



Airport Master Plan Update

CHAPTER ONE INVENTORY

1.0 Introduction

The inventory is the initial step in the development of the Master Plan Update. Pertinent data and information was assembled which relate to aviation activity in the region and airport development requirements. The inventory is a systematic and comprehensive data collection process which provides an understanding of past and present aviation factors. The information compiled is then used as a basis to forecast aviation demand and determine future airport facility requirements.

1.1 Airport Setting and Role

Rapid City Regional Airport is located on 1,635 acres at an elevation of 3,202' above sea level. The airport is approximately twelve miles east of downtown Rapid City and primary access to the airport is from State Highway 44. The Vicinity Map, Figure 1-1 shows the airport's proximity to Rapid City and other surrounding communities.

Rapid City Regional Airport is a primary commercial service airport that has averaged over 180,000 passenger enplanements from 1992-1996. Based on the types of aircraft now operating at the airport, Rapid City Regional Airport is classified as an ARC C-III airport. This primary designation is based on the FAA Airport Reference Code (ARC) which relate aircraft approach speed in knots and wing span of aircraft. Aircraft with higher approach

speeds need longer runway lengths to land and to take off safely. Aircraft wingspan relates primarily to runway and taxiway separation criteria.

Over the years, and currently, there has been a considerable amount of commercial service activity and general aviation activity at the airport. Commercial aircraft currently operating at Rapid City Regional Airport include the McDonnell Douglas DC-9, the Canadair Regional Jet, the DeHavilland Dash 8 and the Embraer 120 Brasilia. Typical general aviation aircraft operating at Rapid City vary from smaller aircraft such as the Cessna 172 to larger turboprop and business jet aircraft such as the Beech King Air, and the Cessna Citation II. Currently, there are 100 aircraft based at the airport.

1.2 Airport Management

Rapid City Regional Airport is owned and operated by the City of Rapid City. The Executive Director is responsible for handling emergency situations, promoting the airport to the air carriers, and for communicating with local civic groups, the news media, and concerned citizens regarding airport operations. The Airport Operations Officer is responsible for the daily operation of the airport and ensuring that the needs of all users of the airport (air carriers, general aviation, and military) are being met.

The Airport Maintenance Director is responsible for managing the daily assignments of maintenance staff at the airport. Currently, there are 17 full time employees at the airport.

1.3 Airport Board

The Airport Board consists of five members appointed for five year terms by the mayor. The Board has the power to regulate and manage the Rapid City Regional Airport with the approval of the city council. Airport staff meets monthly with the Board to discuss issues and procedures relevant to the airport.

1.4 Airfield Facilities

Airport facilities are divided into two groups: airfield and terminal. The airfield facilities at Rapid City Regional Airport include runways, taxiways, airport lighting, navigational aids (NAVAIDs), among others. The terminal building, aircraft parking apron, hangars, and auto parking areas are considered terminal or landside facilities. Descriptions of these facilities are given in the following sections. Figure 1-2 graphically shows the existing airport facilities and Table 1-1 describes the major airfield facilities and equipment, with an estimate of the physical conditions.

1.4.1 Runway Facilities

Rapid City Regional Airport has two operating runways as shown in Figure 1-2. The two intersecting runway configuration was designed to accommodate propeller-type aircraft which are more susceptible to varying degrees of crosswinds. Runway 14-32 is the

primary runway and is 8,701 feet long and 150 feet wide. The runway has a weight bearing strength rating of 190,000 pounds dual wheel gear (dwg). The runway was reconstructed of concrete in 1996 and is in excellent condition. Runway 14-32 is a precision instrument runway; therefore, it has precision runway markings, is equipped with High Intensity Lights, and is grooved.

The crosswind Runway 5-23 is 3,600 feet long and 75 feet wide. The runway has a weight bearing strength rating of 12,500 pounds single wheel gear (swg). The runway, based on visual inspection, is considered to be in fair condition, and has basic/visual runway markings. Runway 5-23 has a line-of-sight problem due to the fact that unobstructed sight does not exist along the runway centerline for at least one-half of the runway length. Additionally, the runway pavement has several dips and "rideability" problems.

1.4.2 Taxiways

The taxiway system at Rapid City Regional Airport is a series of parallel and connecting taxiways. Taxiway Alpha is parallel to the primary Runway 14-32. Currently, there are seven connecting taxiways that link Alpha to the runway. All taxiways are 75 feet wide and have the same weight bearing strength as Runway 14-32 (190,000 pounds [dwg]). The connecting taxiways are designated A-1 beginning at the Runway 14 end and continuing to A-6 at the Runway 32 end. The current condition of the taxiway pavement, based upon visual inspection, is good.

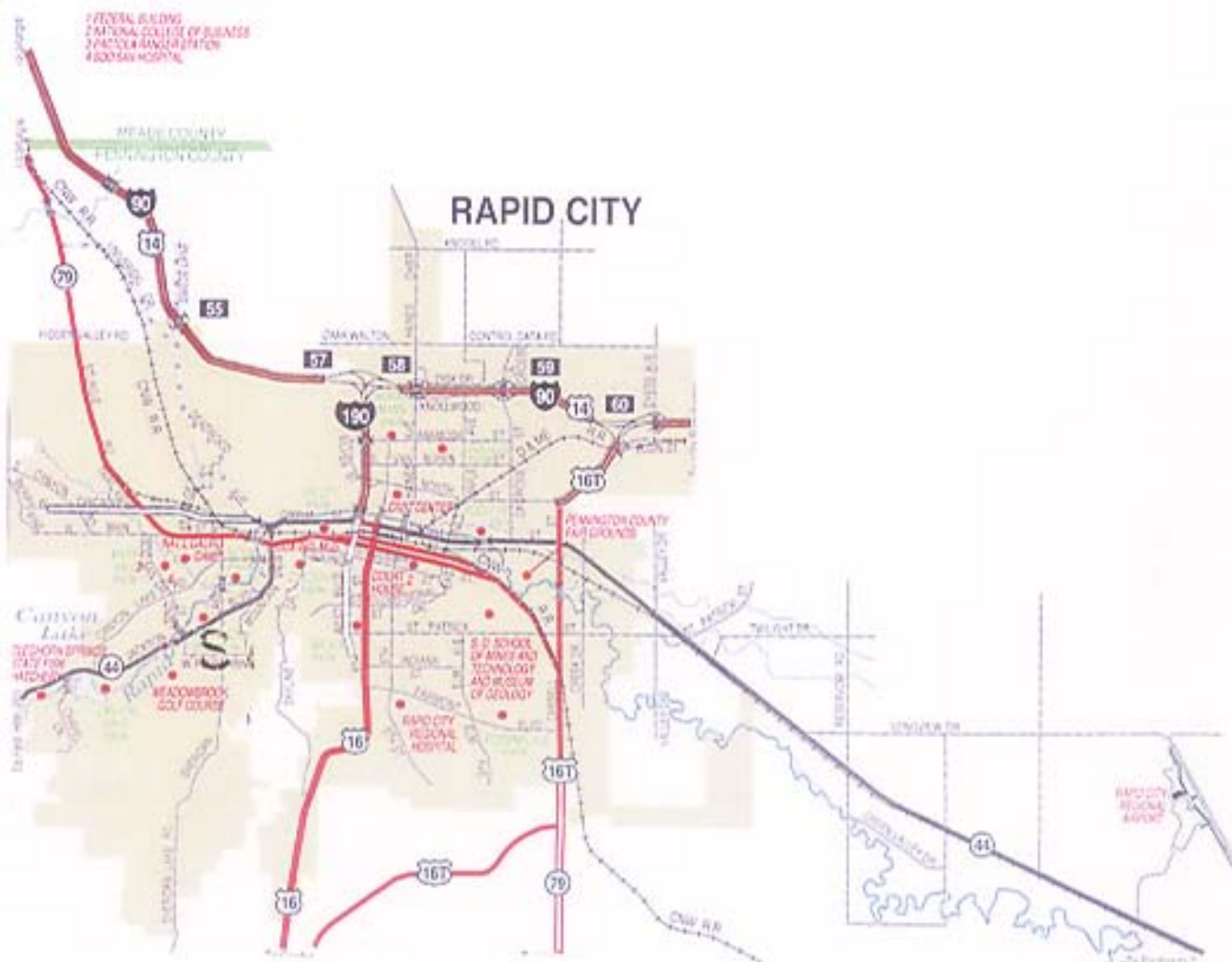
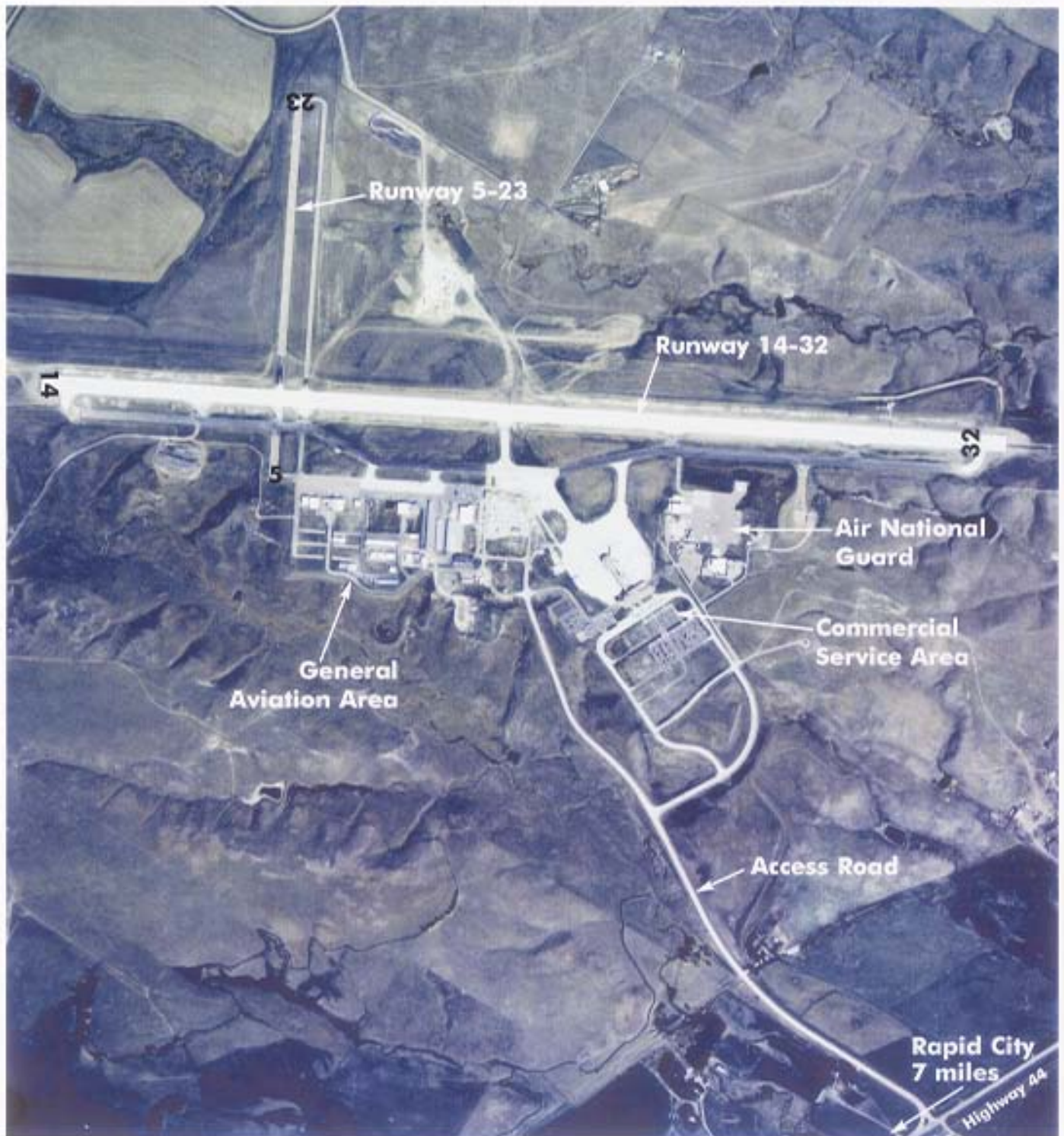


Figure 1.1



Aerial photography provided by Horizons

Figure 1.2

Based on the current operational fleet mix at Rapid City, the northern and southern portions of the parallel taxiway do not meet the runway / taxiway separations required for ARC C-III aircraft.

