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GALLATIN FIELD AIRPORT
MASTER PLAN UPDATE
TERMINAL FEASIBILITY STUDY

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GALLATIN FIELD AIRPORT
MASTER PLAN UPDATE/TERMINAL FEASIBILITY STUDY
CHAPTER 1 - INVENTORY

I. HISTORY OF GALLATIN FIELD

GALLATIN Field, southwestern Montana's major airport, began operating at its present site in 1941, and since those early days has undergone significant expansion and improvements to meet the continuing needs of increased passenger numbers. Today, Gallatin Field is served by Delta Air Lines, Northwest Airlines and Continental Airlines, as well as two commuter airlines, Horizon Air and Skywest Airlines. Additionally, current fixed base operator (FBO) service at the airport is provided by Sunbird Aviation, Arlin's Aircraft, John's Flying Service and Gallatin Flying Service.

Known as Siefert Airport and named for Gallatin County aviation pioneer Wayne Siefert, the area's first airfield was built in 1928 near Belgrade, but subsequently relocated because of high tension wires. Siefert, together with E. R. Kahla, secured land for a second airport through a lease agreement with the State of Montana and the Belgrade Chamber of Commerce. Located one-half mile north of Belgrade near the current site of Gallatin Field, the airport opened in 1929 with six 100-foot wide and 1200-1300 foot long runways.

Eleven years later in 1941, the Civil Aeronautics Administration (CAA) financed construction of Gallatin Field, after the City of Bozeman agreed to provide title to the runway areas and adjacent lands that would be improved.

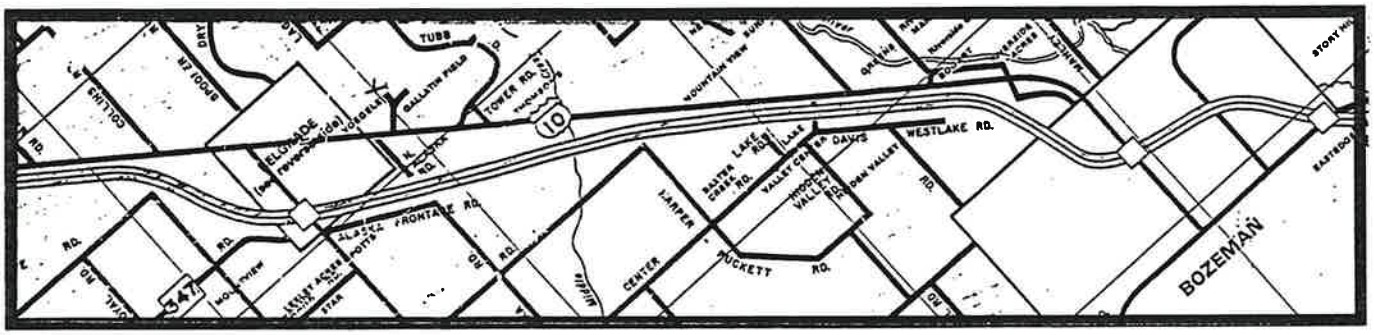
In order to provide a training school for pilots just prior to World War II, the CAA actively participated in the construction of the airport, which took place in mid-1941 and included four runways, each 4,700 feet long and 150 feet wide. John F. Lynch, who with his brother in 1940 offered the initial FBO service to the airport, took charge in late 1941 of the fastest growing air school in Montana.

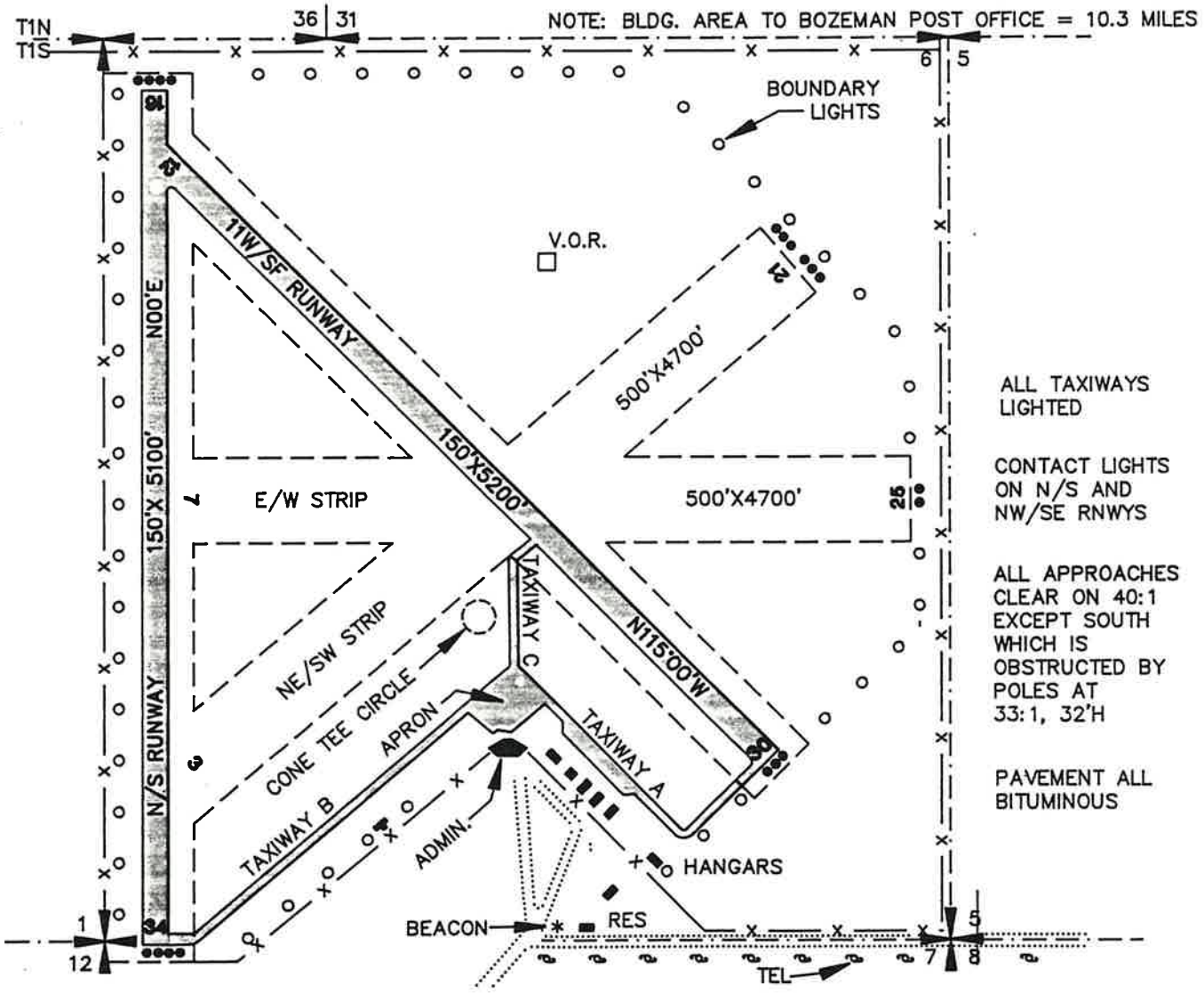
The 1940s heralded in the beginning of the airport's major construction era and included 5,400 feet of paved Runway 12-30, 5100 feet of paved Runway 16-34, turf Runways 3-21 (5,200 feet) and 7-25 (5,000 feet) and taxiways "A" and "B." The air carrier apron and lighting on Runways 16-34, 12-30 and taxiways "A and B" were also completed during the 1940s. Gallatin Field became a city-county airport in 1942, and Gallatin County purchased one half interest in the land in 1944. A 35 by 75-foot quonset hut was built in 1947 as a temporary "depot" for Northwest Airlines, which began regular commercial service in June of that year.

In 1950-1951 an airport administration building, designed by Fred Willson, was constructed for $153,000, $140,000 of which was funded through a county bond issue, with the remaining balance provided by the CAA. This building currently houses the FAA Flight Service Station and several construction management and architectural/engineering consulting firms.

Taxiway "C" was also constructed in 1951 to complete the airport layout shown in Figure 1-1 on the following page. Gallatin County levied a 0.9 mill tax designated for airport construction and maintenance during the 1950s.

GALLATIN FIELD AIRPORT
1951 AIRPORT - FACILITY SKETCH





N.A.P. YEAR							
PRES.CLASS	3	PROP.CLASS			SEC.6 T1S R5E	AIRPORT – GALLATIN FIELD	
					ELEV. 4461 C&GS	CITY – BOZEMAN (BELGRADE)	
					LAT. 45° 46' 30"	COUNTY – GALLATIN	
					LONG. 11° 09' 30"	STATE – MONTANA	
NO	REVISIONS		BY	DATE	DRAWN BY: PDA	DATA BY – CSK	DATE – 2/12/51

FIGURE 1-1

New construction to meet the growing needs of Gallatin Field was made possible by an airport bond issue passed in 1960 with $150,000 of the funding coming from local taxpayers and the remaining $135,000.00 from matching federal airport monies. Construction included reconstruction of 150-foot by 5410-foot pavement on Runway 12-30, a new 120-foot by 640-foot general aviation apron, air carrier apron reconstruction and expansion, reconstruction of taxiway "A" and new medium intensity lighting on Runway 12-30.

Runway 12-30 was extended to 6,500 feet in 1963, permitting use of the airport by transport aircraft such as the Douglas DC-6 or Lockheed Electra. Taxiway C and Taxiway D, which served Runways 12 and 16, were constructed in 1965.

Anticipated jet service by Northwest Airlines and Frontier Airlines necessitated a number of improvements be made in the late sixties to Gallatin Field. The main Runway 12-30 was extended and paved to 9,000 feet; Taxiway "C" was widened and overlaid, including new lighting, and the air carrier apron was again expanded and overlaid. The $606,000 price tag for the improvements would be paid for by a $285,000 bond issue approved by taxpayers in January 1968, and the remainder provided by the Federal Aviation Administration. The airport was additionally supported by a City and County tax levy for maintenance, operations and administration.

A FAA planning grant in 1972 resulted in development of the first Master Plan for Gallatin Field. Runway 16-34, the N-S Runway, was abandoned due to lack of use and cost of maintenance.

In December 1971, the Montana Legislature passed a bill authorizing the establishment of Airport Authorities in Montana, and in November 1972 Gallatin Field became an Airport Authority.

To facilitate construction of the new terminal, the Airport Authority sold revenue bonds in 1974 to finance a new FBO building, relocate Federal Aid Secondary (FAS) 290, the road around the west perimeter of the airport, relocate existing FBO buildings and construct a new general aviation apron. The Authority also set aside a total of 170 acres for an industrial park east of relocated Runway 3-21. The turf Runway 3-21 was relocated to permit closing the old crosswind runway due to the new terminal building construction.

In 1976, the Authority sold $2,400,000 of revenue bonds to construct a new 40,000 square foot terminal building, new air carrier apron, widen, strengthen and extend taxiways, construct new terminal access road and to extend water and sewer utilities to the new terminal building and the old terminal building. The Authority provided land to the Town of Belgrade for construction

of a sewage treatment facility (lagoons) and shared 50-50 in the cost of a 500,000 gallon water tank with the town. Total cost of the project was about $4,400,000.

Gallatin Field was honored in December 1978 as the recipient of a regional award for environmental design presented by the FAA and was recognized for its new airport terminal and work on its master plan. M.M. Martin, FAA director stated, "The building is highly functional and an outstanding example of use of design, art and architecture to enhance the compatibility of airport structures with their surrounding environment."

The 1980s was a decade marked by continued growth for Gallatin Field as a result of the Airport Improvement Program whereby the FAA provided a maximum of 90 percent of the funding for airport improvements. In addition to runway, taxiway, apron, and access road improvement projects, a 36-foot by 56-foot fire station was built in 1983, an addition to the snow removal equipment building was constructed in 1988, and a passenger terminal door replacement project was completed in 1990. Gallatin Field also acquired snow removal equipment, additional land, installed a security fence, upgraded the taxiway lighting system, and purchased an emergency standby generator. For a complete list of projects and funding sources from 1972-1992, see Table 1-1.

