to accommodate existing demand for based and transient tiedown needs. There will be requirements for apron and taxilanes in support of new hangar

development. The ability to develop new hangars is one of the key market advantages that Central Colorado Regional Airport enjoys over many of the competing airports in the region. Land has been identified for this purpose on the south end of the terminal area.

Future construction of T-hangars has been planned for the area southwest of Taxiway A-5. The proposed development is located outside of the BRL approximately 575 feet from the runway centerline.

4.6.3 Access and Auto Parking

There is excellent access to the airport from the east on U.S Highway 24/285. Access to the airport from the Town of Buena Vista from the north, is provided via County Road 319 and exist off of U.S. Highway 24.

There is ample auto parking for the airport's administrative and terminal functions. Periodic maintenance projects will be required, the timing of which will be dictated by monitoring pavement condition. Parking to support new buildings for visitors and employees will be made a part of development approvals as provided in development guidelines. The airport will not be required to provide parking to support private airport development.

4.7 Utility Systems

All utility lines serving the airport are buried underground and provide service to the Administration/FBO building and executive hangar. A four-inch sanitary sewer line provides wastewater discharge into the airport's wastewater treatment facilities, which consist of a 1,500-gallon septic tank and associated leach field. The septic tank and leach filed are located directly east of the building area, between the paved apron and Taxiway "A". The Sangre de Cristo Electric Association provides electricity. Water lines serving the airport from the Buena Vista Municipal Water Plan provide potable water and fire protection. Two fire hydrants are located on the east edge of the apron edge taxiway opposite the northeast corner of the Administration/FBO building and just west of the building along the edge of the auto parking lot. Natural gas provides heating fuel for the airport and is supplied by Comfurt Gas, Inc. The airport has a public telephone with service provided by Qwest Communications.

4.8 Rules and Regulations, Standards for Commercial Activities at the Airport

The sponsors of airports developed or improved with federal funding assistance administered by the FAA assume the obligation to make the airport's facilities and services available to any and all users of the airport, as well as the general public. Where federal funds have been expended on an airport the opportunity to engage in any activity which involves, makes possible, or is required for the operation of aircraft, or which contributes to or is required for the safety of such an operation should be made available to any person, firm or corporation meeting rules and regulations established by the sponsor. The rules and regulations must be relevant to the proposed activity, reasonable, and in the public interest.

An airport sponsor may restrict the commercial use of the airport, or the solicitation of business thereon, base again on nondiscriminatory standards established by the airport sponsor governing the quality and level of services that are offered to the public on connection with the conduct of a particular aeronautical activity on the airport.

The FAA defines aeronautical activity in Advisory Circular 150/5190-1A, Minimum Standards for Commercial Aeronautical Activities on Public Airports as follows:

> "…charter operations, pilot training, aircraft rental and sightseeing, aerial photography, crop spraying, aerial advertising and surveying, air carrier operations, aircraft sales and service, sale of aviation petroleum products whether or not conducted in conjunction with other included activities, repair and maintenance of aircraft, sale of aircraft parts and any other activities which because of their direct relationship to the operation of aircraft can be appropriately be regarded as an aeronautical activity."

This study recommends that the Town of Buena Vista adopt rules and regulations for airport users and minimum standards for commercial tenants and airport businesses.

4.9 Land Use

A zoning ordinance was amended in January 1991 by the Town of Buena Vista that established an Airport Protection Overlay (APO) district. This district was created to protect the Town's investment in the airport and to limit the development of new land uses that are incompatible with the airport. This was done for the welfare of the citizens as well as the protection of the airport. The district minimizes exposure of sensitive land uses to aircraft noise areas, to minimize the

danger from potential aircraft accidents, to reduce the possibility of such accidents, to discourage traffic congestion within the district, and to restrict non-compatible land uses within the APO.

After living with the ordinance for over ten years, it is apparent that some of the language is ambiguous and, under strict interpretation, can be construed as overly burdensome to property owners within the APO. Under this strict interpretation, it departs from the intent of the APO district. In addition, since the APO is situated in relation to the runway, it does not provide an easily definable boundary and can divide individual properties. This becomes problematic to define what property is in the APO and what property is outside. In order to attempt to clarify the intent of the APO district, and also to clarify the boundary of the areas of special concern, two modifications are recommended by this study, which are summarized below.

1. The definition of a Flight Hazard Area. This area, established in the APO ordinance but not defined, is created with a boundary that is defined by physical features, in this case roads. This Flight Hazard Area has three main features:
   a. Height limitation is the same as the underlying zone
   b. New development must be below that specified in FAR Part 77, otherwise an FAA Aeronautical Study must determine that the proposed project is not a hazard to the navigable airspace.
   c. No new noise-sensitive uses including, but not limited to schools, churches, hospitals, and libraries.

2. The addition of language that clarifies the disposition of non-conforming uses. Currently, if a non-conforming use is destroyed, the replacement would be deemed a new use and would be subject to the restrictions under the APO. Also, additions to non-conforming uses are currently not permitted without an FAA determination on its effect on the navigable airspace. This study recommends the addition of language that allows for the reconstruction of grandfathered non-conforming uses that are damaged or destroyed and also to allow additions to these uses, subject to requirements of the underlying zone, FAA determination on the proposal's effect on navigable airspace, and not exceeding a ratio of seating capacity to floor space as existed prior to expansion. This would be limited to the expansion of public assembly areas in structures used for public assembly purposes.

Proposed language for inclusion and/or amendment to the APO district will be provided to the Town of Buena Vista and included as an appendix in the Final Airport Master Plan Narrative Report.

4.10 SUMMARY

The airport has many excellent characteristics that are desirable for an airport. There is ample space for buildings and apron areas, excellent access, recently reconstructed runway pavement, and public utilities. However, facility requirements center on the need to change classification to meet the needs of those who are wanting to bring corporate jets to the airport. This demand is already demonstrated and forecasted to grow.