Taxiway Bravo is parallel to Runway 5-23 and is 40 feet wide. It is equipped with Medium Intensity Lights (MITL) and has the same bearing strength as Runway 5-23 (12,500 pounds [swg]). It is currently in fair condition, based on visual inspections.

TABLE I-1 EXISTING AIRFIELD FACILITIES Rapid City Regional Airport		
Airfield Item	Airfield Description and Size	Condition†
Runways		
Runway 14-32 Pavement Strength Edge Lighting Pavement Markings Visual Descent Indicators Lighting Approach Aids True Bearing	8,701' x 150' - Concrete - grooved 190,000 lbs. (dwg) High Intensity Runway Lighting (HIRL) Precision PAPI-4 - Runway 14 & 32 REIL - Runway 14 / MALSR Runway 32 N151.92° E	Good
Runway 5-23 Pavement Strength Edge Lighting Pavement Markings Visual Descent Indicators Lighting Approach Aids True Bearing	3,600' x 75' - Asphalt 12,500 lbs. (swg) Medium Intensity Runway Edge Lighting (MIRL) Visual - Basic PAPI-4 - Runway 5 & 23 Threshold N61.84° E	Fair
Taxiways and Turnarounds		
Taxiway A - Runway 14-32 Pavement Strength Edge Lighting	75' wide - Asphalt 190,000 lbs. (dwg) 300,000 (dtwg) Medium Intensity Taxiway Lights (MITL)	Fair
Taxiway B - Runway 5-23 Pavement Strength Edge Lighting	40' wide - Asphalt 12,500 lbs. (swg) Medium Intensity Taxiway Lights (MITL)	Fair
Airfield Items		
Wind Indicator Rotating Beacon Weather Station	Airfield Near former terminal building Automated Surface Observation System (ASOS)	Fair Good Good
Note: Conditions based Bucher, Willis & Ratliff Corporation visual inspection of facilities and equipment. Note: True runway bearing from FAA Flight Standards Database (FAA Oklahoma City - 5/9/96).		

DWG - Dual wheel gear
 DTWG - Dual Tandem Wheel Gear
 Source: Bucher, Willis & Ratliff Corporation, November, 1996

1.4.3 Runway and Taxiway Lighting

A variety of lighting aides are now available at the airport to help in the identification, approach, landing and taxiing operations at night or in poor weather conditions. At Rapid City, when the control tower is closed the lighting system can be keyed up by the pilot. The following paragraphs describe the airfield lighting aids at Rapid City Regional Airport.

Approach Lighting System (ALS) are used near the runway to complement the electronic NAVAIDS. The ALS provides a lighted path to the runway threshold to allow the pilot to visually transition the aircraft and perceive alignment, roll, height and position relative to the threshold. A Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) is the system in use on Runway 32. MALSR's are approved for Category I precision approaches.

Runway 14-32 and Runway 5-23 are equipped with *Precision Approach Path Indicator-4* systems (PAPI-4). PAPI's provide visual decent information to the pilot. PAPI's help the pilot determine whether the approach is high, on line or low while descending toward the runway threshold.

Threshold lights are located at the immediate ends of each lighted paved runway at airports and are critical for the safe landing of aircraft. The lights consist of two-color red/green lens. The green half of the lens faces approaching aircraft and indicates the beginning of the usable runway. The red half of the lens faces the aircraft during takeoff, again indicating the

end of the usable runway. All runways at Rapid City Regional Airport are equipped with threshold lights.

After crossing the threshold, the aircraft must complete a touchdown and roll out on the runway. Runway edge lights are used for this landing phase. Edge lights give pilots information on alignment, roll, and distance. Runway 14-32 is equipped with *High Intensity Runway Lights (HIRL)*. Runway 5-23 is equipped with *Medium Intensity Runway Lights (MIRL)*. Taxiway edge lighting is also provided to enable pilots to taxi aircraft safely to and from the terminal area to the runway. At Rapid City Regional Airport, blue edge lights are provided on taxiways Alpha and Bravo.

The *rotating beacon*, identifies the location and presence of the airport. The beacon is equipped with an optical system that projects two beams of light, one green and one white, 180 degrees apart. The beacon at Rapid City Regional Airport is located near the parking lot of the former terminal building.

1.4.4 Electronic Navigational Aids (NAVAIDS)

Airport navigational aids are equipment installed on or near the airport to provide pilots with electronic guidance and visual references to execute instrument landings. A variety of electronic navigational aids to assist pilots landing aircraft are available at Rapid City Regional Airport. The type of navigational aids can affect the approach

minimums used for landing. The term minimum refers to the lowest altitude a pilot can descend without having visual contact with the runway. The more sophisticated the NAVAID, the lower the minimum approach altitude (provided the aircraft is properly equipped and the pilot is appropriately trained).

A *Precision Instrument Landing System (ILS)* provides the lowest minimum altitudes for landings requiring instrument guidance. It consists of three major parts: 1) localizer, and glide slope, 2) marker beacons, and 3) approach lights. Currently, a precision ILS approach is in operation for Runway 32 at Rapid City Regional Airport.

The *localizer* provides horizontal guidance for landing an aircraft. The ground to aircraft radio signal tell the pilot the aircraft's position relative to the runway centerline. A *glide slope* provides elevation guidance to an aircraft on final approach. The transmitted radio signal indicates whether the aircraft is to high, low or on the precise angle of the approach descent.

Marker beacons consist of the outer, middle, and inner marker beacon. The inner marker is optional. The ILS approach to Rapid City Regional Airport does not have an inner marker. As aircraft pass over the marker beacons, the pilot is given an audio cue over the radio that signals the aircraft distance to the runway.

The *approach lights (MALSR)*, the last component in the ILS, was previously discussed in Section 1.4.3.

Where an ILS provides for both horizontal and vertical electronic guidance, a *non-precision instrument approach* system provides for horizontal guidance only. A straight-in non-precision approach is also available to Runway 14 and 32 from the Rapid City VORTAC. A straight-in non-precision approach to Runway 32 from the RANCH non-directional beacon (NDB) is also available.

The Rapid City VORTAC (VHF Omni-Directional Range/Tactical Air Navigation) is located 4 miles away from the airport along the extended centerline from Runway 32. It is used for en route navigation and non-precision instrument approaches to the airport. For approaches, the VORTAC provides course and distance information to the pilot. It is also used for instrument flight rules (IFR) and visual flight rules (VFR) practice instrument approaches.

A *Non-Directional Beacon (NDB)* is a low frequency radio beacon that allows the pilot of an aircraft equipped with directional finding equipment to find and determine aircraft position relative to the radio beacon. Pilots generally fly to the NDB until visual contact is made with the airport, then enter the air traffic pattern and proceed with an approach.

New advances in navigation/satellite technology will change present navigational systems. *Global Positioning System* (G.P.S.) is a satellite navigational system that encodes transmissions from ground-based data link stations and satellite transmitters with an on-board portable receiver. The system works through lines of position (L.O.P.) and is presently used for en route navigation and non-precision instrument approaches. Precision instrument approaches have not yet been approved but are expected in the near future. However, G.P.S. will most likely be the primary means of all navigation systems in the future, with present electronic aids used as a backup system. It is predicted that eventually G.P.S. will provide worldwide navigation coverage because of its position accuracy, and because its signals are not affected by weather conditions. A non-precision GPS overlay approach is available for Runway 14-32 at Rapid City Regional Airport.

1.5 Area Airspace

The airspace structure in the Rapid City Region is either *uncontrolled* or *controlled*. Uncontrolled airspace is defined as all airspace that has not been designated as controlled, and which Air Traffic Control (ATC) has neither the authority nor responsibility for control. Controlled airspace, on the other hand, is supported by ground/air communications, navigational aids, and air traffic services.

Virtually all airspace above 14,500 feet mean sea level is considered controlled. Airspace under that altitude can be either controlled or uncontrolled, depending upon the air traffic density, proximity to an airport, and geographic factors.

Another category of controlled airspace is designated *Special Use*. Special use airspace consists of that airspace where limitations are imposed upon aircraft operations usually because of military activity. Special use airspace is classified as Restricted Areas, Military Operation Areas, and Prohibited Areas. Military operating areas (MOA) are also associated with military training, but does allow through flight when in use. The nearest MOA to Rapid City is the Tilford MOA which is 20 miles north of the airport. Extreme caution is advised when traversing an active MOA. The area airspace terminology is described in the following sections and is shown in Figure 1-3.

1.5.1 En route Airspace System

Flights within the United States are normally directed along navigational routes that are as well-defined as the surface road system. These airspace structures are a key element in aircraft traffic flows. Three route systems are now in use:

- * VOR Airway System;
- * Jet Route System; and
- * Area Navigation System (RNAV).