Also, during the 1980s, the third major carrier, Delta Airlines-previously Western Airlines, initiated service to Gallatin Field.

Strong, broad-based community support has enabled Gallatin Field to move from its simple beginnings through a succession of on-going expansion and improvements of both facilities and services to the viable position it now holds in Gallatin County. The efforts of dedicated and farsighted airport managers, John Lynch, 1941-1944, Joe Monger 1944-1956, Edwin Iverson, 1957-1970, Frank Wolcott, 1970-1981, and Ted Mathis, 1981-present and past board members, as well as the current Airport Authority Board members, Steve Williamson, James C. Taylor, Sue Leigland, Robert A. Taylor and Richard R. Roehm, have made it possible for Gallatin Field to contribute to the economic well-being of Gallatin County and its trade area.

TABLE 1-1
FEDERALLY FUNDED AIRPORT DEVELOPMENTS
1974-1992

YEAR	PROJECT	FAA PROJECT NO.	COST
1974	Electrical work at terminal building. Relocation of FAS 290, R/W 3-21 and connecting taxiways; enlarge G.A. apron; G.A. taxiway construction; boundary fence; emergency generator; relocation of irrigation ditch; site clearance new G.A. apron and building relocation.	A.D.A.P. 02	$1,300,000
1976	Elevated water tank and water system; sanitary sewer and storm drains; T/W lighting; pave taxiways, air carrier and G.A. apron, access road; striping of access road; security fence.	A.D.A.P. 04	$1,826,000
1977	R/W 12-30 overlay PFC and marking, snow removal equipment	A.D.A.P. 05	$ 726,000
1978	T/W lighting, extension of T/W A & E; marking; overlay T/W C	A.D.A.P. 06	$ 737,000
1979	R/W 12-30 medium intensity lighting	A.D.A.P. 07	$ 172,000
1983	36x56' fire station building and asphalt concrete apron; asphalt concrete driveway and parking lot; remove and relocate fence, gate. Snow plow truck, snowplow and sander; 1 ton 4 wheel drive truck and land acquisition.	A.I.P 01	$ 302,000
1980-1983	Land acquisition and Noise Study	A.I.P. 02	$1,168,000
1983	Bituminous fog seal and marking on Runway 12-30 relocate county road.	A.I.P. 03	$ 96,000
1984	Bituminous plant seal mix for apron, T/W, general aviation apron, general aviation T/W and access road; security fence.	A.I.P. 04	$ 801,000
1985	Pave Runway 3-21 and connecting taxiways; storm water and irrigation conduits; regrade safety area on Runway 12-30; security fence.	A.I.P. 05	$ 700,000
1986	Security fence, R/W 12-30 blast pads, improvements to terminal access road and airport service road.	A.I.P. 06	$ 528,000
1986	High speed runway sweeper; upgrade radio security radio system.	A.I.P. 07	$ 90,000
1988	R/W 12-30 overlay and shoulder stabilization; reconstruction of T/W lighting system and shoulder stabilization; snow removal equipment building.	A.I.P. 08	$1,768,000
1990	Terminal door replacement; truck mounted sander unit; 4 wheel drive loader.	A.I.P. 09	$ 280,000
1990	Pave airport service roads and emergency standby generator.	A.I.P. 10	$ 323,000
1990	Airport Rescue Fire Fighting Vehicle	A.I.P. 11	$ 308,000
1991	Gallatin Field Airport Master Plan Update/Terminal Feasibility Study	A.I.P. 12	$ 120,800
1991	Snow Blower	A.I.P. 13	$ 235,000
1992	Accell/Decell Lanes, T/W Guidance Signing Safety Area Improvements	A.I.P. 14	$ 510,000

II. AIRPORT FACILITIES

Located one-half mile east of Belgrade and eight miles northwest of Bozeman, Gallatin Field Airport (latitude North 45°46.8' and longitude West 111°09.2') lies towards the center (N-S) of the East Gallatin River Valley and about 10 nautical miles to the west of the Bridger Mountain Range.

The Airport Authority owns approximately 1600 acres of land in fee, has airport construction easements over 600 acres of state land and a lease agreement on slightly over five acres. In addition, the airport has Runway Protection Zone easements over 45 acres. Gallatin Field is zoned by the City of Belgrade as "PL-1" (Public Lands 1). There is some Business-2 (B-2) zoning south of Gallatin Field and a small area of Residential 2 (R-2) is located off of the northwest corner of the airport property. The land to the north and east of the airport is not zoned.

Buildings

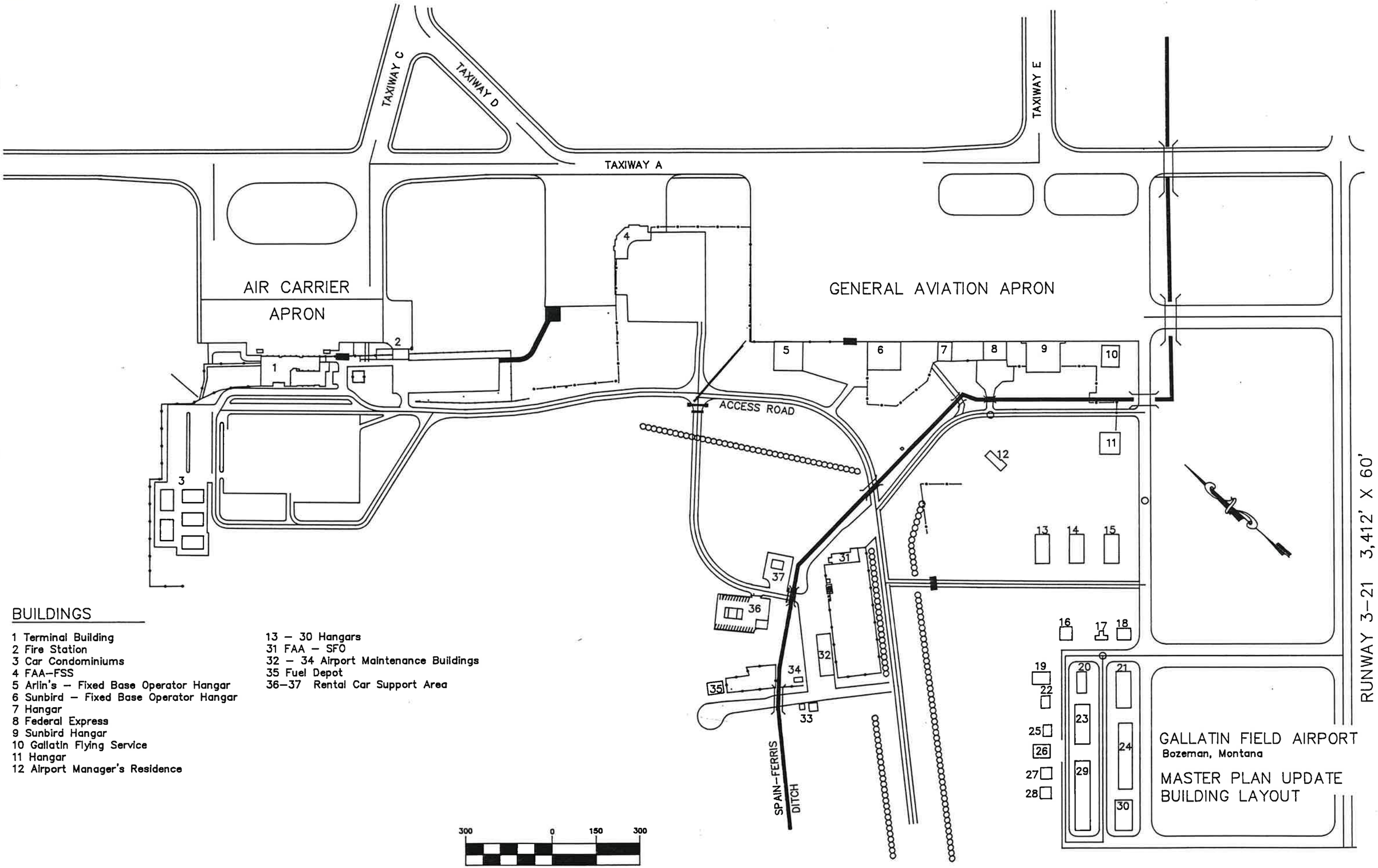
Constructed in 1977-1978 at a cost of $1,680,000, the terminal building currently houses commercial air carrier operations, baggage handling, concessions, a restaurant, lounge, car rentals, the airport manager's office, passenger waiting and secured hold areas. Table 1-2 reflects the current uses of the terminal building.

TABLE 1-2
GALLATIN FIELD
BOZEMAN, MONTANA
Passenger Terminal Building Square Footage

I.	Revenue Areas		
	Airline Exclusive Use	6891	
	Airline Common Use	9903	
	Subtotal Airline Use		16,794
	Concession	5520	
	Airport Administration	660	
	Subtotal Concession		6,180
	Total Revenue Areas		22,974
II.	Public Areas		8,442
III.	Other Areas		
	Mechanical First and Second Floor	375	
	Basement Mechanical	9725	
	Subtotal Other Areas		10,100
	Total Building Area		41,516

Figure 1-2 shows the layout of the air carrier terminal site, the general aviation aprons and the relationship of buildings on the airport property. Gallatin Field owns the terminal building (1) fire station (2) FAA-FSS building (4) Sunbird Aviation Building (6) airport manager's residence (12) a portion of a hangar (21), the old National Guard complex (31) and an equipment maintenance building (32).

Presently there is hangar space for 80 aircraft.



BUILDINGS

1 Terminal Building
2 Fire Station
3 Car Condominiums
4 FAA–FSS
5 Arlin's – Fixed Base Operator Hangar
6 Sunbird – Fixed Base Operator Hangar
7 Hangar
8 Federal Express
9 Sunbird Hangar
10 Gallatin Flying Service
11 Hangar
12 Airport Manager's Residence
13 – 30 Hangars
31 FAA – SFO
32 – 34 Airport Maintenance Buildings
35 Fuel Depot
36–37 Rental Car Support Area

Fig 1–2

Navigation Aids

Navigation aids may be separated into two general classifications: en-route navigation aids, and terminal area navigation and landing aids. In flight aircraft using instruments only can utilize en-route navigation aids such as Non-Directional Beacon (NDB); Very High Frequency Omnidirectional Range (VOR); Distance Measuring Equipment (DME); Tactical Air Navigation (TACAN): and Very High Frequency Omnidirectional Range/Tactical Air Navigation (VORTAC) to achieve accurate navigation. Gallatin Field has a collocated VOR/DME navigational aid located north of runway 12-30 at approximately mid-field, and an NDB (compass locator station) installed at the ILS Outer Marker 8 miles west of the airport

Terminal area navigation and landing aids include Instrument Landing Systems (ILS), Precision Approach Radar (PAR) and Microwave Landing Systems (MLS). Runway 12 of Gallatin Field is equipped with an ILS that provides continuous vertical and horizontal guidance to landing aircraft by identifying the position of the aircraft relative to the correct glide path and the extension of the Runway 12-30 centerline. The PAR and MLS may be installed in the future at Gallatin Field, particularly if the FAA constructs and operates a Control Tower.

Additional landing aids at the airport include an airport beacon, (rotating green and white), a lighted wind cone, a segmented circle, runway end identifier lights (REIL Runway 30), medium intensity approach lighting system with runway alignment indicator lights (MALSR Runway 12), visual approach slope indicators (VASI Runway 12 and 30) and a FAA Flight Service Station.

The Flight Service Station (FSS) gives pilots weather and navigational information 24 hours a day. The FAA is planning, however, to service the entire state with a single FSS, located in Great Falls, Montana. Gallatin Field has been selected as a remote FSS and will continue to provide 24-hour weather observations. Pilot briefings will be provided on a hourly reduced workday.

Runways

Gallatin Field has two active Runways, 12-30 and 3-21. Runway 12-30, an instrument runway, is used by air carriers and general aviation airplanes; the crosswind Runway 3-21 is a visual runway used by general aviation aircraft weighing less than 12,500 pounds.