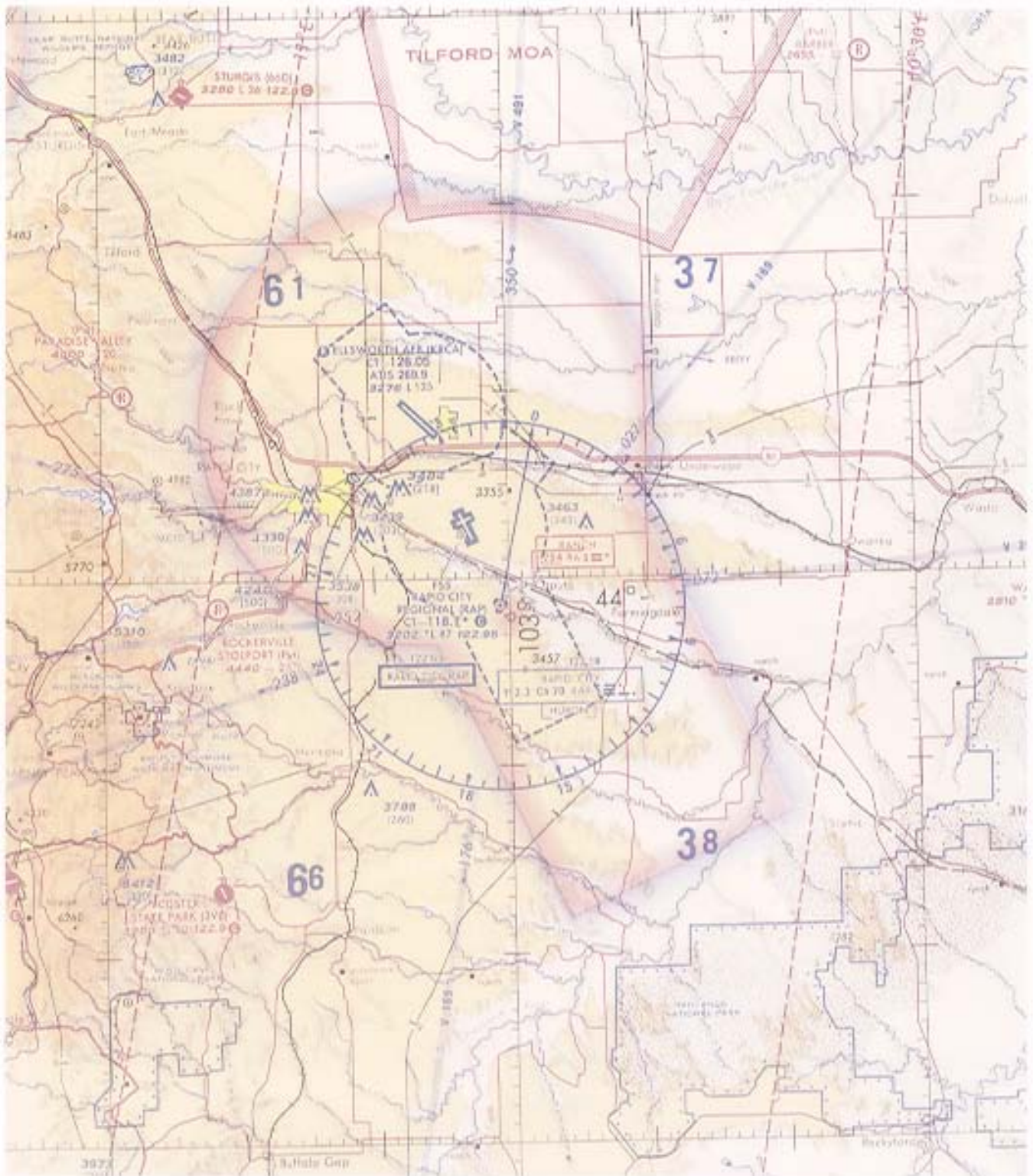


Figure 1.3

1.5.2 VOR Airway System

VOR (very high frequency omni-directional range) Airways, also known as Victor Airways, are a low altitude system consisting of airways from 1,200 feet above the surface up to, but not including, 18,000 feet above mean sea level (MSL). The VOR system uses an Alpha-numeric code, with V followed by a number, for example, V21. These airways use only VOR/VORTAC navigational aids. Victor Airways are a minimum of eight nautical miles wide.

1.5.3 The Jet Route System

Airways from 18,000 feet (msl) to 45,000 feet, or flight level (FL) 450, designated for aircraft that customarily operate at these altitudes, compose the jet route system. These routes also operate using VOR ground navigation stations, but the system requires significantly fewer stations, since line-of-sight operation gives the VORs substantially greater range when serving aircraft at high altitudes. The width of the airways of the jet route system is similar to that of the Victor Airways. Navigation through the jet route system requires the use of En route High Altitude Charts.

1.5.4 Area Navigation System (RNAV)

RNAV is a method of navigation that permits aircraft operations on any desired course within the coverage of station-referenced navigation signals or within the limits of a self-contained system capability. RNAV routes are direct routes, based on area navigation

capability, between way points defined in terms of latitude/longitude coordinates, degree/distance fixes, or offsets from published or established routes/airways at specified distances and directions. NAVAID equipment includes VORTAC, OMEGA, VCF, INS, MLS, RNAV, and LORAN-C.

1.6 Air Traffic Control

The purpose of this section is to describe the management of airspace in the vicinity of Rapid City Regional Airport. Much of this discussion is based on information obtained in FAA documents and discussions with FAA and control tower personnel.

There are two major jurisdictional categories of airspace – Air Route Traffic Control Center Airspace (ARTCC) and Air Traffic Control Tower (ATC) Airspace. These categories define a specific volume of airspace.

1.6.1 Air Route Traffic Control Centers

All aircraft flying under Instrument Flight Rules (IFR) and not under control of military or terminal facilities are monitored by air route traffic control center (ARTCC). These centers control an aircraft's route of flight between airports and provide separation of services, traffic advisories, and weather advisories. The United States is divided into approximately 20 different ARTCCs. En route Rapid City area aircraft falls within the Denver ARTCC area of responsibility. Aircraft flying under visual flight rules (VFR) may also be monitored by these centers if they

have filed a flight plan with a Flight Service Station (FSS) prior to takeoff. The nearest FSS to Rapid City is located in Huron, South Dakota.

1.6.2 Airport Traffic Control Tower Airspace

An Airport Traffic Area, or air traffic control tower airspace, is the airspace under jurisdiction of an air traffic control tower (ATCT). For Rapid City, this area is defined as a Control Zone. This is a circular area with a radius of five statute miles with extensions to include instrument approach and departure paths.

1.6.3 Published Instrument Approaches

The electronic navigational aids, described in conjunction with the approach lighting systems, allows Rapid City Regional Airport to offer four current published instrument approaches as follows:

- * ILS Approach Runway 32
- * VOR/TACAN/GPS
Approach Runway 14
- * VOR/TACAN/GPS
Approach Runway 32
- * NDB Runway 32

1.7 Airport Imaginary Surfaces

Related to the physical layout of the airfield are the runway approach requirements and imaginary surfaces required by the FAA.

Descriptions of these standards as they apply to the Rapid City Regional Airport are explained in Part 77 of the Federal Aviation Regulations (FAR Part 77). These represent the key components of the airspace at the airport and have an influence on the location of airport and off-airport buildings and above ground facilities.

1.7.1 Approach and Runway Protection Zones (RPZ)

A *Runway Protection Zone* is a trapezoidal area off the runway end to enhance the protection of people and property on the ground. The exact dimensions of this zone are defined by the type of aircraft and type of operations to be conducted on the runway. Ideally, these areas are controlled by the airport sponsor or owner in order to assure that the safety of approaching aircraft is protected and to ensure the safety of those on the ground. The RPZ begins 200 feet beyond the runway threshold at the end of the area usable for takeoff and landings, and is centered along the extended runway centerline. Table 1-2 identifies the dimensions of the individual RPZs associated with the current runways at Rapid City Regional Airport.



**TABLE 1-2
RUNWAY PROTECTION ZONES (RPZ) ***
Rapid City Regional Airport

Runway	Aircraft Served	Approved Approach	Zone Length	Inner Width	Outer Width
32	All	Precision	2,500'	1,000'	1,750'
14	All	Non-Precision	1,700'	500'	1,010'
05	Small	Visual	1,000'	250'	450'
23	Small	Visual	1,000'	250'	450'

* Source: Bucher, Willis & Ratliff Corporation Field Inventory, November, 1996;
Per A/C 150/5300-13, Change 4

The approach surface is defined as a surface longitudinally centered on the extended runway centerline and extending outward and upward from the end of the runway pavement. An approach surface is also deter-

mined and controlled based on the type of approach available (precision, non-precision, visual) or planned for that runway. Table 1-3 indicates the dimensions of the various approaches at Rapid City.

**TABLE 1-3
RUNWAY APPROACH SURFACES ***
Rapid City Regional Airport

Runway	Aircraft Served	Approach	Slope	Length	Inner Width	Outer Width
32	All	Precision	50:1 40:1	10,000'* 40,000'*	1,000' 1,000'	16,000'
14	All	Non- Precision	34:1	10,000'	1,000'	3,500'
05	Small	Visual	20:1	5,000'	250'	1,250'
23	Small	Visual	20:1	5,000'	250'	1,250'

* Source: Per A/C 150/5300-13, Change 4: The 50:1 approach slope extends through the initial 10,000' of the approach surface, at which point it changes to a 40:1 slope for the final 40,000'.

1.7.2 FAR Part 77 Imaginary Surfaces

Ideally, airports should be located so that the surrounding airspace is free and clear of obstructions that could be hazardous to aircraft on takeoff or approach paths or when operating in the airport vicinity. It is therefore necessary to maintain the surrounding airspace free from obstacles by preventing the installation, development, or growth of obstructions to airspace that could cause the airport to become unusable. The regulations for the protection of airspace in the vicinity of airports are established by the definition of imaginary surfaces, the penetration of which represents an obstruction to air navigation. Again, the geometry of the imaginary surfaces is governed by regulations set forth in Federal Aviation Regulations (FAR) Part 77. The protected airspace around Rapid City Regional Airport is made up of five principal imaginary surfaces, which are explained as follows and illustrated in Figure 1-4. At Rapid City Regional Airport there are no FAR Part 77 airspace obstructions.

* **Primary Surface:** Is a surface that is longitudinally centered on the runway, extending 200 feet beyond the threshold in each direction and measuring 1,000 feet wide for Runway 14-32 and 250 feet wide for Runway 5-23.

* **Approach Surface:** As defined in Table 1-3.

* **Horizontal Surface:** Is a horizontal plane 150 feet above the established airport elevation. The plane dimensions of the horizontal

surface are set forth by arcs of specified dimensions from the end of the primary surfaces, connected by tangents.

* **Transition Surface:** Is an inclined plane with a slope of 7:1 extending upward and outward from the primary and approach surfaces, terminating at the point where they intersect with the horizontal surface or any other surface where more critical restrictions apply.

1.8 Terminal Facilities and Services

Terminal facilities are defined as that portion of the airport other than the aircraft operating areas. Facilities include the terminal building, aircraft parking apron, hangar areas, auto parking, and the airport access road. Fixed base operations (FBOs) are also a part of landside facilities and include: general aviation passenger waiting areas, pilot lounges, aircraft maintenance, fuel storage, and aircraft rental, storage, and sales.

1.8.1 Terminal Area

The Rapid City Regional Airport has a large terminal area located along the west side of Runway 14-32. There are three areas within the terminal area and from north to south are the FBO/general aviation area, the commercial service airlines area, and the Air National Guard area.

The general aviation area provides facilities for transient general aviation aircraft and based general aviation aircraft. Occasionally, the GA ramp is used by commercial service aircraft

when Denver (DIA) cannot accommodate all flights due to poor weather. The commercial service area includes four basic components: the terminal building, the terminal apron, ground transportation systems, and related support facilities. The South Dakota Air National Guard is used by helicopters and a few fixed wing aircraft performing training operations. There are hangars, offices, and classrooms in the area. Figure 1-5 shows the commercial service area and facilities.

1.8.2 Terminal Building

The existing terminal building was constructed

and completed in 1988, and is approximately 90,000 square feet. The lower level consists of airline and rental car counters, the baggage claim area, restrooms, and a waiting area. The upper level includes the passenger gates, a passenger screening area, waiting areas, the restaurant and lounge, a gift shop, an airport management offices. The building was constructed and currently meets the Americans with Disabilities Act requirements and has an elevator connecting the two levels. Table 1-4 provides a summary of the existing terminal building components.

TABLE 1-4 COMMERCIAL TERMINAL BUILDING AREAS Rapid City Regional Airport	
Area	Approximate Square Feet (SF)
BASEMENT	1,750 S.F.
GROUND FLOOR/LEVEL 1	
Airline Areas (Ticket Area)	12,000 S.F.
Rental Car Agencies	1,400 S.F.
Public Space/Circulation	16,000 S.F.
Public Restrooms	1,000 S.F.
Baggage Claim	11,400 S.F.
Bag Make-Up Canopy	3,950 S.F.
Limo Center	40 S.F.
Total Area Level 1	45,790 S.F.
SECOND FLOOR/LEVEL 2	
Security /Screening /Holding Area	19,635 S.F.
Public Space/Circulation	9,597 S.F.
Restaurant/Lounge	5,468 S.F.
Gift Shop	928 S.F.
Office	1,000 S.F.
Meeting Room	600 S.F.
Public Restrooms/Nursery	1,200 S.F.
Total Area Level 2	38,428 S.F.
UPPER FLOOR MECHANICAL	4,032 S.F.
Total:	90,000 S.F.

Source: Bucher, Willis & Ratliff Corporation Field Inventory, November, 1996

1.8.3 Aircraft Parking Apron

The commercial service aircraft parking apron at Rapid City Regional Airport is approximately 30,000 square yards in size. The apron area is currently used by all three of the commercial carriers: Northwest, Delta/SkyWest, United/Mesa, and an occasional charter. The apron is concrete and, based on visual inspection, is in good condition.

The general aviation apron has recently been rebuilt and is in good condition. The apron is approximately 15,000 square yards in size and there are approximately 30 spaces available for based and itinerant aircraft. Tiedowns are available in grassed areas which are leased to the FBO's.

1.8.4 Aviation Fuel Storage

Table 1-5 lists the present fuel facilities and capacities at the Airport. The airport offers 100LL and Jet A fuel. Fuel is distributed to aircraft by trucks. The aboveground fuel storage tanks are located east of the general aviation area.

1.8.5 Airport and Ground Terminal Access

The majority of passengers and visitors to the airport enter from Highway 44 to Airport Road. Upon entering Airport Road, passengers proceed up a hill toward the terminal building. Airport Road completes a loop around the auto parking facilities and passes along the terminal drop-off area.

The enplaning and deplaning passenger roadway, curb, and walkway are at ground level and are located along the front of the terminal building. The curb is approximately 350 feet long. The drop-off area is along the front of the terminal building's two entrances. Tour bus loading is available and is located at the west end of the terminal curb area. The short-term rental car parking is accessed from Airport Road just west of the terminal building.

Access to the FBO/general aviation area is from Highway 44 and Airport Road, but branches off from commercial service area access via the old airport entrance road. The FBO/general aviation service road provides access to fixed base operator areas, employee parking areas, and T-hangar areas and conventional hangar locations.

TABLE 1-5 AIRPORT FUEL FACILITIES Rapid City Regional Airport			
Fuel Dispensing Unit	Capacity (Gallons)	Type	Size
Jet A	30,000	Above ground	2 (1 - 10,000; 1 - 20,000)
AVGAS - 100LL	30,000	Above ground	2 (1 - 10,000; 1 - 20,000)
Automotive Fuel	10,000	Above ground	1 (10,000)
Diesel - Field Equipment	10,000	Above ground	1 (10,000)

Source: Bucher, Willis & Ratliff Corporation; Airport Site Inspection - November, 1996.



Aerial photography provided by Horizons

Figure 1.5

1.8.6 Automobile Parking

Currently, there are 140 short-term automobile parking spaces located directly in front of the terminal building. Passenger long-term parking is located in the same vicinity but farther away from the terminal.

Long-term parking is provided through a 24-hour access gate, and there are 400 spaces in the long-term parking lot. There are four handicapped spaces available. The rental car agencies have one parking lot, located west of the airport terminal and across Airport Road from the passenger parking areas. The lot is used to hold cars that are ready for immediate rental with space available for those in storage.

In addition to the commercial service parking space, there is a considerable amount of private automobile parking area at the airport.

These areas are used by customers of the FBO's, students of the flight training school, businesses at the airport, and the Air National Guard. The amount of the private parking is difficult to estimate because the parking areas are loosely defined and distributed along buildings. The former terminal building has approximately 300 spaces for parking.

1.8.7 Aircraft Rescue and Firefighting (ARFF)

Aircraft Rescue and Firefighting (ARFF) services are currently located along the Runway 14-32 flight line and in the former terminal building. The airport is classified as an ARFF Index A airport serving regularly scheduled Index A air carrier aircraft as well as unscheduled air carrier aircraft. ARFF equipment appropriate to Index A is provided on 24-hour basis. ARFF Index B is available upon request 24 hours prior to operations. ARFF data is shown below in Table 1-6.

Type Vehicle	Brand/Year	Condition	Response Time
T1500 - Gal.	OshKosh - 1988	Good	3 Min.
1500 - Gal.	Walters - 1976	Good	3 Min.

Source: Bucher, Willis & Ratliff Field Inventory, November, 1996

1.8.8 Fixed Base Operators (FBO)

There are currently two Fixed Base Operators (FBOs) providing services for general aviation, commercial, and military aircraft. These include West Jet Air Center and Air Services, Inc. West Jet provides fuel sales (Jet A - AVGAS), aircraft maintenance, aircraft storage, and passenger/pilot facilities. Air Services, Inc. provides fuel

sales, aircraft maintenance, air charter, aircraft rental, and passenger pilot facilities.

1.8.9 Airport Hangar Facilities

Table 1-7 identifies the ownership, type, and size of each hangar building at the Rapid City Regional Airport. Figure 1-6 shows the general aviation area, associated hangar code and location.

Code	Tenant	Hangar Type	Approximate Area (SF)
# 1	Air Advantage	Conventional	6,000'
# 2	Air Services, Inc.	Conventional	8,000'
# 3	Air Services, Inc.	Conventional	6,400'
# 4	Air Services, Inc.	Conventional	7,000'
# 5	Lund	Conventional	4,200
# 6	Horizons	Conventional	5,600'
# 7	WestJet Air Center	Conventional	10,000'
# 8	WestJet Air Center	T-Hangar (14 Units)	13,500'
# 9	Multiple Owners	T-Hangar (10 Units)	10,000'
# 10	WestJet Air Center	T-Hangar (10 Units)	10,000'
# 11	WestJet Air Center	Conventional	18,000'
# 12	WestJet Air Center	Conventional	4,200'
# 13	Slingsby	Conventional	4,000'
# 14	LTD Corp.	Conventional	3,300'
# 15	FLM Corp.	Conventional	3,300
# 16	Hillard	Conventional	2,400'
# 17	Schaaf	Conventional	1,600'
# 18	Sween Products	Conventional	1,600'
# 19	Multiple Owners	T-Hangar (8 Units)	8,000'
# 20	Multiple Owners	T-Hangar (6 Units)	8,000
#21	Nelson	Conventional	1,600'

Source: Bucher, Willis & Ratliff Corporation; Airfield Site Inspection, Airport Information - November, 1996



Aerial photography provided by Horizons

Figure 1.6



1.8.10 Air Cargo Services

The following air freight operators currently have use agreements or leases at the airport and operate at Rapid City Regional Airport on a daily basis:

- * Northwest Airlines
- * Delta/SkyWest
- * United Parcel Service
- * United Express
- * Federal Express

1.8.11 Air Traffic Control Tower

The air traffic control tower is a non-radar Category I - visual tower only; therefore, no

radar guidance is currently available to pilots during IFR meteorological conditions. The tower is located west of Runway 32, and the hours of operation are from 6:00 am to 10:00 pm daily. Local radar guidance is provided from Ellsworth Air Force Base.

1.8.12 Airport Utilities

Rapid City Regional Airport has utility services including electric power, water, telephone, and sewage treatment. The types of airport utilities and their providers are listed on Table 1-8.

TABLE 1-8 AIRPORT UTILITIES Rapid City Regional Airport	
Utility/Service	Utility/Service Provider
Electricity	West River Electric
Fire Protection (on airfield)	Rapid City
Natural Gas	Montana/Dakota Utilities
Sanitary Sewer System	On-site treatment facility
Telephone	US West
Water	Rapid City

Source: Bucher, Willis & Ratliff Corporation Field Inventory, November, 1996

1.9 Existing Airport Land Use

Rapid City Regional Airport is currently situated on a site containing a total of approximately 1,635 acres. The property can be

divided into six functional areas based upon current airport use patterns. These areas include:

- * Airport Operations Area
- * General Aviation Areas
- * Terminal Area
- * Support Services
- * Commercial/Industrial
- * Agricultural and/or Undeveloped
- * Aircraft Operations (commercial and general aviation)
- * Based Aircraft (general aviation)
- * Aircraft Mix (types)
- * Military Activity

Figure 1-7 shows the general locations of the current operational areas on the Rapid City Regional Airport.

1.10 Historic Airport Activity Levels

The Federal Aviation Administration currently defines three broad categories of aviation activity: general aviation, certificated air carrier, and military. At present, Rapid City Regional Airport has exposure to all three categories of use.

This section of the inventory presents an overview and summary of historical and current aviation activity at Rapid City Regional Airport. Data concerning past levels of passenger enplanements, total aircraft operations, total general aviation based aircraft, military usage, and historical enplaned cargo serves as the basis for forecasting future demand, assessing existing capacity, and identifying additional facility requirements. Data was collected from Airport Management Records, Air Traffic Control Tower records, and FAA records for the following activities:

- * Commercial Air Carrier Passenger Enplanements
- * Air Cargo Activity

1.10.1 Historic Commercial Air Carrier Passenger Enplanements

Commercial air carrier activity includes all regularly scheduled airline activity performed by airlines certified in accordance with Federal Aviation Regulations (FAR) Parts 121 or 127.