Runway 12 has a precision instrument approach equipped with an ILS, a four-box Visual Approach Slope Indicator (VASI-4) and Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR). Runway 30 has a visual approach with a four box VASI-4 and Runway End Identifier Lights (REIL).

Runway 3-21 is 3,412 feet long by 60 feet wide. The runway has no runway lights or navigational aids. Table 1-3 provides additional information on the physical characteristics of the runways and Figure 3 shows the runway, taxiway and apron layout.

TABLE 1-3
RUNWAY CHARACTERISTICS

RUNWAY	LENGTH	WIDTH	DESIGN GROUP	SURFACE	SINGLE WHEEL	DUAL WHEEL	DUAL TANDEM	RUNWAY LIGHTING
12-30	9,000	150'	C IV	ASPHALT (PFC)	140,000	200,000	400,000	M.I.
3-21	3,412	60'	B I	ASPHALT (PFC)	12,500	---	---	NONE

Taxiways

Parallel Taxiway "A" connects opposite ends of Runway 12-30. A distance of 750 feet separates the centerline of the Runway from the taxiway centerline. Taxiways "B", "C," and "D" provides intermediate access from "A" to Runway 12-30. For specific widths, lengths, pavement type and strength and taxiway lighting, see Table 1-4 below:

TABLE 1-4
AIRPORT TAXIWAY DATA

	Width & Design Group	Surface	Single Wheel	Dual Wheel	Dual Tandem	Lighting
A	75'-90' IV	Asphalt, PFC	140,000	200,000	400,000	M.I.
B,C,D & E	75' IV	Asphalt, PFC	140,000	200,000	400,000	M.I.

* M.I. - Medium Intensity

Aprons

The 627-foot by 340-foot commercial air carrier apron on the northeast side of the terminal building consists of 146,231 square feet of asphaltic concrete pavement and 94,125 square feet of concrete portland cement pavement. The ramp parking area can presently accommodate up to three 727 type aircraft. The apron strength is equivalent to that of Runway 12-30.

The 435-foot by 1340-foot general aviation apron begins approximately 1500 feet to the southeast of the terminal building, has 582,900 square feet of asphaltic concrete pavement and 71 aircraft tie-down positions for light aircraft.

ARFF and Snow Removal Equipment

Aircraft Rescue and Fire Fighting (ARFF) equipment owned by the Airport includes a Walters Crash/Fire/Rescue truck, and a Model 1500 Oshkosh Fire Truck. Snow removal equipment owned by Gallatin Field includes two rotary snow blowers, a broom blower truck, two front-end loaders and three dump trucks with 12-foot blades.

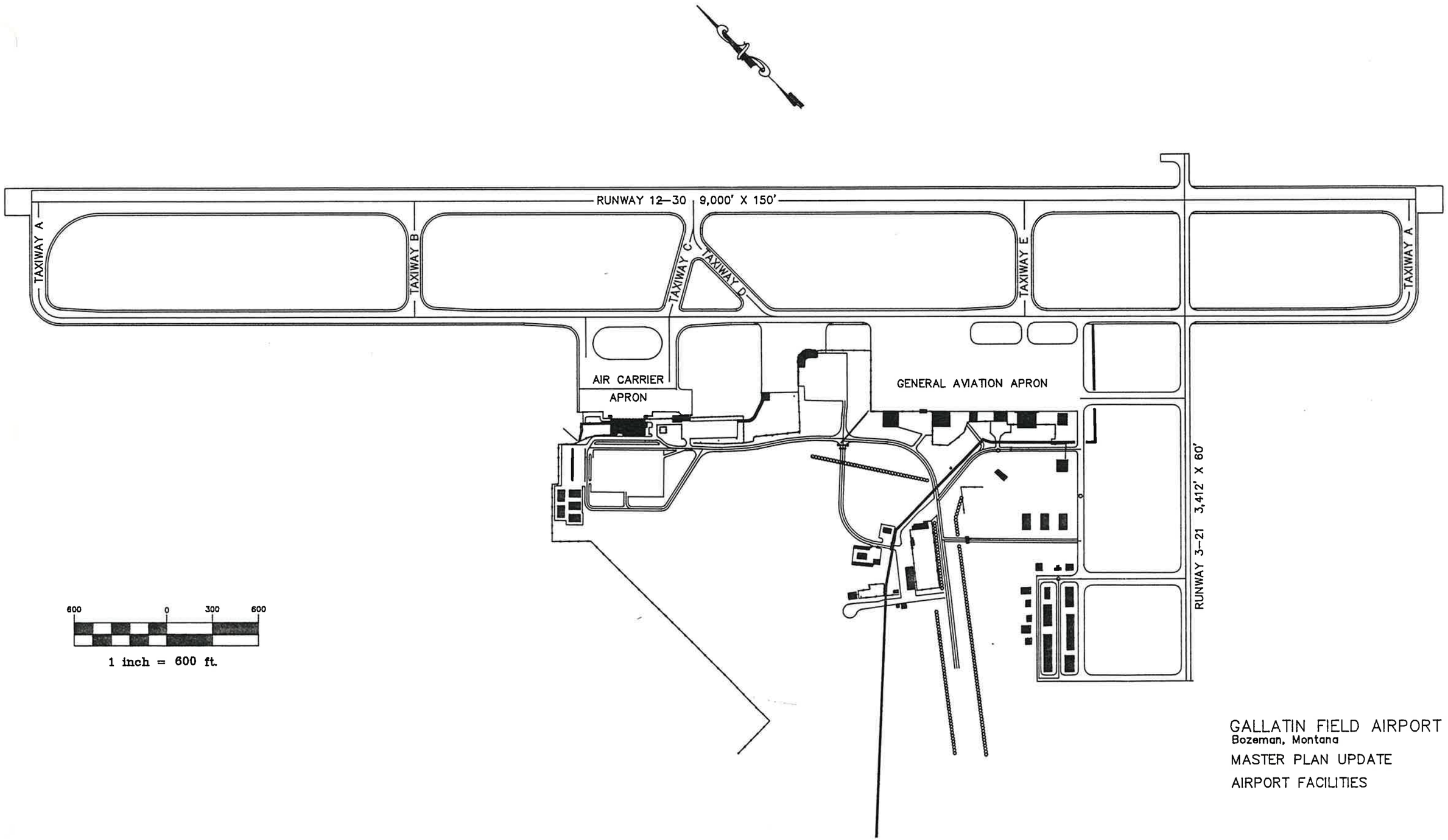
Utilities

Gallatin Field is connected to the City of Belgrade's water and sewage systems, receives electrical power and natural gas from the Montana Power Company and telephone service through the U.S. West exchange in Belgrade.

Access

U.S. Highway 10, a two-lane paved road is the primary access to Gallatin Field. One and one-half miles southwest of the airport entrance on Highway 10 is the Belgrade Interchange to Interstate 90 and seven and one-half miles to the southeast in Bozeman is the Seventh Avenue Interchange to the same Interstate Highway.

A two-lane paved road, approximately three-quarters of a mile long from U.S. Highway 10, leads to the terminal building and other airport facilities. The one-way loop road around the public parking lot moves traffic flow through the terminal loading zone and to the parking facilities that include a 280-space public parking area, 193 spaces for car rental vehicles, 98 spaces for employees, and 36 spaces for ready-rental cars.



600 0 300 600

1 inch = 600 ft.

GALLATIN FIELD AIRPORT
Bozeman, Montana
MASTER PLAN UPDATE
AIRPORT FACILITIES

FIG. 1–3

Approaches

Safety requirements during takeoff and landing demand that imaginary surfaces extending from runway ends called "approaches" are either owned or controlled by airports.

A civilian airport approach, as defined in the FAA's Federal Aviation Regulations (FAR) Part 77.25, is a surface longitudinally centered on the extended runway centerline and extending upward and outward from each end of the primary surface. The inner width of the approach surface is the same width as the primary surface.

The primary surface is centered longitudinally on a runway and extends 200 feet beyond each end of the runway. The width of the primary surface depends upon the existing or planned approach (ie. visual, nonprecision, precision) for the runway. In a case such as Runway 12-30, where Runway 12 has a precision approach and Runway 30 has a visual approach, the inner width of the visual approach would be the same as the more critical precision approach.

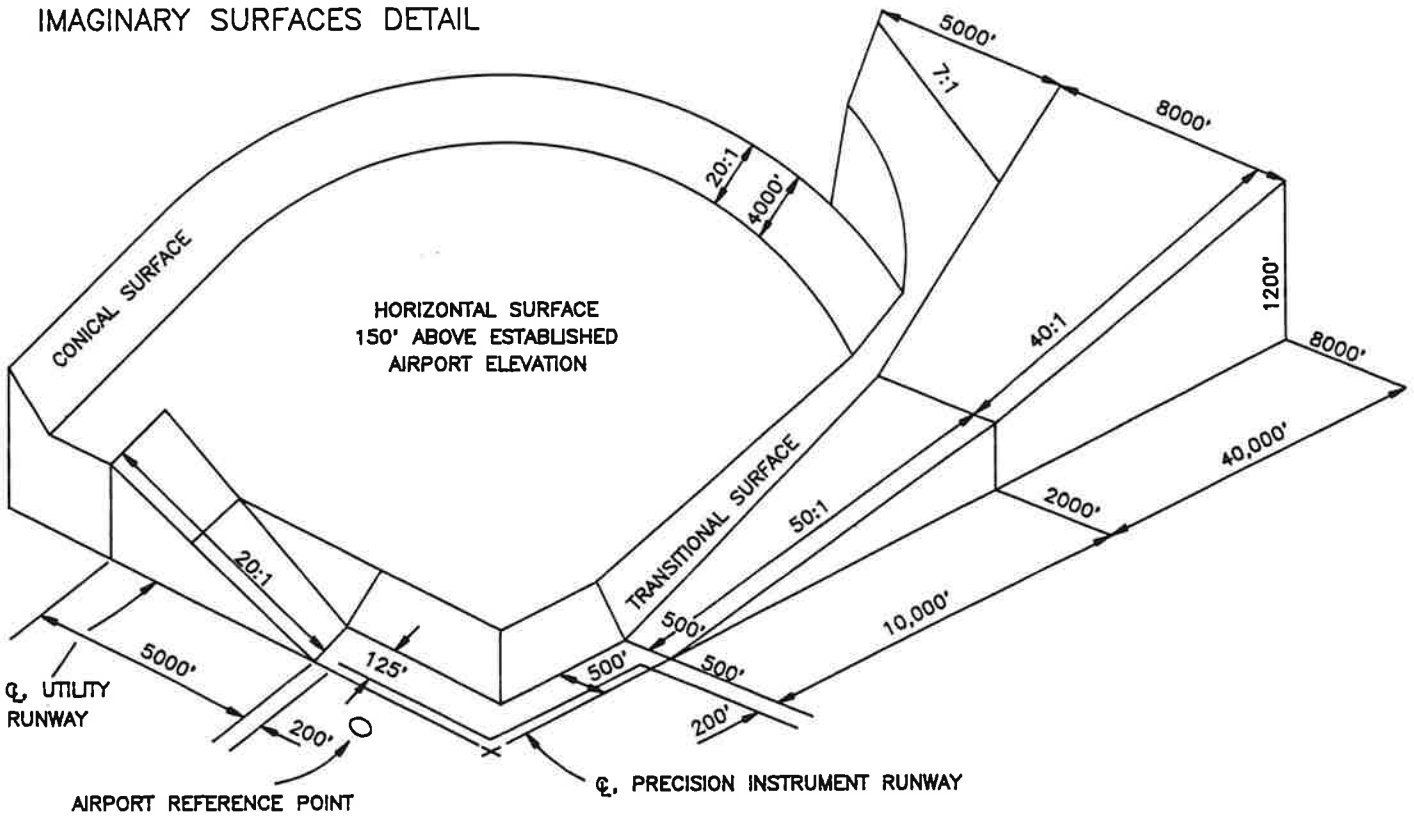
The minimum allowable "vertical" slope of the approach surface, as determined in FAR Part 77.25, also depends on the type of approach. For precision instrument runways, the outer portion of the approach slope is 40:1 (horizontal to vertical) and the inner portion is 50:1. For nonprecision instrument approaches, the slope is 34:1, while visual approaches require 20:1.