Part 121 includes major air carriers as well as commuter air carriers that operate aircraft with a configuration of 60 seats or more, and provide at least five scheduled round trips per week between two or more points, or that carries mail.

At Rapid City Regional Airport, some commercial aircraft are counted as air taxi because the aircraft in use do not meet the 60-passenger seat configuration. The commuter-type airlines at Rapid City Regional Airport, however, are certificated under FAR Part 121.

Passenger enplanements are defined as the number of revenue passengers boarding an aircraft, including stopover and transfer passengers. Rapid City has non-stop flights to Denver, Salt Lake City, Minneapolis and Sioux Falls. Table 1-9 provides an overview of total passenger enplanements at Rapid City Regional Airport since 1980.

TABLE 1-9
HISTORIC PASSENGER ENPLANEMENTS 1980-1996
Rapid City Regional Airport

Year	Historic Enplanements
1980	143,750
1981	115,532
1982	107,888
1983	122,971
1984	122,767
1985	143,008
1986	172,339
1987	184,933
1988	160,484
1989	157,531
1990	150,938
1991	171,093
1992	171,098
1993	194,337
1994	192,484
1995	184,276
1996	180,794

Source: FAA and Rapid City Regional Airport Records.

1.10.2 Aircraft Operations

Aircraft operations refers to either the take-off or landing of an aircraft – commercial, general aviation, or military. Table 1-10 details the number of annual aircraft operations since 1989. It should be noted that air carrier operators that do not have 60 passenger seats

or more are counted as air taxi. Table 1-11 identifies the existing aircraft fleet mix at Rapid City based on FAA Airport Reference Codes.

TABLE 1-10 HISTORIC ANNUAL OPERATIONS 1989-1996 Rapid City Air Traffic Control Tower									
Year	Itinerant Operations					Local Operations			Grand Total Ops
	Air Carrier	Air Taxi	General Aviation	Military *	Total Itinerant	G. A. Ops.	Military *	Total Local	
1989	6,477	8,086	21,773	3,395*	39,731	20,862	6,893*	27,755	67,486
1990	5,259	11,679	21,237	2,964*	41,139	25,049	6,018*	31,067	72,206
1991	5,219	12,928	20,895	2,764	41,806	19,128	6,250	25,378	67,184
1992	5,211	12,007	21,601	2,931	41,750	22,311	6,204	28,515	70,265
1993	5,275	12,328	20,712	2,407	40,722	20,016	4,737	24,753	65,475
1994	3,355	14,773	22,389	2,453	42,970	18,299	3,762	22,061	65,031
1995	2,594	15,976	23,503	1,757	43,830	19,246	3,567	22,812	66,643
1996 †	2,047	11,371	20,997	2,571	36,986	17,180	1,762	18,942	55,928 †

Source: FAA/Rapid City Regional Airport Control Tower and FAA 5010 Forms.

* During 1989-1990, Military operations were not distinguished as local & itinerant. Recent years indicate that military operations have been 33% itinerant and 67% local.

† Primary Runway closed for two months for reconstruction.

TABLE 1-11
AIRCRAFT MIX BY CLASSIFICATION*
Rapid City Regional Airport

a. **Aircraft Approach Category.** An aircraft approach category is a grouping of aircraft based on approach speed. The aircraft approach categories percentage shown in this table represents the current mix of aircraft operations at Rapid City Regional Airport.

Small Aircraft:

1.	Category A: Speed less than 91 knots	66%
2.	Category B: Speed 91 knots or more, but less than 121 knots	32%

Larger Aircraft:

3.	Category C: Speed 121 knots or more, but less than 141 knots	1%
4.	Category D: Speed 141 knots or more, but less than 166 knots	1%
5.	Category E: Speed 166 knots or more	0%

b. **Airplane Design Group (Physical Characteristics).** The airplane design group subdivides airplanes by wingspan. The airplane design group concept links an airport's dimensional standards to aircraft approach categories or to airplane design groups or to runway instrument-ation configurations. The current percentages at Rapid City Regional Airport are shown below.

1.	Airplane Design Group I: Wingspan up to but not including 49 feet (15m)	66%
2.	Airplane Design Group II: Wingspan 49 feet (15m) up to but not including 79 feet (24m)	29%
3.	Airplane Design Group III: Wingspan 79 feet (24m) up to but not including 118 feet (36m)	5%
4.	Airplane Design Group IV: Wingspan 118 feet (36m) up to but not including 171 feet (52m)	0%
5.	Airplane Design Group V: Wingspan 171 feet (52m) up to but not including 197 feet (60m)	0%
6.	Airplane Design Group VI: Wingspan 197 feet (60m) up to but not including 262 feet (80m)	0%

* Per A/C 150/5300-13, Change 4

Source: Bucher, Willis & Ratliff Corporation Field Inventory, November, 1996.

1.10.3 Based Aircraft

A based aircraft is a general aviation aircraft that is permanently stationed or housed at an airport. The number of general aviation aircraft that can be expected to locate at an airport is an important factor in the planning

of future airfield and landside facilities, primarily for general aviation users. Table 1-12 shows the number and type of aircraft based at Rapid City since 1980.

**TABLE 1-12
BASED AIRCRAFT, 1980-1996
Rapid City Regional Airport/Pennington County**

Year	Single Engine	Multi Engine	Jet	Rotocraft	Military	Total Rapid City Regional Airport	Pennington County
1980	66	16	0	0	17	82	155
1981	66	16	0	0	17	82	157
1982	66	16	0	0	17	82	166
1983	84	17	1	0	19	102	175
1984	84	17	1	0	19	102	N/A
1985	84	17	1	0	19	102	175
1986	82	16	1	0	19	99	N/A
1987	82	16	1	0	19	99	132
1988	82	16	1	0	19	99	147
1989	82	16	1	0	19	99	142
1990	55	20	1	0	16	76 *	141
1991	55	20	1	0	16	76 *	156
1992	55	20	1	0	16	76 *	163
1993	45	20	2	0	12	67 *	170
1994	40	19	1	0	12	60 *	N/A
1995	40	19	1	0	12	60 *	N/A
1996	76	23	1	0	17	100	N/A

Source: FAA 5010 Inspection Forms and Rapid City Regional Airport Records.

+ Note: Military aircraft are not included in FAA totals.

N/A - Data not available

* - Recent counts of aircraft lead to conclusion that period 1990-1995 reported aircraft are low.

1.10.4 Air Cargo

Air cargo services at Rapid City Regional Airport are provided by the commercial carriers as well as Federal Express. Cargo is designated as either mail or freight. Mail is

items carried for the U.S. Postal Service, freight is passenger luggage or items used for next day delivery or pick up. Historic levels of air cargo at Rapid City since 1988 are indicated as follows in Table 1-13.

TABLE 1-13 HISTORIC CARGO IN POUNDS, 1988-1996 Rapid City Regional Airport				
Year	Mail On	Mail Off	Freight On	Freight Off
1988	367,164	219,093	248,292	672,382
1989	535,936	200,875	503,656	867,687
1990	922,256	228,368	670,586	966,728
1991	978,719	192,348	566,347	994,350
1992	1,318,613	176,608	788,551	1,046,738
1993	1,106,081	146,829	757,223	1,084,633
1994	790,035	166,388	852,977	954,812
1995	813,619	229,065	502,148	691,800
1996	977,716	163,314	471,067	643,987

Source: FAA and Rapid City Regional Airport Records

1.11 Area Airports

Other airports in the vicinity of Rapid City Regional Airport have an influence on the airport in terms of competing services, facilities, and airspace. The Rapid City Regional Airport

general aviation service area is defined primarily by the location of these other airport facilities. The general character and services associated with these airports are indicated in Table 1-14.

TABLE 1-14 AREA AIRPORTS				
Airport & Ownership	Associated City	Number of Runways	Longest Runway	Location Relative to Rapid City
Ellsworth AFB (DOD)	Rapid City	1	13,500'	8 miles North
Wall Municipal (Public)	Wall	1	3,500'	50 miles East
Custer State Park (Public)	Fairburn	1	4,000'	27 miles South
Custer County Airport (Public)	Custer	1	4,700'	46 miles Southwest
Black Hills -Clyde Ice Field (Public)	Spearfish	4	5,800'	45 miles Northwest
Sturgis Municipal (Public)	Sturgis	1	4,600'	28 miles Northeast

Source: Cheyenne Sectional Aeronautical Chart, Dept. of Commerce

1.12 Rapid City Regional Airport Study Area Characteristics

The historic and future levels of activity at an airport will depend, to a great extent, on the economic vitality, growth, and level of development in the airport's area of influence. For these reasons, defining the historical, present, and future characteristics of the airport's study area is an important step in master planning. Past and present conditions are readily determined; however, selecting a future growth scenario is much less precise. This section describes the study area and defines its historic and existing socioeconomic characteristics while reviewing the various growth trends and projections developed for the area. Identification of a future community growth scenario has been accomplished in the context of established community plans and policies, and from personal interviews with civic, governmental, tourism, and industry leaders.

An area's socioeconomic profile can have a direct relationship on its demand for aviation -

related activities. Experience has shown that the most significant factors typically in this profile are population, and income. Each of these are reviewed on the following pages.

1.12.1 Population

Table 1-15 illustrates the historical population for South Dakota and Pennington County, as well as population forecasts as provided by the University of South Dakota, Business Research Bureau. Pennington County's population grew significantly from 1970 to 1990, a change of 37 percent. During the same period, Rapid City's population increased by 24 percent. The area, therefore, during this 20-year period, was one of the fastest growing in the state. The population projections for Pennington County indicate continued growth with Pennington County's population projected to increase by almost 13 percent by the year 2015. About half of this growth would likely be by the City of Rapid City.

**TABLE 1-15
HISTORIC AND FORECAST POPULATION, 1970-2015**

Year	Rapid City	Pennington County	South Dakota
1970	43,836	59,349	666,257
1980	46,492	70,135	690,768
1990	54,523	81,343	699,999
1995*	56,000	84,357	713,649
2000*	57,000	86,827	726,293
2005*	58,400	89,350	736,947
2010*	58,800	90,303	745,641
2015*	60,000	91,606	754,105

* Source: Forecast Historic - U.S. Census Business Research Bureau - University of South Dakota, 1994. BWR Projections for City of Rapid City 1995-2015

1.12.2 Area Income

As indicated, an assessment of the economic conditions in the Rapid City Region is important for the later development of aviation demand forecasts. Historically, the increases in registered and based aircraft in the United States have been closely related to population and income levels, and trends in business and industrial growth.

From studies made by the Department of Commerce, it has been found that the likelihood

of taking a trip by air increases as family income increases. These findings have been confirmed by several Census of Transportation studies. The inclination and ability to own a general aviation aircraft or travel with commercial air carriers is a direct function of family income; i.e., the larger the family income, the higher the incidence of air travel. Table 1-16 identifies historic per capita income levels for the Rapid City/Pennington County region.