Objects such as trees, towers, buildings or terrain determine the approach slope ratio. Any object which penetrates the FAR Part 77 approach surface is considered an "obstruction." The FAA determines if the obstruction is an aviation hazard which must be lighted, removed or dealt with in some other manner acceptable to the FAA.

FAR Part 77 approach surfaces criteria which apply to the Gallatin Field Airport are shown in Table 1-5.

A 50:1 approach means that for every 50 feet measured outward (horizontally), the approach surface slopes upward (vertically) one foot. For example, the required approach surface for Runway 12 begins 200 feet beyond the runway threshold and is 1,000 feet wide at this location. The approach surface extends 10,000 feet horizontally at a 50:1 slope, and then extends an additional 40,000 feet horizontally at a 40:1 slope. Therefore,

the approach surface extends 50,000 horizontal feet beyond the primary surface and rises 1,200 feet above the runway threshold. The approach surface is 1,000 feet wide at the end of the primary surface (200 feet from the Runway 12 threshold) and expands to 16,000 feet wide at a point 50,000 feet from the end of the primary surface. Figure 1-4 illustrates the imaginary surfaces at Gallatin Field.



GALLATIN FIELD AIRPORT
Bozeman, Montana

MASTER PLAN UPDATE

FIG. 1–4

TABLE 1-5
FAR PART 77 APPROACH SLOPE REQUIREMENTS
GALLATIN FIELD AIRPORT

RUNWAY CATEGORY	RUNWAY	INNER EDGE	OUTER EDGE	HORIZONTAL DISTANCE	SLOPE
Precision Instrument*	12	1,000'		10,000'	50:1
			16,000'	40,000'	40:1
Visual Runways Serving Larger Aircraft	30	1,000'	2,000'	5,000'	20:1
Visual Runway	3 & 21	500'	1,250'	5,000'	20:1

* A precision instrument approach requires a 50:1 slope extending for 10,000' and additional 40:1 slope extending for 40,000'. Runway 30 is a future nonprecision or precision instrument runway.
Source: Federal Aviation Regulations Part 77.25

III. AIRSPACE UTILIZATION

While in flight, aircraft may occupy one of two vertically separated airspaces or airways classified in the United States as, "Victor" and "Jet." Victor airways extend from the Minimum En-route Altitude (or minimum safe altitude) up to but not including 18,000 feet above sea level (MSL) and are also known as the VOR system or low altitude federal airways. Jet routes extend upward from 18,000 feet. Victor airways and Jet routes in the vicinity of Gallatin Field Airport are shown on Figure 1-5.

Along with Victor airways and Jet routes, there are also three military training routes in the vicinity of the airport. Military training route IR 301 is located approximately 35 miles southwest of Butte, IR 313 is approximately 30 miles to the south of Bozeman, and the third route is midway between Big Timber and Billings. These routes are also shown on Figure 1-5. Pilots should refer to sectional charts for locations of military training routes, as they are subject to change.

Presently and in the foreseeable future, Gallatin Field is sufficiently separated from nearby airports to prevent air space conflicts. The closest year around airports to Gallatin Field with instrument flight operations are Helena (95 miles) and Butte (82 miles). The nearest public airport serving small aircraft is Progreba Field in Three Forks, 22 air miles west of Gallatin Field. Although pleasure flying and flight instruction are conducted from that airport, its primary function is to serve agriculture, small local industry and recreation.

West Yellowstone airport, 90 miles to the south, is seasonal, with the ILS and other navigational aids operational June through September.

AIRSPACE UTILIZATION CHART
GALLATIN FIELD AIRPORT

TOPOGRAPHIC INFORMATION

- Roads
- Railroad
- Bridges And Viaducts
- Power Transmission Line
- Aerial Cable
- Mines And Quarries
- Lookout Tower
- 618 (Elevation Base Of Towe
- Race Track
- Tank-water, oil or gas
- Oil Well • Water Well
- Mountain Pass
- 1369 (Elevation of Pass)
- Outdoor Theater

AIRPORTS

- Other than hard-surfaced runways
- Hard-surfaced runways 1500 ft. to 8000 ft. in length
- Hard-surfaced runways greater than 8000 ft.
- Seaplane Base (SPB)

All recognizable hard-surfaced runways, including those closed, are shown for visual identification.

ADDITIONAL AIRPORT INFORMATION

- (R) Private "(Pvt)" – Non-public use having emergency or landmark value.
- Military – Other than hard-surfaced. All military airports are identified by abbreviations AFB, NAS, AAF, etc. For complete airport information consult DOD FLIP.
- VHF OMNI RANGE (VOR)
- VORTAC
- VOR-DME
- Non-Directional Radiobeacon
- ☆ Rotating light in operation Sunset to Sunrise.
- JET
- MILITARY
- VICTOR

FIG. 1-5

Currently, Gallatin Field has 14 commercial flights daily: Delta, 5; Northwest, 3; Continental, 4; Horizon 2;. See Table 1-6 for flight numbers, times and destinations.

TABLE 1-6
GALLATIN FIELD, BOZEMAN, MONTANA
AIRLINE FLIGHT SCHEDULE

Flight#	Arrives: Departs:	From:	To:	Aircraft
DL 1157	6:30 a.m. 7:00 a.m.	Butte	Salt Lake City	727
CO 1602	7:48 a.m. 8:10	Missoula	Denver	727
NW 646	--- 8:10 a.m.	Bozeman	Billings Minneapolis/St. Paul	DC-9 727
AS 2371	--- a.m. 8:45 a.m.	Bozeman (Sunday Only)	Butte Spokane	Metro
NW 1762	--- 9:00 a.m.	Bozeman (Sunday Only)	Minneapolis/St. Paul	DC-9
AS 2322 AS 2375	10:50 a.m. 11:10 a.m.	Spokane (Except Sunday)	Spokane	Metro
DL 1647	12:05 p.m. 12:30 p.m.	Salt Lake City	Butte	DC-9
NW 1045 NW 1046	12:06 p.m. 12:50 p.m.	Billings Minneapolis/St.Paul	Billings Minneapolis/St.Paul	727 MD80
AS 2314 AS 2467	12:50 p.m. 1:10 p.m.	Spokane (Saturday Only)	Spokane	Metro
NW 1761	1:17 p.m. ---- p.m.	Minneapolis/St.Paul (Saturday Only)	Bozeman	DC-9
CO 1091	1:30 p.m. 1:50 p.m.	Denver	Missoula	727
DL 1486	2:08 p.m. 2:35 p.m.	Butte	Salt Lake City	727
NW 1047 NW 1048	2:07 p.m. 3:20 p.m.	Billings Minneapolis/St.Paul	Billings Minneapolis/St.Paul	DC-9
CO 1747 CO 1747	3:47 p.m. 4:07 p.m.	Missoula	Denver	727
DL 1602 DL 703	5:20 p.m. 6:05 p.m.	Salt Lake City	Salt Lake City	737
AS 2388 #AS 2303	7:30 p.m. 7:50 p.m.	Missoula & Spokane (Except Saturday)	Helena	Metro
NW 1515	9:45 p.m.	Billings Minneapolis/St. Paul	Bozeman	727 DC-9
CO 1259 CO 1259	9:20 p.m. 9:45 p.m.	Denver	Missoula	727 737
DL 930	10:20 p.m. 10:40 p.m.	Salt Lake City	Butte	727

Effective 2/01/93 TO 4/05/93 AS - Horizon CO - Continental
DL - Delta NW - Northwest

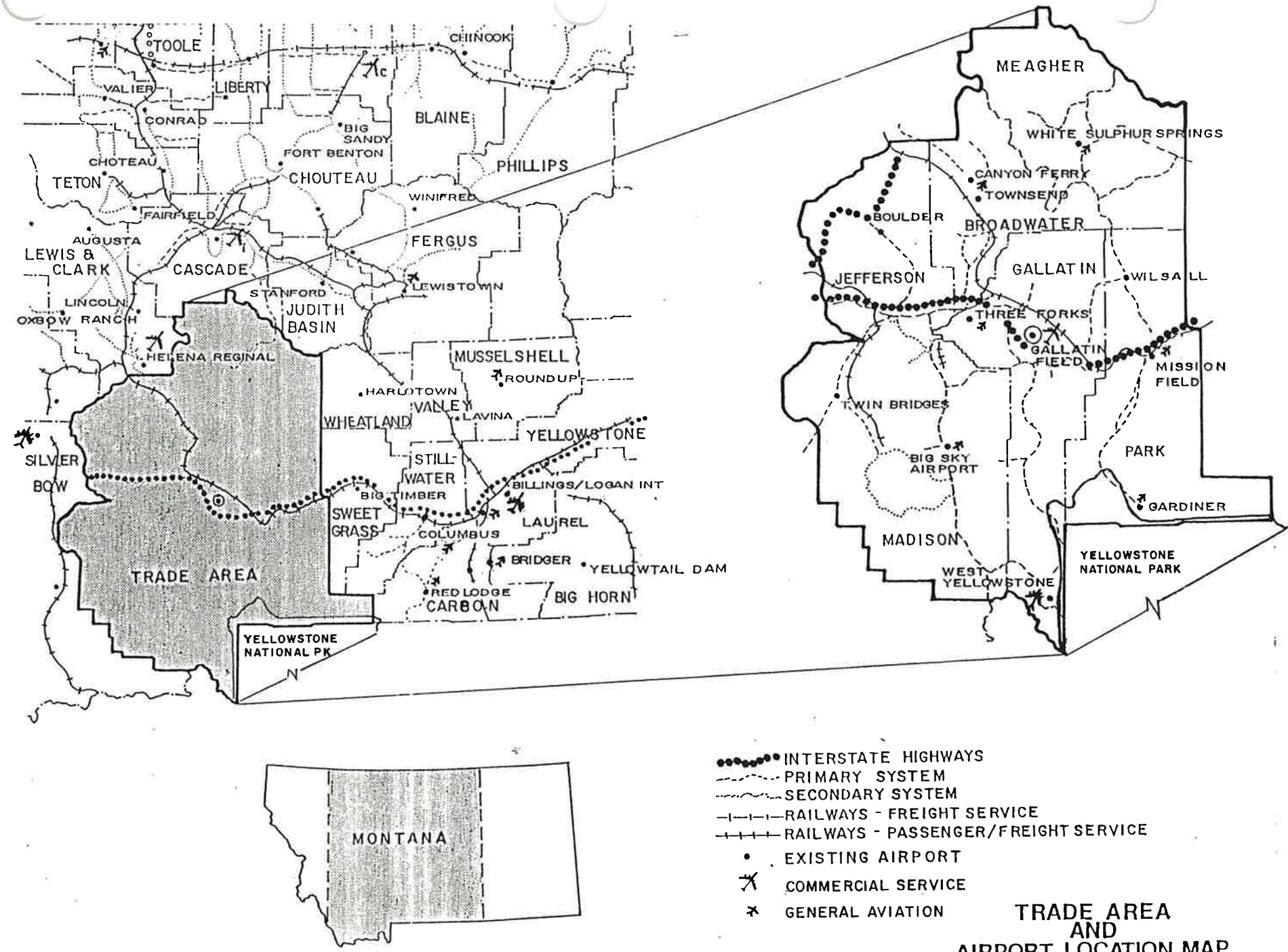
On Saturday Night, AS 2303 does not leave.
It stays overnight and leaves Sunday morning as AS 2371.

Area Airports

Gallatin Field is the only air carrier airport within the six-county area of Broadwater, Gallatin, Jefferson, Madison, Meagher and Park counties. However, the Bert Mooney Airport in Butte and the Helena Regional Airport service areas overlap the edges of the Gallatin Field trade area. The state owned Yellowstone Airport at West Yellowstone has supported seasonal air carrier and commuter service in the past and may do so again in the future. General aviation airports in the six-county area are listed in Table 1-7 below, and their location is shown on Figure 1-6. Additionally, there are a number of small private airstrips.