**TABLE 1-16
PER CAPITA INCOME, 1975-1993
Rapid City/Pennington County Area**

Year	Pennington County Per Capita Income	Deflator	Current Dollar Value ¹
1975	5,472	49.2	11,122
1976	5,874	52.3	11,231
1977	6,402	55.9	11,452
1978	7,292	60.3	12,093
1979	8,136	65.5	12,421
1980	9,075	71.7	12,656
1981	9,997	78.9	12,670
1982	10,597	83.8	12,645
1983	11,170	87.2	12,810
1984	12,017	91.0	13,205
1985	12,475	94.4	13,215
1986	13,109	96.9	13,528
1987	13,441	100.0	13,441
1988	13,696	103.9	13,181
1989	14,302	108.5	13,182
1990	15,272	113.3	13,479
1991	16,345	117.6	13,899
1992	17,392	120.9	14,383
1993	18,077	123.5	14,637

Source: U.S. Department of Commerce and Economic Report of the President, Feb., 1995.

¹ Dollar Value based upon 1987.

1.13 Travel Industry Overview

The travel industry in the United States is the country's third largest retail sales industry. According to the *U.S. Travel Data Center*, during 1995 domestic and international travelers spent \$421.5 billion, a 5.8 percent increase over the previous year and nearly 6.5 percent of the U.S. Gross Domestic Product. The use of goods and services of transportation carriers, travel agencies, commercial accommodations, restaurants, campgrounds, and attractions is predicted to grow at an 8 percent rate through the end of the decade. Tourism will be the leading retail business employer by the year 2000.

Currently, the travel and tourism industry directly employs over 6.6 million individuals. Travel industry employment constituted 5.7 percent of total U.S. nonagricultural employment during 1995. Food service employment grew almost 4 percent in 1995, continuing to provide the most jobs in the industry at 2 million. Lodging again ranked second with over 1.1 million employees, a 1.6 percent increase over 1994. Travel-generated employment in general retail grew substantially, 3.6 percent, to 312,000 jobs in 1995. Jobs directly generated by domestic traveler expenditures accounted for 85 percent of total travel-generated employment, while international travelers generated approximately 970,000 jobs.

The Data Center's *National Travel Survey* indicates the jobs were generated domestically by U.S. residents who took over 1.2 billion person trips (traveling 100 miles or more) in 1995, up 3 percent from 1994. Pleasure trips

accounted for 809.5 million of these trips, while business travel generated 207.8 million trips.

Pleasure travel, which accounts for 69 percent of all U.S. resident travel, has increased 50 percent since 1985. Over half of all pleasure trips are to visit friends or relatives (51%), while another third (31%) are for entertainment purposes. Overwhelmingly, pleasure travelers used motor vehicles for their travels (84%). Continuing a trend from previous years, the use of a friend or relative's home for accommodations continued to rank ahead of hotels and motels, with 43 percent of travelers choosing to forego paid lodging.

According to the U.S. Department of Commerce International Trade Administration, 43.4 million international travelers visited the U.S. in 1995, down 3 percent from the previous year. This marks the third year in a row that international arrivals has declined. However, *overseas* arrivals (excluding those from Mexico and Canada) grew an impressive 12 percent to 20.6 million. International tourists spent \$79.7 billion in the U.S. in 1995, creating a nearly \$20 billion trade surplus and making tourism America's largest service export.

Taking a closer look at one travel industry segment of interest to the Rapid City area, 18 percent of U.S. resident travelers said they participated in an outdoor activity in 1995, ranking "adventure travel" second behind shopping in travel activities. The Sporting Goods Manufacturers Association reports that between 1987 and 1993, there was a 110 percent increase in the number of people who hike/backpack 52 days per year or more to

799,000 people. The American Recreation Coalition notes that one in three Americans took an outdoor recreation vacation in 1995. The top activities were bicycling (20%), hiking (18%), camping (16%), wildlife viewing (15%), backpacking (12%), horseback riding (5%), mountain biking (5%) and rock climbing (4%).

1.13.1 South Dakota and Rapid City

Tourism in the state of South Dakota experienced moderate growth in 1995. Serving as the second largest revenue producing industry in the state, tourism has a dramatic economic impact. In 1995, travel expenditures were \$498.8 million with an economic impact of \$1.25 billion dollars. Over 28,000 jobs in the state can be attributed to 1995 travel expenditures.

The impact of tourism is evident throughout the state. Each of South Dakota's counties benefited from tourism in 1995. Not only did urban areas with extensively developed tourism infrastructure receive millions of dollars in tourism spending, but so did many rural areas which offer primarily natural attractions and rustic support facilities.

Outdoor recreational attractions are by far the most popular visitor destination in the state. Not surprisingly, the Mt. Rushmore National Memorial is the state's most visited site, followed by the Custer State Park. The following table outlines the top attractions in the state.

Attractions	1991	1992	1993	1994	1995
Mount Rushmore	2,681,928	2,586,785	2,604,692	2,755,394	2,626,591
Badlands	1,068,069	1,224,161	1,198,322	1,149,323	1,094,433
Custer State Park	1,425,945	1,494,400	1,495,355	1,651,115	1,700,217
Wind Cave	1,181,233	1,304,997	740,807	1,180,024	1,069,197
Lewis & Clark	888,114	901,614	844,251	1,043,451	1,102,499
Corn Palace*	478,473	546,771	561,149	587,822	535,861
Jewel Cave	152,725	155,066	132,611	148,552	154,758
Mammoth Site	87,962	90,924	88,527	98,837	103,096

*Corn Palace figures are from Memorial Day-Labor Day.

Minnesota residents provide the largest number of visitors to the state, followed by South Dakota in the domestic marketplace as

tracked through the state tourist information centers. Table 1-18 provides the place of visitor origin for South Dakota.

Origin	Percent
Minnesota	10.92%
South Dakota	8.59%
Illinois	7.08%
Wisconsin	4.73%
Nebraska	4.28%
North Dakota	3.83%
Missouri	3.77%
Michigan	3.47%
California	3.12%

Source: South Dakota Department of Tourism Research/Development Division

International visits to the state of South Dakota are an important source of tourism revenue. Canada is the largest inbound international market for the United States although as stated previously, the number of visitors has been declining for several years between 2-3% annually. South Dakota has experienced a higher percentage of decline in Canadian visitors than for the US as a whole. The number of Canadian visitors to South Dakota, according to the U.S. Department of Commerce, was 134,000 in 1993, 106,000 in 1994 (a 21% decrease) and 99,000 in 1995 (a 7% decrease). In tracking overseas markets, Germany by far produces the largest number

of international visitors, 45.3% of overseas international visitors. France ranked second with 14.8%, followed closely by the United Kingdom and Italy.

As part of the Rapid City Airport Master Plan, BWR commissioned an evaluation of international tour operators into the Region 5 tourism area. The study evaluated tour operators providing both group and FIT programs. Utilizing tour extract reports compiled by Rocky Mountain International, a regional tourism marketing consortium, a database search was done using the keywords "Rapid City", "Mt. Rushmore", "Custer",

"Crazy Horse", "Deadwood", "Badlands", "Black Hills", and "Keystone".

Of 177 German Tour operators included in the RMI database in 1995, 79 include Rapid City in either their group or FIT programs. These firms offer a total of 4,655 departure dates and a total of 16,963 overnights in Wyoming, South Dakota, Montana, and Idaho. Of the total, 3,550 overnight stays occur in South Dakota, with the majority occurring in the Rapid City/Deadwood area. Most of these programs are extended tours of the American west, ranging from 14-21 days. An evaluation of the tour extracts shows that none of the 79 tours which include Rapid City fly into or depart the Rapid City Regional Airport. Most utilize either Denver or Salt Lake City. The average overnight stay is 1 day and the total economic impact to the state is estimated at \$24.8 million.

West coast airports and Denver International serve as the preferred origin or departure point for most of the 24 French firms which include South Dakota in their tour programs. These operators offer a total of 766 departures and 3,517 overnights in the four state region. South Dakota captures 439 overnights with a total economic impact of \$3.0 million. Again, none of the tour extracts indicate utilization of the Rapid City Airport facilities for group programs.

There are six tour operators from the United Kingdom with scheduled air departures from Rapid City airport. This represents nearly 20% of the 31 UK operators offering programs into the Rocky Mountain region. These

operators provided 1,996 departures in 1995, generating 1,223 overnights in South Dakota versus 7,720 overnights total in the four states included in the survey.

It is impossible to evaluate the room night dollar impact of fly/drive programs since most in the international market are individually packaged using voucher for different rate classes of hotels and car rentals. The number of departures is likewise difficult to evaluate since most FIT programs are offered 365 days per year and not on specific dates as are group programs.

In all three markets, however, the projected room night impact of fly/drive programs is significantly higher than their group counterparts. In Germany, there are 117 firms offering fly/drive programs into Rapid City - generating an estimated 21,906 overnight stays. In France, 41 firms generated an estimated 8,028 overnight stays, while 81 United Kingdom operators offered programs generating approximately 7,705 overnights in the Rapid City region. A large number of these tours are presented as Rapid City/Badlands programs - indicating a significant portion may utilize the airport for either arrivals or departures. Since most FIT programs are tailored to small travel parties, they would not be as limited by aircraft size as would traditional group programs. Cost would remain a significant factor.

In the domestic tour market, Rapid City ranks ahead of Chicago in the number of multi-day tours visiting the area. According to a 1993 economic impact study conducted by SEA,

Inc. (the last year available), multi-day tours generated \$16,137,044 to Rapid City. A total of \$8,626,388 was spent on food, attractions, admissions and shopping, while \$7,510,656 was expended for lodging.

1.14 The Conventions and Meetings Market

Meetings and conventions contribute a significant portion of the existing travel business in the Rapid City area and are projected to be a significant factor in the success of potential new developments such as The Dunbar, and in any significant increase in passenger counts at the Rapid City Airport. An understanding of this market is key to the successful evaluation of the future growth in the number of visitors to the region.

Biennially, *Meetings & Conventions* magazine conducts a study to "take the pulse" of the meetings industry. The 1996 Meetings Market Report is based on a sampling of 1,092 corporate and association meeting planners nationwide, with questions focusing on 1995 activity. Among the key findings of the study:

- * The upward trend in attendance and spending at meetings noted in the last report (1993) continues.

Attendance at meetings in 1995 was up 21.5% over the two year period, while total delegate spending rose 8%.

- * The planners reported a total of 983,600 meetings in 1995, down 8% from the 1,019,600 meetings held in 1993. Meeting expenditures - the expenses of the sponsoring organization - fell 7.4% to \$37.4 billion, primarily as the result of corporate downsizing and cutbacks in discretionary spending.
- * Spouse/guest attendance at both association and corporate meetings saw healthy growth. Association meetings attracted 66% more guests, and corporate meetings 18%. Both groups are planning more children's activities as part of their programs.
- * Incentive programs skyrocketed 53%, from 60,200 in 1993 to 92,000 in 1995.

In 1993, association meetings other than conventions showed the healthiest growth, continuing a decade long trend. In 1995, that trend reversed itself as the number of such meetings declined 15%, to fewer than were held in 1985. Additionally, these association meetings experienced a decline in both delegate attendance and delegate spending.

	1993	1995	% CHANGE
Corporate Meetings	55.1	49.3	-10.5%
Conventions	10.7	13	+21%
Association Meetings	18.7	15.1	-19%
Total	74.5	67.4	-10%

Source: Meetings & Conventions (August, 1996)

The Market Probe survey reported attendance at corporate meetings in 1995 was 49.3 million, compared with 55.1 in 1993, a 10.5% decrease. Delegate attendance at association conventions rose significantly in 1995, with 13 million delegates attending association conventions, a 21% increase over 1993 figures.

1.14.1 Associations

Associations have proliferated rapidly, due in part to society's increasing specialization. Vertical associations such as "Women in Construction" and "The American Society for Surgery of the Hand" have evolved as a result of this trend. This growth is also due to technological breakthroughs which have led to the formation of groups devoted to a variety of new interests, such as nuclear medicine and space aeronautics. Consequently, there are now more than 23,000 national, 15,000 international, and 100,000 state, local and regional associations in the United States, representing every industry, profession, cause, and interest. Associations spend \$52.27 billion annually to hold

conventions, expositions and meetings.¹ Taken alone, the association meetings industry is the 22nd largest industry in the United States.

Although there are more associations and more specialization, declines in the number of meetings held were consistent in every association meeting category included in the 1995 study. The total number of meetings fell 15 percent from 206,500 in 1993 to 175,600 in 1995. Over the same period, total meeting attendance declined 19 percent from 18.7 million, and spending fell 16 percent from \$14.3 billion to \$12 billion.

In light of the decline in the number of meetings, 75 percent of the meeting planners said cost was an important factor in selecting a facility for an association meeting (not counting conventions), making it the most important single factor.

¹ *The Economic Impact of Conventions, Expositions, Meetings, and Incentive Travel*; American Society of Association Executives; October, 1995.

1.14.2 Corporate

Downsizing and cost-cutting measures took priority in the corporate meetings arena as well. As noted earlier, corporations planned fewer meetings, had fewer attendees, and spent less money. On average corporate meeting planners arrange 13 meetings per year. The meetings tend to be smaller than their association counterparts, averaging 62 people and lasting 2.8 days.

Corporate planners held a total of 797,100 meetings in 1995 hosting 49.3 million attendees. Their companies spent \$8.6 billion on these events - a whopping 19% decline from 1993. Not surprisingly, affordability topped the list of criteria planners cite in choosing a destination. In fact, cost tied availability of facilities for the top spot when both corporate and incentive planners were considered. Ease of transporting delegates to the destination and transportation costs ranked second and third respectively on the list of critical factors.

Money is also a critical factor in choosing a facility. Unlike 1993 when number, size, and quality of meeting rooms topped the list of factors, cost surpassed these criteria. It also was more important than quality of food service.

The Atlantic-South region was the most popular location for corporate meeting planners. In selecting their host city, planners normally narrow their choices to three cities and four hotels prior to making a final selection. In keeping with factors affected by

cost, brand loyalty has slipped in importance. Only 23% of planners use the same hotel chain for their meetings, compared with 31% in 1993.

1.14.3 Other Factors

The study revealed that total guest attendance at both corporate and association meetings experienced large increases (18 percent and 66 percent respectively.) Corporate meetings hosted 6.3 million guests in 1995, up from 5.3 million in 1993. Guest attendance at association conventions was also up: 4.3 million attended conventions in 1995, a 22 percent increase over 1993. The dramatic rise in guest attendance marks a significant change from 1994, when survey respondents reported large decreases in total guest attendance at both corporate and association meetings - 32 percent and 34 percent respectively. These increases and the evolving guest profile point to an increasing trend that annual meetings and corporate sales gatherings double as the annual vacation for couples and even entire families.

1.14.4 Expenditures

As noted earlier, *The Meetings & Conventions* survey indicated total meeting expenditures were \$37.4 in 1995, which includes transportation, hotel rooms, meeting space, food, entertainment, speakers, audiovisual equipment, and miscellaneous costs. This represents a 7 percent decrease from the 40.4 billion spent in 1993. For the past 12 years, meeting expenditures have risen and fallen alternately every two years, but the gains have far exceeded the biennial dips. After a post-recession boom in meeting expenditures in

1993 – up 15 percent over 1991 – the leveling off in 1995 reflects corporate downsizing and cutbacks. Corporate planners alone spent \$8.9 million on off-premises meetings in 1995 – a 19 percent decrease from 1993. Out of those expenditures in 1995, nearly \$8 billion, or 93 percent, was spent on meetings within the continental United States.

Overall convention delegate spending rose 11 percent from \$13.8 billion in 1993 to \$15.3 billion in 1995. While the average delegate spent 8 percent less in 1995, the rise in attendance is credited for the increased spending. Planners foresee larger budgets in the near future.

Of the survey respondents, 45 percent expected their budgets to stay the same, while 40 percent expected increases in their budgets from the 1995 levels. The average increase predicted was 18 percent. Of respondents who anticipated a budget decrease, 71 percent cited general organizational cutbacks and 46 percent pointed to cutbacks in the number of meetings as the primary reason.

The average spending per meeting per delegate in 1995 is \$672.47 and the average length of stay is 3.48 days per meeting. Spending patterns vary directly with the scope of the event. International, national, and regional events generate larger expenditures than local and state events.

TABLE 1-20 1995 ASSOCIATION MEETINGS Spending Generated Per Delegate Day			
CONVENTION EXPENDITURES	DAILY	TOTAL	% OF TOTAL
Delegate Expenditures (based on 3.48 days)	\$193.24	\$672.47	76
Association Expenditures (based on 4.98 days)	17.20	59.86	7
Exhibitor Expenditures per Delegate (based on 3.02 days)	44.42	154.61	17
TOTAL	254.86	886.94	100
BREAKDOWN OF EXPENDITURES/DELEGATE			
Hotel Room & Incidentals	89.07	309.96	46
Hotel Restaurants	23.39	81.40	12
Other Restaurants	23.78	82.75	12
Hospitality Suites	6.40	22.24	3
Entertainment	8.52	29.60	4
Retail Stores	25.04	87.13	13
Local Transportation	3.73	12.97	2
Other	13.32	46.42	8
TOTAL	193.25	672.47	100

Source: IACVB Convention Income Survey (1995 Update).

A survey conducted by Deloitte & Touche on behalf of the International Association of Convention & Visitors Bureaus polled Bureaus in 67 U.S. and six non-U.S. cities. The survey generated responses from more than 17,000 meeting delegates, associations, exhibitors and exposition service contractors. It covered the period June, 1992 to June 1993 to eliminate any bias created by seasonality. Updated data for 1995 was determined by applying the Travel Price Index (TPI) to the original figures in the 1993 report.

The 1995 update to the IACVB survey estimates that exhibitors spent an average of \$2,637.22 per event with an average event length of 3.02 days. Exhibitor expenses included food and beverage, hospitality suites,

advertising, equipment rental, hired services, meeting rooms and other expenses. Spending by exhibitors varies by scope, type, and size of event.

1.14.5 Types of Meetings

There are many different types of meetings which should be considered as part of the potential market share for a city. For example, the majority of corporate meetings are either training seminars, management meetings, or sales meetings. Ironically, the attendance at these meetings is the lowest, while incentive trips, professional/technical, and "other" meetings attract the largest audience.

**TABLE 1-21
PROFILE OF CORPORATE MEETINGS BY TYPE**

TYPE OF MEETING	MEETING PLANNERS INVOLVED	AVERAGE # PLANNED	AVERAGE # ATTENDEES	AVERAGE # DAYS DURATION
Incentive Trips	56%	2.7	95	3.9
Sales Meetings	53%	5.5	61	2.6
Management Meetings	48%	4.6	36	2.4
Training Seminars	47%	7.5	53	2.7
Professional/Technical Meetings	30%	4.1	68	2.7
New Product Introductions	15%	3.3	95	2.3
Stockholder Meetings	11%	1.7	33	1.7
Other Meetings	8%	11.7	87	3.2
Average	96%	13.0	62	2.8

Source: Meetings & Conventions (August, 1996)

Corporate meeting planners generally spend approximately 6 months planning a meeting. Association planners, on the other hand, enjoy a generous 10 month lead time in their planning efforts for meetings other than conventions.

1.14.6 Exhibits, Displays and Trade Shows

According to a meetings and conventions survey conducted by ASAE in 1995, the average number of expositions or trade shows remained at the same level as in 1994.

On average, each member held 1.2 shows in 1994 and 1995. The expositions or trade shows were almost always held in conjunction with a convention and lasted an average of 2.5 days.

The 1996 Meetings Market Report showed that the average exhibit space per convention more than doubled in 1995 to 46,100 net square feet.

	1993	1995
Less than 1,000	16%	7%
1,000 - 4,999	19%	19%
5,000 - 19,999	31%	32%
20,000 - 39,999	17%	15%
40,000 - 99,999	12%	15%
100,000 or more	5%	12%

Source: "Meetings and Conventions" Magazine (August, 1996)

1.14.7 Convention Site Selection

In selecting a meeting's destination, corporate and association meeting planners consider remarkably similar criteria.

In every case, affordability of the destination is the most important consideration, with the availability of hotels or convention facilities the next most important factor.

**TABLE 1-23
PLANNERS' SITE SELECTION PRIORITIES**

FACTORS CONSIDERED VERY IMPORTANT	CORPORATE MEETINGS	CONVENTIONS	ASSOCIATION MEETINGS
Affordability of Destination	67%	85%	73%
Availability of Hotel/ Other Facilities for Meetings	67%	65%	70%
Ease of Transportation	56%	51%	44%
Transportation Costs	48%	37%	38%
Distance Traveled by Attendees	44%	33%	44%
Climate	26%	26%	17%
Sight-seeing, Cultural, Other Extracurricular Activities	20%	24%	10%
Recreational Facilities	20%	20%	11%
Mandated by By-laws	-	17%	13%
Image of Location	-	14%	9%

Source: Meetings & Conventions (August 1996).

1.14.8 Rapid City Meetings & Conventions

The convention and meetings market in Rapid City has traditionally been limited in both size and scope. However, in the past ten years attendance at meetings and conventions has increased over 133%, and the addition of new facilities both at the Rushmore Plaza Civic

Center and The Dunbar and the Gold Mine in Deadwood promise to significantly improve the size and quality of the meetings facilities. Successful marketing of these facilities will have a positive impact on tourism in the Rapid City area, since convention delegates tend to stay longer and spend more than leisure visitors.