TABLE 1-7
AREA GENERAL AVIATION AIRPORTS

COUNTY AIRPORT	ORIENTATION	LENGTH	RUNWAY SURFACE	LIGHTS
BROADWATER COUNTY				
CANYON FERRY	16/34	3,200	TURF	NONE
TOWNSEND	16/34	4,000	ASPHALT	M.I.R.L.
GALLATIN COUNTY				
THREE FORKS	2/20	4,100	ASPHALT	M.I.R.L.
W YELLOWSTONE	1/19	8,400	ASPHALT	H.I.R.L.
JEFFERSON COUNTY				
BOULDER	11/29	3,650	TURF	NONE
MADISON COUNTY				
ENNIS (BIG SKY)	16/34	4,700	ASPHALT	M.I.R.L.
ENNIS (SPORTSMAN'S FIELD)	18/36	3,667	GRAVEL	NONE
TWIN BRIDGES	16/34	4,300	ASPHALT	M.I.R.L.
MEAGHER COUNTY				
WHITE SULPHUR SPRINGS	1/19	6,100	ASPHALT	M.I.R.L.
PARK COUNTY				
LIVINGSTON	4/22	5,700	ASPHALT	M.I.R.L.
GARDINER	10/28	3,215	TURF	L.I.R.L.
WILSALL	1/19	3,100	TURF	NONE



TRADE AREA AND AIRPORT LOCATION MAP

FIGURE 1-6

Air Carrier Landing Minimums

Minimum conditions during periods of poor weather are established by the FAA using procedures in the "Terminal Instrument Procedures (TERPS) Manual," which is published jointly by the FAA and Departments of the Army, Navy and Air Force. The terrain around Gallatin Field permits an excellent minimum decent altitude of 200 feet above ground level (AGL) with a minimum visibility of one-half mile. The instrument landing minimums at Gallatin Field are compared to Butte, Helena and Billings shown in Table 1-8.

TABLE 1-8
AIR CARRIER ILS LANDING MINIMUMS - AREA AIRPORTS

CITY	AIRPORT	CEILING (AGL)	MIN. VISIBILITY (MILES)
BILLINGS	LOGAN INTERNATIONAL	200'	1/2
BOZEMAN	GALLATIN FIELD	200'	1/2
BUTTE	BERT MOONEY	1000'	3
HELENA	HELENA REGIONAL	200'	1/2

Meteorological

Of all the meteorological variables, wind has, by far, the greatest impact on airport design, and therefore, is the primary factor in determining runway alignment. Generally, runways are aligned with the direction of the prevailing wind to minimize crosswind interference. To determine the dominant direction of prevailing winds, a "wind rose" is developed to plot the percentage of time that winds of given velocities come from the different compass headings and wind velocity. Once a wind rose has been completed for a given site, it can be used to check the "wind coverage," of specific runway alignments on the wind rose. From this, the percentage of time that crosswinds will be equal to or less than the specified velocity for each runway alignment can be calculated. The FAA recommends that an airport have a minimum of 95 percent wind coverage for a 10.5 knot crosswind component for aircraft weighing 12,500 lbs or less. Aircraft weighing less than this may not be able to safely operate in a crosswind greater than 10.5 knots. Heavier aircraft, however, can operate safely in crosswinds up to 13 knots. If 95 percent

coverage cannot be realized on one runway, a combination of two or more runways may be justified.

To update the wind analysis for the Gallatin Field runways, five individual wind roses were completed based on data gathered by the Bozeman Flight Service Station, which records wind speed and direction on an hourly basis. The data was sorted and summarized for the months of October 1989 through March 1991. A summary of the 11,339 wind readings is provided below in Table 1-9. The five wind roses are shown on Figures 1-7 through 1-11.

TABLE 1-9
WIND DATA
OCTOBER 1989 - MARCH 1991

HOURLY OBSERVATIONS OF WIND SPEED (KNOTS)

DIRECTION	SPEED (KNOTS) 0-3	4-6	7-10	11-16	17-21	22-27	28-33	24-40	41 OVER	TOTAL
1	15	114	38	2	2					171
2	10	75	18	1						104
3	17	86	19	1						123
4	10	95	21	6	1					133
5	14	94	26	4	1					139
6	12	97	29	5						143
7	16	102	22	7						147
8	20	86	34	3						143
9	24	117	24	1						166
10	21	142	37	2						202
11	29	191	52	3	2					277
12	20	258	82	7	1					368
13	38	316	121	20	2					497
14	23	346	146	21						536
15	36	387	162	32	1					618
16	34	390	184	27						635
17	45	367	140	21	3					576
18	47	304	108	13	2					474
19	37	213	54	12						316
20	18	148	49	16	4					235
21	18	165	70	56	14	1				324
22	25	127	93	108	26	8				387
23	25	147	109	173	49	10				513
24	19	153	130	107	35	6				450
25	16	140	138	96	23	6				419
26	9	120	101	67	9	2				208
27	21	131	133	84	12	1				382
28	16	102	97	56	11					282
29	11	103	110	63	19				1	307
30	12	153	111	64	15	2		1		358
31	10	119	120	61	8	2				320
32	11	120	89	44	9	1				274
33	17	124	106	36	5					288
34	22	133	88	24	3					270
35	15	115	73	16	1					220
36	17	141	65	10	1					234
TOTAL	750	6021	2999	1269	259	39	1	1		11339

Using the above information, wind roses were completed and wind coverage calculated for Runway 12-30 @ 10.5 knots, Runway 12-30 @ 13 knots, Runway 3-21 @ 10.5 knots, a combination of Runway 12-30 @ 10.5 knots and 3-21 @ 10.5 knots and Runway 12-30 @ 13.0 knots and 3-21 @ 10.5 knots.

Previous wind roses completed for Gallatin Field on data from January 1965 through December 1969 are compared to the present results in Table 1-10.

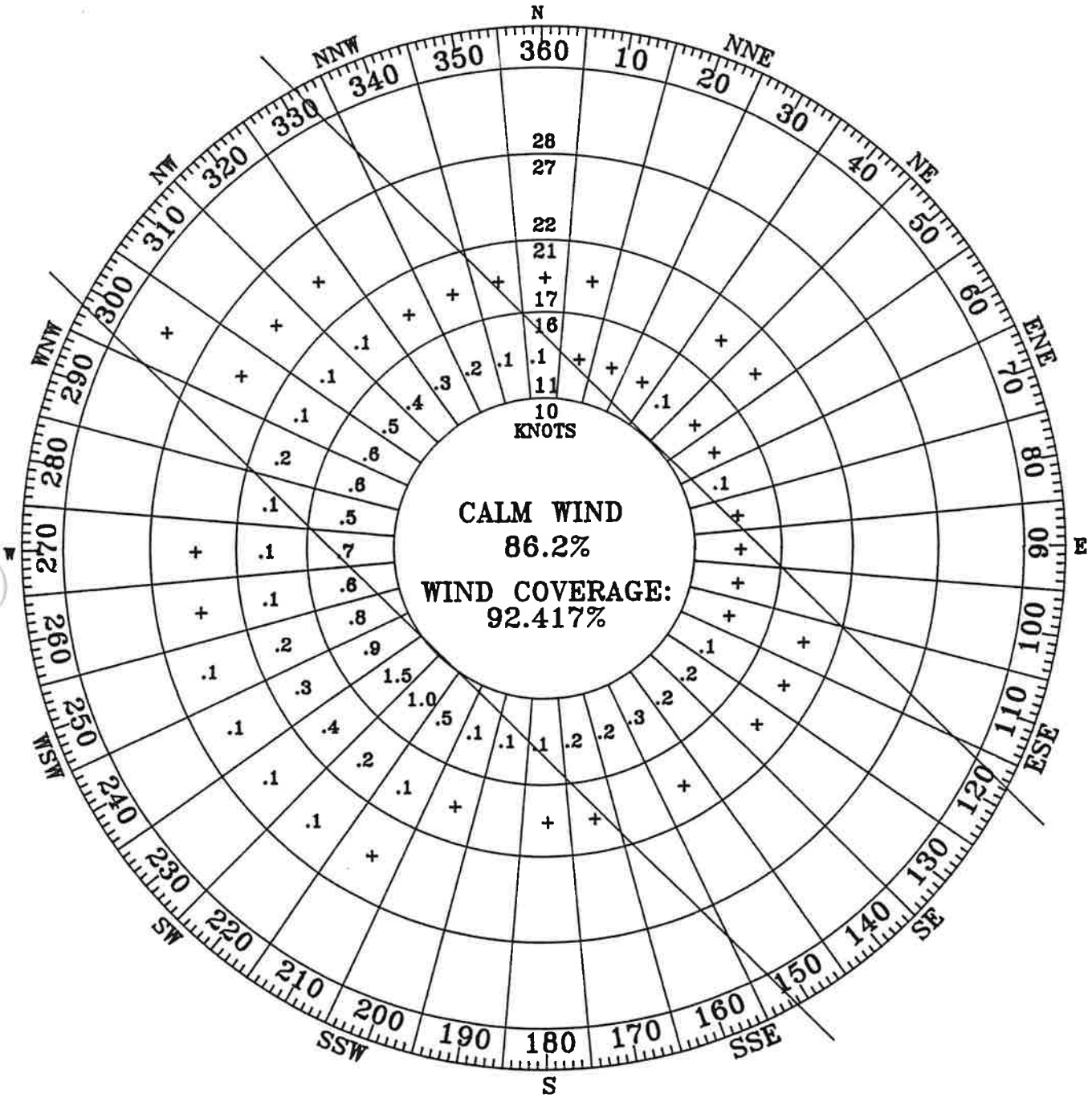
Although the combination of Runways 12-30 and 3-21 yielded similar results to the 1965-1969 wind analysis, the individual runways yielded a lower wind coverage. Runway 12-30, with a 13 knot crosswind, still meets the FAA recommended 95 percent minimum wind coverage for air carrier aircraft. Although this air carrier runway meets the minimum requirements, the development of Runway 3-21 will be reviewed in further detail in Chapter 4, Facility Requirements, to determine if the expansion of Runway 3-21 would provide increased safety to commercial commuter aircraft serving the airport.

The following five (5) figures represent the wind roses developed in this study.

TABLE 1-10
ALL WEATHER WIND ROSE COMPARISON
GALLATIN FIELD

RUNWAY OR COMBINATION	VELOCITY KNOTS	PERCENT COVERAGE 1965- 1969	PERCENT COVERAGE 1988-1991
12-30	10.5	96.28	92.417
12-30	13.0	97.98	95.230
3-21	10.5	96.30	94.851
12-30 & 3-21	10.5	98.52	99.492
12-30 & 3-21	13.0 (12-30) 10.5 (3-21)	99.63	99.795