**TABLE 1-24
RAPID CITY CONVENTION HISTORY
1991-1995**

YEAR	# of Conventions	# of Delegates	Delegate Spending Per Day
1991	366	104,792	\$115
1992	376	110,694	\$120
1993	415	155,541	\$120
1994	458	176,329	\$120
1995	476	181,622	\$130
AVG.	418	145,796	\$121.00

The average number of delegates per convention is 349, which is slightly higher than comparable destinations. The average is skewed considerably by major statewide events, such as the Black Hills Stock Show and Rodeo, the State A Basketball Tournament, and the Black Hills Pow-Wows. According to the Rapid City Convention and Visitors Bureau, 60% of all conventions booked during the peak periods of June through October are national groups - which comply with the meeting planning profile presented earlier.

Most meetings and conventions not considered "special events" utilize a single hotel for their gatherings. The Howard Johnson Lodge & Convention Center (272 rooms), the Rushmore Plaza Holiday Inn (205 rooms), and the Radisson Hotel (180 rooms) garner the largest share of the meeting business in the community.

For larger conventions, the Rushmore Civic Plaza contains a total of 160,000 gross square feet of space. It includes an arena with 34,500 square feet and fixed seating for 5,000. Rushmore Hall with 40,068 square feet, and LaCroix Hall with 15,264 square feet of meeting space. These are divisible by soundproof, portable walls effectively allowing for simultaneous use. There are 28 meeting rooms.

Ceiling heights range from 20' to 58', floor loads are unlimited, and on-site kitchen facilities can provide banquet service for up to 1,300. There are both permanent and portable stages available. The facilities are maintained in excellent condition and are comparable to

what one would expect to find in much larger cities. Meeting spaces are comparable to mid-range hotel properties such as a Marriott or Hilton.

The space available in Rushmore Hall alone - coupled with the number of first-class committable hotel rooms - allows the convention center to host 88% of the meetings and trade shows in the country. Rapid City's per day spending by delegates is nearly \$60 per day lower than the national average, making the destination one of the most affordable in the nation for major meetings.

Price and availability of transportation rank third on the list of meeting planners criteria. Airfares which are significantly higher than competing cities and the limited availability of jet service is cited by both meeting planners and the local travel industry officials as the primary deterrent to increased meetings business in Rapid City, and the decline of future bookings over the past two years. According to lost business reports, the Presbyterian Church USA, National Association of State Directors of Teacher Education and Certification, and the Disabled American Veterans were the three largest meetings lost in 1996 specifically due to the above factors.

Population: The attractiveness of a convention destination is closely related to the total population within the area. Heavily populated cities frequently have better amenities, such as restaurants and entertainment attractions, allowing them to

host groups more effectively. Rapid City has a population of 54,523 with the total population of Pennington County being 81,343. This represents 11.6% of the total population of the state. The city's location in the upper Midwest puts it somewhat at a competitive disadvantage in that it is not near a major population center.

Denver is the closest major metropolitan region at 389 land miles, while Omaha is 528 miles, Minneapolis is 611 miles and Salt Lake City is 657 miles away.

Cost: Attending delegates confront unavoidable costs during their stays at meeting destinations. The costs of staying in Rapid City, estimated at \$130 per day for food, lodging, and inner-city travel, is relatively inexpensive when compared with other third tier cities in the competitive marketplace.

1.14.9 New Facilities

As noted, Rapid City's existing facilities package is extremely competitive in the marketplace it serves. For some time, there has been no in-state competition with a comparable package, although the construction of a new convention center and new hotels (including a 150 room convention complex in Sioux Falls) will alter the competitive landscape significantly.

The Rapid City region itself has two major new hotel construction projects underway near Deadwood. The Gold Mine, which ultimately will have 400 rooms, begins construction of 150 guest rooms and 15,000 square feet of meeting and exhibit space in the fall of 1997. The Dunbar Resort will be a 320 room golf and conference resort with 36,000 square feet of meeting space opening in 1999. Both properties will compete not only on the national level, but also with in-state and downtown Rapid City meeting facilities.

Representatives from the Gold Mine anticipate their market to be 70% leisure/30% meetings and conventions. The meetings market targeted will be primarily state or regional, with the majority of delegates using ground transportation for arrivals. Room rates will vary from \$75 to \$125.

Dunbar's representatives anticipate a much different positioning for that property. Dunbar's projections call for two-thirds of their guests annually to be conference delegates attending a meeting that is national in scope. Rather than competing against in-state facilities, they see The Dunbar's primary competitors as Lake Tahoe, Nevada, The Greenbrier in White Sulphur Springs, West Virginia, and The Broadmoor in Colorado Springs.

The Dunbar project calls for a 54 mile long railroad connecting the airport to the resort complex. This is in anticipation of 100,000 delegates arriving annually by air according to their marketing projections. Representatives project an initial annual occupancy rate of 60%, with occupancy exceeding 90% during the peak summer season. Room rates will vary from \$125 to \$250, and will increase to be commensurate with their perceived competitor's rates.

Hotel occupancy projections for both properties is in line with historic patterns for the Black Hills region. However, both are offering significantly higher rates than generally supported in the region. As indicated, the average delegate spending of \$130 per day in Rapid City includes lodging, meals, and entertainment.

1.15 Surrounding Land Use

An examination of community-wide land use and growth patterns is necessary in determining where future concentrations of residential, commercial, and industrial uses are likely to occur. Land use conflicts can be avoided by carefully studying alternatives for airport development while taking into consideration these land use patterns.

Land uses currently surrounding Rapid City Regional Airport include agricultural, and a small amount of rural residential. While the airport is city-owned and operated, it is not within the contiguous city limits. Pennington County does employ zoning, and has identified areas beyond airport boundaries that are impacted by aircraft operations. Currently, there are no identified land use/airport-related conflicts with regard to airport activities.

1.16 Surface Transportation Network

Transportation access to the airport is an important factor to be considered in the preparation of the master plan update. The transportation network impacts aviation demand in terms of direct access and travel time to the facility.

The primary transportation corridor in the Rapid City /West South Dakota Region area is U.S. Interstate 90. This is a four-lane, limited access highway running east and west in the region. It runs from Seattle to the west to Chicago to the east. North/south surface transportation is provided on State Highway 79.

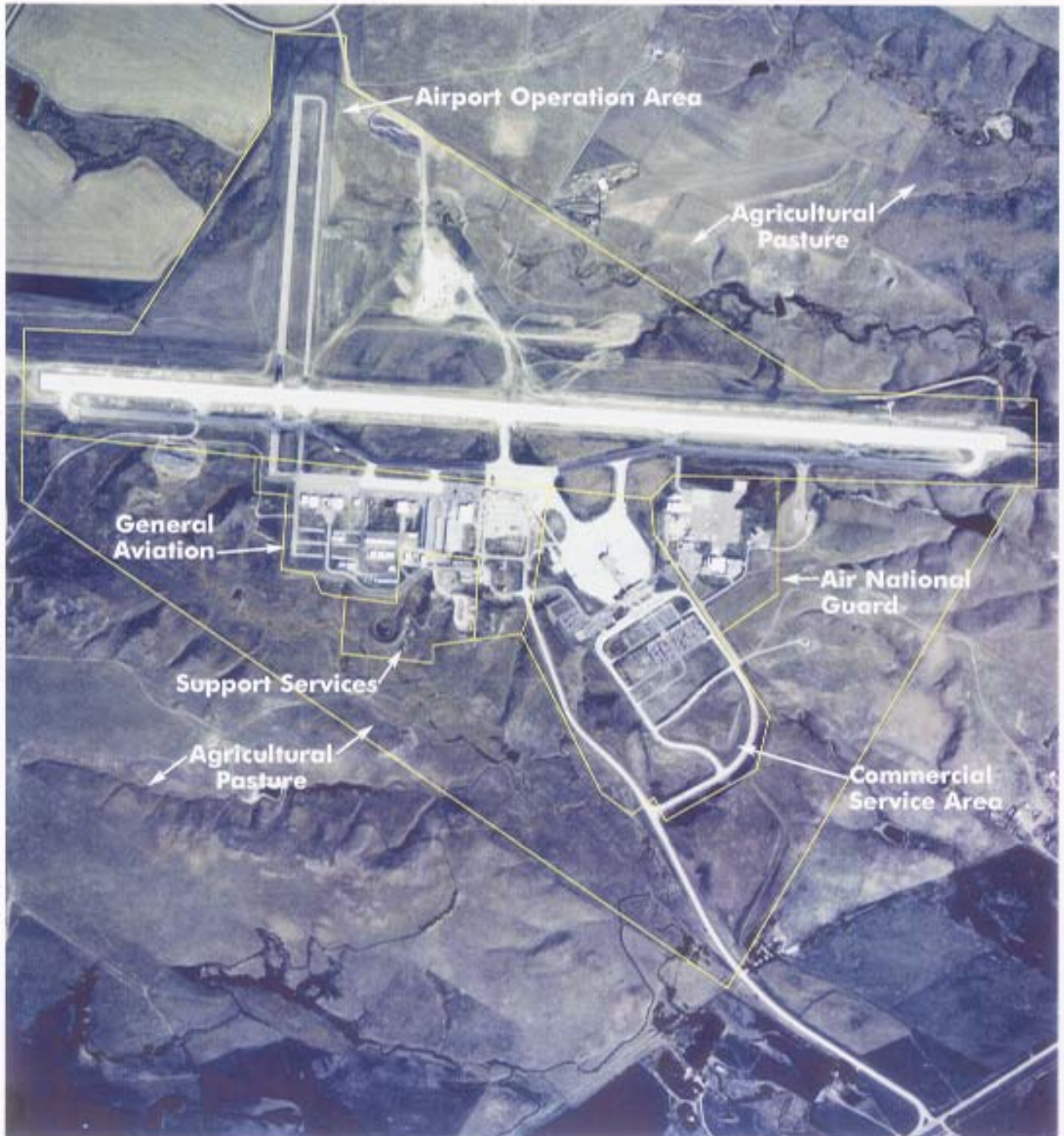
Several other Highways provide access to and from Rapid City and include State Highway 44 and U.S. Highway 16. Area transportation routes are illustrated on the Vicinity Map, Figure 1-1.

1.17 Climate

The climate in Rapid City/Western South Dakota is affected by northern cold fronts and from moist southern air. Summer months are warm and the average daily maximum temperature is 86°F during July. Winter temperatures are frigid, but mild winter temperatures are not uncommon. Snowfall averages 36 inches per year and total precipitation is 17 inches. Prevailing winds are from the north and shift to the north-northwest during the passage of cold fronts.

1.18 Inventory Summary

The information provided within the Inventory-Chapter One provides a background upon which the remaining elements of the master plan are produced. Information on current airport facilities and utilization will serve as a basis for the development of the forecasts of aviation activity and for the determination of future facility requirements.



Aerial photography provided by Horizons

Figure 1.7