GALLATIN FIELD AIRPORT
ALL WEATHER WIND ROSE
RUNWAY 12-30 10.5 KNOTS

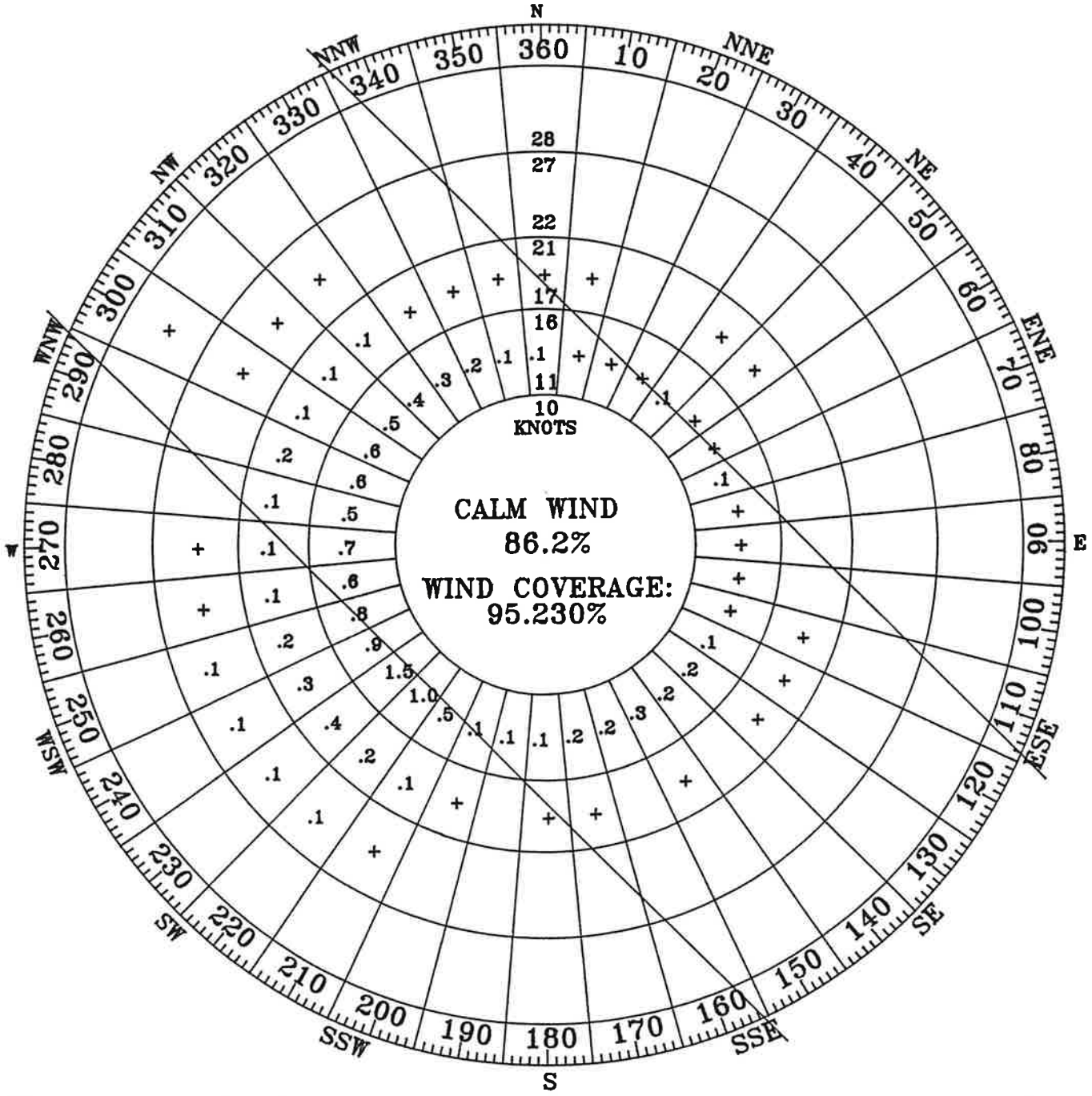


Observation Period
October, 1989 - March, 1991

Magnetic Declination
15 37'E.

Fig. 1-7

GALLATIN FIELD AIRPORT
ALL WEATHER WIND ROSE
RUNWAY 12-30 13.0 KNOTS

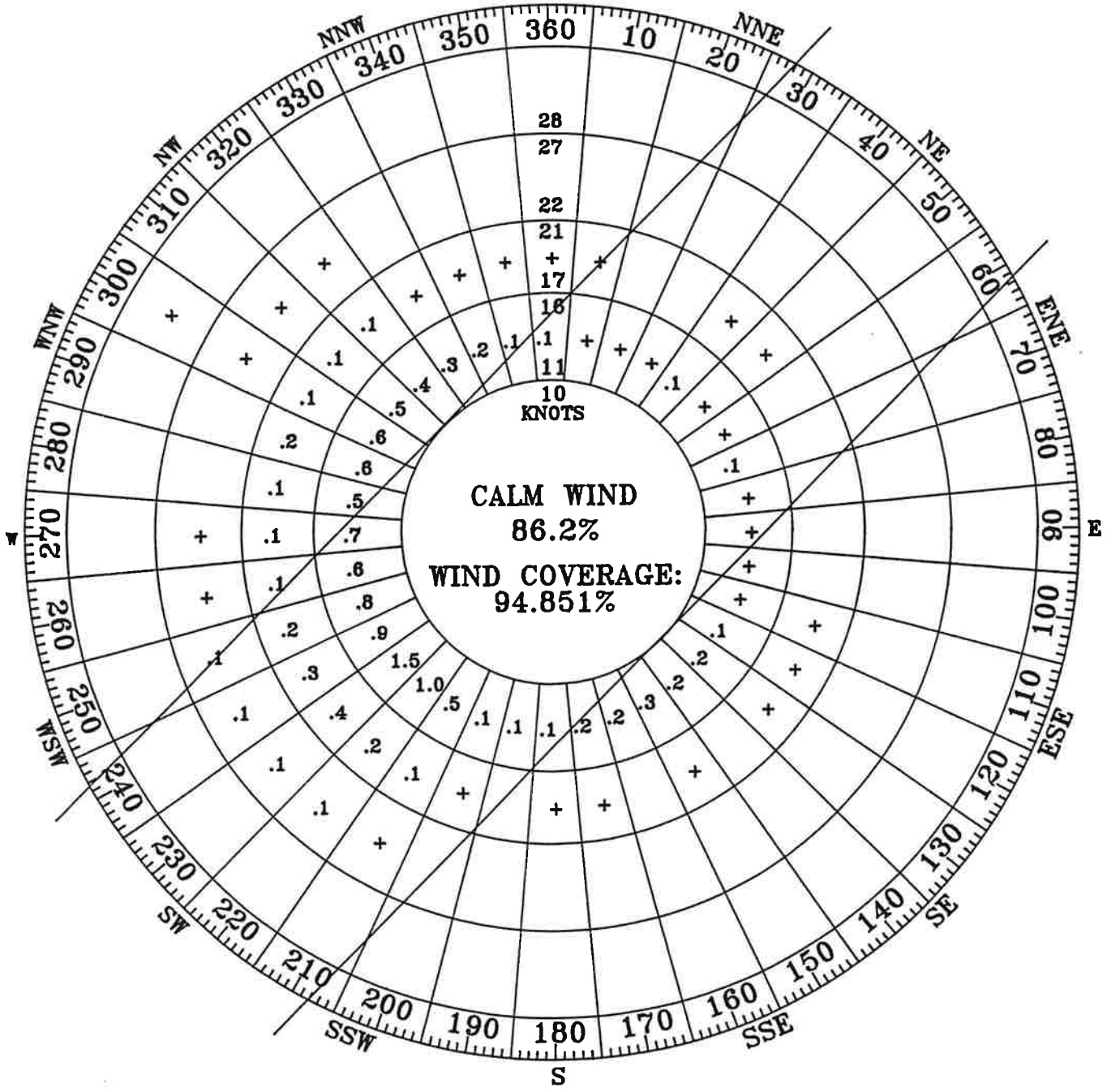


Observation Period
October, 1989 - March, 1991

Magnetic Declination
15 37'E.

Fig. 1-8

GALLATIN FIELD AIRPORT
ALL WEATHER WIND ROSE
RUNWAY 03-21 10.5 KNOTS

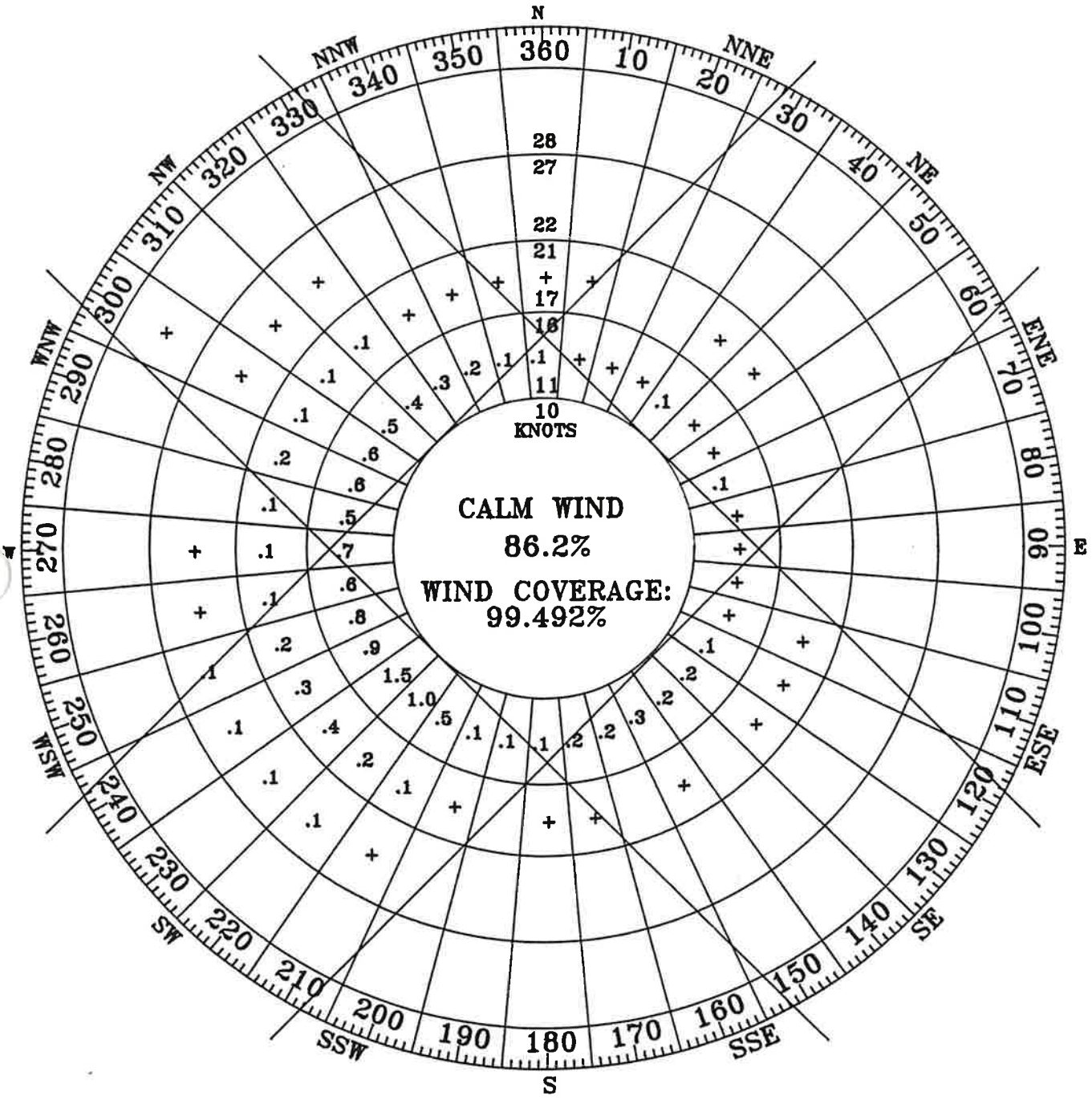


Observation Period
October, 1989 - March, 1991

Magnetic Declination
15 37'E.

Fig. 1-9

GALLATIN FIELD AIRPORT
ALL WEATHER WIND ROSE
RUNWAY 12-30 10.5 KNOTS
RUNWAY 03-21 10.5 KNOTS

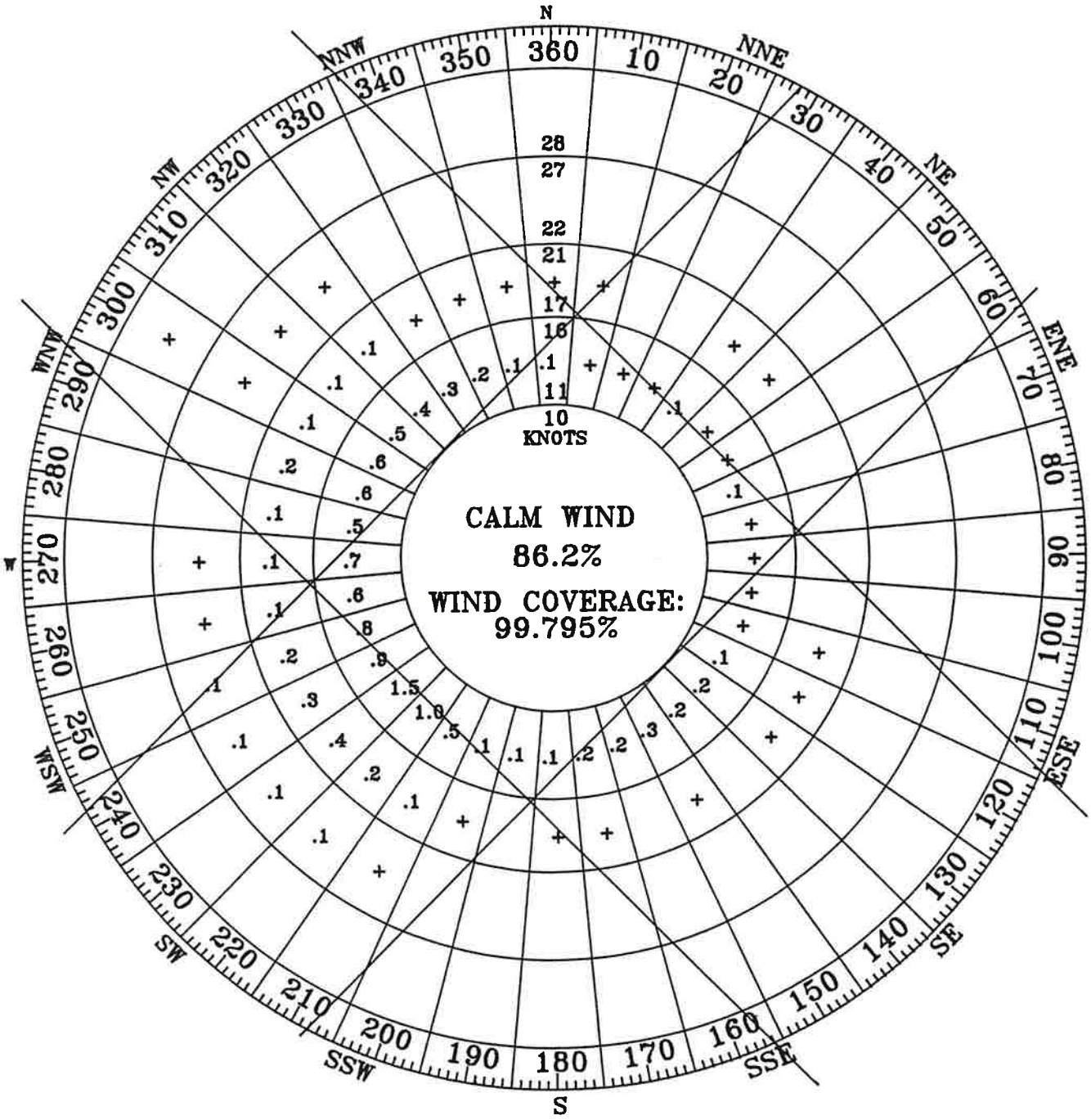


Observation Period
October, 1989 - March, 1991

Magnetic Declination
15 37'E.

Fig. 1-10

GALLATIN FIELD AIRPORT
ALL WEATHER WIND ROSE
RUNWAY 12-30 13.0 KNOTS
RUNWAY 03-21 10.5 KNOTS



Observation Period
October, 1989 - March, 1991

Magnetic Declination
15 37'E.

Fig. 1-11

GALLATIN FIELD AIRPORT
MASTER PLAN UPDATE/TERMINAL FEASIBILITY STUDY

CHAPTER 2 - FORECASTING

I. INTRODUCTION

This chapter looks at forecasts of aviation demand for Gallatin Field Airport through the year 2010. Projections for growth in population, industry, and travel will be made as a guide to the necessity and timing of new or expanded facilities of the airport. A number of socioeconomic factors influence planning for future needs. This chapter examines population, employment by trade, income, taxes and major industries for the past five to ten years as a means to extrapolating into the future of the airport. For the purposes of this report the trade area of Gallatin Field Airport is Gallatin County and the five surrounding counties: Broadwater, Jefferson, Madison, Meagher and Park (see Figure 1-6, Chapter 1).

II. POPULATION

The decade 1970-1980 saw rapid growth (13.3%) in the entire State of Montana and particularly for three counties in the trade area: Broadwater (29.3%), Gallatin (31.9%) and Jefferson (34.2%). In the following decade economic conditions turned down in Montana, and there was much slower growth. However, Gallatin County still grew at a 17.7% rate to finish 1990 with 50,463 people. The growth far outstripped the 1.6% growth rate in Montana's entire population for 1980-1990. (See Table 2-1).

TABLE 2-1
TRADE AREA POPULATIONS

ITEM	LAND AREA SQ. MI.	PRELIM. 1970 CENSUS	POPULATION 1980	POPULATION 1990	% CHANGE 1970-1980	% CHANGE 1980-1990
MONTANA	145,392	694,409	786,690	799,065	13.3	1.6
BROADWATER	1,188	2,526	3,267	3,318	29.3	1.6
GALLATIN	2,510	32,505	42,865	50,463	31.9	17.7
JEFFERSON	1,656	5,238	7,029	7,939	34.2	13.0
MADISON	3,590	5,014	5,448	5,989	8.7	9.9
MEAGHER	2,392	2,122	2,154	1,819	1.5	-15.6
PARK	2,910	11,261	12,935	14,562	14.9	12.6

Sources: 1. 1990 Preliminary Census of Population and Housing, Public Law 94-171 File.
2. U.S. Bureau of Census, Census Population: 1980, V.1, PC80-1-AZ8 Numbers of Inhabitants, Mont.

TABLE 2-1A
POPULATION (1990) OF MAJOR TOWNS

COUNTY/TOWN	POPULATION	HOUSING UNITS
BROADWATER	3,318	1,593
Townsend	1,635	749
GALLATIN	50,463	21,350
Belgrade	3,411	1,290
Bozeman	22,660	9,117
Manhattan	1,034	417
Three Forks	1,203	549
West Yellowstone	913	675
JEFFERSON	7,939	3,302
Boulder	1,316	521
Whitehall	1,067	502
MADISON	5,989	3,902
Ennis	773	395
Sheridan	652	344
Twin Bridges	374	232
Virginia City	142	124
MEAGHER	1,819	1,259
White Sulphur Springs	963	512
PARK	14,562	6,926
Clyde Park	282	130
Livingston	6,701	3,137

Source: 1990 Preliminary Census of Population and Housing, Public Law 94-171 File.

In 1988 the U.S. Bureau of Census made population projections for the State of Montana for each 5 year period from 1990 to 2010. For the twenty year period the census forecast a decrease in population of 0.6% or 0.03% per year. Both the National Planning Association and Woods & Poole Economics, Inc. projected state and county populations for the same twenty-year period.

Using the census for the 1990 population, the National Planning Association forecasts a State of Montana growth at 0.71.% per year, the trade area at an average of 0.8% per year and Gallatin County at 1.16% per year.

Woods and Poole project a State of Montana growth at 0.50% per year, the trade area at an average of 1.2% per year and Gallatin County at 1.17% per year. (See Table 2-2).

Both historical data for the last 10 years and population projections indicate that while the State may continue growing slowly, Gallatin County and the neighboring counties will be growing at a much faster rate.

TABLE 2-2
POPULATION PROJECTIONS: 1990-2010
CURRENT CENSUS

	1990	1995	2000	2005	2010	1990-2010	1990-2010
MONTANA (U.S. Bureau of Census)	799,065 (805,000)	798,000	794,000	792,000	794,000	-0.6	-0.3
MONTANA (National Planning Assoc.)	799,065 (814,570)	840,430	865,800	890,270	913,090	14.3	0.71
Broadwater	3,318 (3,790)	3,990	4,160	4,310	4,460	34.4	1.72
Gallatin	50,463 (50,540)	54,140	57,220	59,880	62,200	23.3	1.16
Jefferson	7,939 (8,500)	8,950	9,340	9,680	9,990	25.8	1.29
Madison	5,989 (5,690)	5,790	5,910	6,030	6,140	2.5	0.13
Meagher	1,819 (2,060)	2,060	2,080	2,110	2,140	17.7	0.88
Park	14,562	12,580	12,850	13,160	13,450	-7.6	-0.38
MONTANA (Woods & Poole)	799,065 (827,087)	841,169	852,487	863,883	879,122	10.0	0.50
Broadwater	3,318 (3,613)	3,821	4,025	4,242	4,481	35.0	1.75
Gallatin	50,463 (50,162)	54,579	57,744	60,177	62,277	23.4	1.17
Jefferson	7,939 (8,579)	9,440	10,415	11,519	12,799	61.2	3.06
Madison	5,989 (5,785)	5,934	6,085	6,255	6,477	8.2	0.41
Meagher	1,819 (2,200)	2,208	2,214	2,219	2,226	22.4	1.12
Park	14,562	13,318	13,318	13,487	13,604	-6.6	-0.33

Sources: U.S. Bureau of Census, National Planning Association and Woods and Pole Economics (1989 Projection)

III. EMPLOYMENT

The rapid population growth of 1970-1980 was accompanied by an increase in the labor force of 36.1% for the State of Montana, 50.0% for the trade area and 59.8% for Gallatin County. The number of employed people in the six county trade area increased from 20,956 to 32,085 between 1970 and 1980; the unemployment rate was 5.4% and 6.7% (compared to 6.0% and 8.1% for the State).

From 1980 to 1987 the work force increased 25.3%; in Gallatin County 26.8%. Employed people in the six-county area increased from 32,085 to 40,487 (See Table 2-3); the unemployment rate was 6.7% in 1980 and 6.2% in 1987 (compared to 8.1% and 7.4%

for the State of Montana). Based on the projected population increase of about 1% per year, the trade area will most likely experience a slow, steady increase in employment.

TABLE 2-3
EMPLOYMENT STATISTICS

LOCATION/YEAR	LABOR FORCE	EMPLOYED	UNEMPLOYED	UNEMPLOYMENT RATE
U.S.				
1970				--
1980				7.1
1987				6.2
MONTANA				
1970	266,395	244,608	16,041	6.0
1980	362,656	328,316	29,530	8.1
1987	403,000	373,000	30,000	7.4
BROADWATER				
1970	920	887	33	3.6
1980	1,415	1,270	145	10.2
1987	1,528	1,382	146	9.6
GALLATIN				
1970	12,877	12,129	699	5.4
1980	20,581	19,132	1,418	6.9
1987	26,096	24,613	1,483	5.7
JEFFERSON				
1970	1,768	1,688	80	4.5
1980	3,081	2,898	183	5.9
1987	5,424	5,170	254	4.7
MADISON				
1970	2,017	1,189	114	5.7
1980	2,537	2,451	86	3.4
1987	3,208	3,001	207	6.5
MEAGHER				
1970	862	804	58	6.7
1980	1,013	955	58	5.7
1987	1,075	985	90	8.4
PARK				
1970	4,512	4,259	253	5.6
1980	5,811	5,379	432	7.4
1987	5,835	5,336	499	8.6
TRADE AREA				
1970	22,956	20,956	1,237	5.4
1980	34,438	32,085	2,322	6.7
1987	43,166	40,487	2,679	6.2

SOURCE: 1) U.S. Bureau of Census, Census of Population: 1970 and 1980 2.) Montana Department of Labor and Industry, Research and Analysis Bureau, Montana Employment and Labor Force. 3) U.S. Department of Labor, Bureau of Labor Statistics. Employment and earnings (monthly)

The primary industries in this area by employment type are: government, services, retail trade, farming, and transportation. Farming is the most significant industry in Broadwater, Madison and Meagher Counties. In Park County the transportation industry has been a large employer because of the Burlington Northern locomotive - repair operations. The BN operations were terminated in 1986, but Livingston Rebuild Center (LRC) reopened the shop in July of 1988. LRC currently employs 100 people.

IV. ECONOMIC FACTORS IN GALLATIN COUNTY

According to Table 2-4, the major industries in Gallatin County, as defined by annual average employment are:

1. government including federal, civilian, military, state and local;

2. services such as hotels, lodging, personal services, business services, auto repair, amusement and recreation, health, legal and social services;

3. retail trade such as building materials and garden supplies, general merchandise, food stores, auto dealers, furniture stores, eating and drinking, miscellaneous retail.

4. Manufacturing and farming follows these in significance.

Government employees in Gallatin County numbered 4,413 in 1983 and 4,393 in 1987, with total wages of $78.7 million and $88.0 million, an increase of 11.5%. Bozeman is the home of Montana State University and currently employs 2000. The administrative office of the Gallatin National Forest is located in Bozeman and has 150 permanent employees, along with about 100 temporary staff. Other employers with more than 100 employees are the City of Bozeman, Gallatin County, the Soil Conservation Service and the Belgrade and Bozeman School Districts.

The service industry had 3,192 employees in 1983 and 3,642 (14.1%) in 1987. Wages increased from $34.8 million to $47.3 million (36.0% increase) respectively. The tourism industry is rapidly expanding in the trade area and particularly in Gallatin County where attractions include Yellowstone National Park, two downhill ski areas, snowmobiling, fishing, hunting, hiking and numerous golf courses. Because of the increasing number of people who wish to retire or have second homes in the county, there are economic spinoffs to all home-related services and products. Employers in this industry with over 100 employees are Big Sky of Montana, Inc. and Bozeman Deaconess Foundation (hospital).

TABLE 2-4
TRADE AREA EMPLOYMENT BY INDUSTRY

	BROADWATER		GALLATIN		JEFFERSON		MADISON		MEAGHER		PARK	
	1981	1986	1981	1986	1981	1986	1981	1986	1981	1986	1981	1986
TOTAL ALL INDUSTRIES	1,474	1,546	2,231	16,180	2,356	3,401	3,005	2,775	959	1,021	6,143	6,341
FARM	344	330	1,154	1,157	335	348	826	811	265	252	561	565
AGRICULTURAL FORESTRY, FISHING	14	13	208	313	26	34	61	---	44	52	70	102
MINING	10	38	81	158	91	179	200	---	11	---	17	91
GENERAL CONSTRUCTION	87	84	1,271	1,681	115	174	165	213	42	47	303	273
MANUFACTURING	113	141	1,424	1,304	31	121	38	40	106	37	366	332
TRANSPORTATION COMMUN. AND PUBLIC UTILITIES	29	56	854	1.037	63	102	92	118	---	34	1,288	931
WHOLESALE TRADE	111	72	620	888	18	20	61	31	L	L	54	87
RETAIL TRADE	256	259	4,685	5,538	287	431	387	377	153	174	1,103	1,033
FINANCE, INSURANCE REAL ESTATE	57	86	1,449	1,643	115	173	156	161	---	---	348	383
SERVICES	193	240	4,592	6,333	468	583	373	485	144	225	1,346	1,827
GOVERNMENT (FEDERAL, STATE, LOCAL MILITARY)	260	227	5,980	6,128	807	876	441	467	144	156	687	717

L - Less than 10 jobs. Estimates are included in total

Sources: 1. U.S. Bureau of Census, Census of Population: 1980
2. U.S. Department of Commerce, Bureau of Economic Analysis Regional Economic Information System.

Retail trade is the third largest industry in annual wages paid. In 1983 there were 3,940 employees and in 1987 4,328 (+9.8%). Wages increased from $33.6 million to $39.8 million (+18.7% increase) respectively. Residential building permits in Bozeman reached a high in 1983-84 and dropped off rapidly toward the end of the decade. In 1991 and 1992 the building industry has rebounded in Gallatin County, accompanied by much higher sales volumes in building supply stores. Employers with over 100 employees are K Mart Corp. and McDonald's of Bozeman.

Gallatin County has two additional major employers: Louisiana Pacific, Inc. (forest products) and the Montana Power Company.

In summary, the industry which has shown the greatest increase in both annual average employment and annual wages is the service industry. Governmental employment should be stable in part because Montana State University's enrollment is consistently around 10,000 students. Retail trade is growing 5-6% per year and should benefit from increasing population, employment and income. Almost all sectors of the economy in the trade area are growing. Personal income, per capita, increases at an average rate of 5.1% (see Table 2-5) and property taxable valuations increase at an average rate of 1.1%. (see Table 2-6).

TABLE 2-5
PER CAPITA PERSONAL INCOME*

	1981	1982	1983	1984	1985	1986	AVERAGE
STATE OF MONTANA							
(percent of national average)	90.2	87.8	86.1	82.6	79.4	80.8	84.5
BROADWATER	8,117	7,809	8,264	8,478	8,301	10,484	
(percent of change)	--	-3.8	5.8	2.6	-2.1	26.3	5.8
(percent of national average)	73.8	68.0	68.3	64.6	59.7	71.6	67.7
GALLATIN	8,913	9,301	9,999	10,645	10,941	11,336	
(percent of change)	---	4.4	7.5	6.5	2.8	3.6	5.0
(percent of national average)	81.4	81.0	82.6	81.2	78.7	77.4	80.4
JEFFERSON	9,671	10,334	10,749	11,150	11,716	12,412	
(percent of change)	---	6.9	4.0	3.7	5.1	5.9	5.1
(percent of national average)	88.3	90.0	88.8	85.0	84.2	84.8	
MADISON	8,683	8,127	8,367	8,999	9,655	11,054	
(percent of change)	---	-6.4	3.0	7.6	7.3	14.5	5.2
(percent of national average)	79.3	70.8	69.1	68.6	69.4	75.5	72.1
MEAGHER	9,006	8,801	8,551	8,622	8,343	10,933	
(percent of change)	---	-2.3	-2.8	-0.8	-3.2	31.0	4.7
(percent of national average)	82.3	76.7	70.7	65.7	60.0	74.7	71.7
PARK	9,565	9,917	10,166	10,915	11,296	12,161	
(percent of change)	---	3.7	2.5	7.4	3.5	7.7	5.0
(percent of national average)	87.4	86.4	84.0	83.2	81.2	83.1	84.2

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System.

TABLE 2-6
PROPERTY TAX BASE
TOTAL TAXABLE VALUE (dollars)

	1985	1986	1987	1988	AVERAGE
MONTANA (X100)	2,370,133	2,306,287	2,000,745	1,942,950	
(percent changed)	---	-2.7	-13.2	-2.9	-6.3
BROADWATER	11,369,683	11,379,750	11,326,294	11,105,540	
(percent changed)	---	0.1	-0.5	-2.0	-0.9
GALLATIN	62,531,599	66,636,339	66,819,801	65,718,541	
(percent changed)	---	6.6	0.3	-1.6	1.8
JEFFERSON	17,395,169	17,577,928	19,961,290	20,422,174	
(percent changed)	---	-1.0	13.6	2.3	5.6
MADISON	17,806,981	16,754,704	17,765,597	16,921,768	
(percent changed)	---	-5.9	6.0	-4.8	-1.6
MEAGHER					
(percent changed)	8,108,625	7,825,647	8,206,466	7,973,271	
	---	-3.5	4.9	-2.8	-0.5
PARK	18,929,185	20,465,935	20,236,075	20,165,026	
(percent changed)	---	8.1	-1.1	-0.4	2.2

Source: **Montana Department of Revenue, Biennial Reports**

V. AIRPORT ENPLANEMENTS AND OPERATIONS HISTORY AND FORECAST

The forecasts in this report are primarily based on historic information obtained from the FAA District Office, Bozeman Flight Service Station, Montana Aeronautics Division, local FBO's and Gallatin Field Airport management. National trends forecast in the FAA's publication "National Plan of Integrated Airport Systems (NPIAS) and the Terminal Area Forecasts (TAF) were generally applied to current activity levels to forecast passenger enplanements and aircraft operations. The annual enplanements at Gallatin Field have increased at approximately 10% per year for the past 20 years. This plan estimates a continual growth of passengers boarding airplanes at approximately 6,000 to 7,000 annually.

The forecasting efforts of this study considered many background factors. The Bozeman area has several special characteristics that influence projections. The sharp increase in the economic development of Gallatin County, and Bozeman in particular, is the result of combining these important factors.

The economic indicators point to a recent history of rapid development and a healthy indication of more of the same in the future. High-Tech light industrial activity is on the increase, and indicators show a continuance of that trend throughout the study. Much of the economic activity in the past has been centered around Montana State University. This will continue to be the case, however, to a relatively lesser extent since the size of the university has stabilized to a uniform enrollment. The business community outside the university is growing more rapidly than the educational institution and its associated elements.

Another important factor is the increased recreational activity in the area. Gallatin Field serves the rapidly expanding leisure market in the heart of a major vacation area of the Rocky Mountain West. These major vacation attractions include a great deal of outdoor recreation opportunities related to both summer and winter activities.

Gallatin Field is only 90 miles from one of the major gates to Yellowstone National Park and as such, serves as a gateway to many outdoor activities in the three major river and mountain drainage areas of the Gallatin, Madison, and Jefferson Rivers which flow together in Gallatin County near Gallatin Field to form the Missouri River. Fishing, hunting, camping, and many forms of associated activities are attracting increasing numbers of people to the area.

Increased recreational activity is also associated with the winter activities of Big Sky and Bridger Bowl Ski areas.

In summary, the environment of rapid growth and increased economic activity, coupled with the rapidly expanding recreational industry in the trade area allows for strong growth in aviation activities of all kinds at Gallatin Field.

Historic Enplanement Data

Since the 1972 Gallatin Field Airport Master Plan was prepared, the enplanements (boardings) at the Gallatin Field Airport have increased significantly. The total boardings, shown in Table 2-7, have increased from 22,944 in 1972 to 153,812 in 1992. The percent change per year has ranged from a -15.8% to +49.1% with an overall average of +10.05% per year increase. The airport appears to have another record breaking year with boardings up in 1993.

The 1972 Master Plan directed much of its forecasting efforts to the impacts that the Big Sky Ski area would have on traffic at Gallatin Field. The plan divided the annual forecasts into two traffic categories, base traffic and traffic generated directly from the Big Sky development. The 1972 plan forecast that by 1980, approximately 60% of the passengers would be going to the Big Sky Resort and the remaining 40% would be Gallatin Field base traffic. This report estimated the total enplanements to begin at 26,915 in 1971 and reach an estimated 358,605 passenger boardings at Gallatin Field in 1990. However, the 1972 boarding projections were never reached and the significance of Big Sky was over estimated.

In October 1978, the "Airline Deregulation Act of 1978" was enacted. This act was intended to encourage, develop, and attain an air transportation system based on competitive markets. Although its effect on sparsely populated areas is typically a decline in passenger enplanements, Gallatin Field has maintained an upward growth. Gallatin Field has convenient connecting flights which have been supplemented by additional commuter flights since 1978.

Table 2-7 depicts the Historic Airline Enplanements for scheduled air carrier, commuter and charter service between 1983 and 1992 as recorded by the Gallatin Airport Authority. Figure 2-2 graphically depicts the recent Historic Airline Enplanements.

Figure 2-1 shows the historic enplanements from 1972 to 1990, as well as the base traffic and base traffic plus Big Sky estimated by TAP in the 1972 Master Plan.

TABLE 2-7
HISTORIC ENPLANEMENTS
1972-1992

YEAR	BOARDINGS	PERCENT CHANGE	YEAR	BOARDINGS	PERCENT CHANGE
1972	22.994	-4.7	1984	73,680	+1.8
1973	34,200	+49.1	1985	80,735	+9.6
1974	40,322	+17.9	1986	105,197	+30.3
1975	43,687	+8.3	1987	119,295	+13.4
1976	51,321	+17.5	1988	117,569	-1.4
1977	60,833	+18.5	1989	118,503	+.8
1978	56,493	-7.1	1990	128,675	+8.6
1979	69,177	+22.5	1991	141,898	+10.3
1980	70,253	+1.6	1992	153,812	+8.4
1981	59,186	-15.8			
1982	61,103	+3.2			
1983	72,395	+18.4			

Source: Gallatin Airport Authority Files

Gallatin Field Airport

Master Plan Update/

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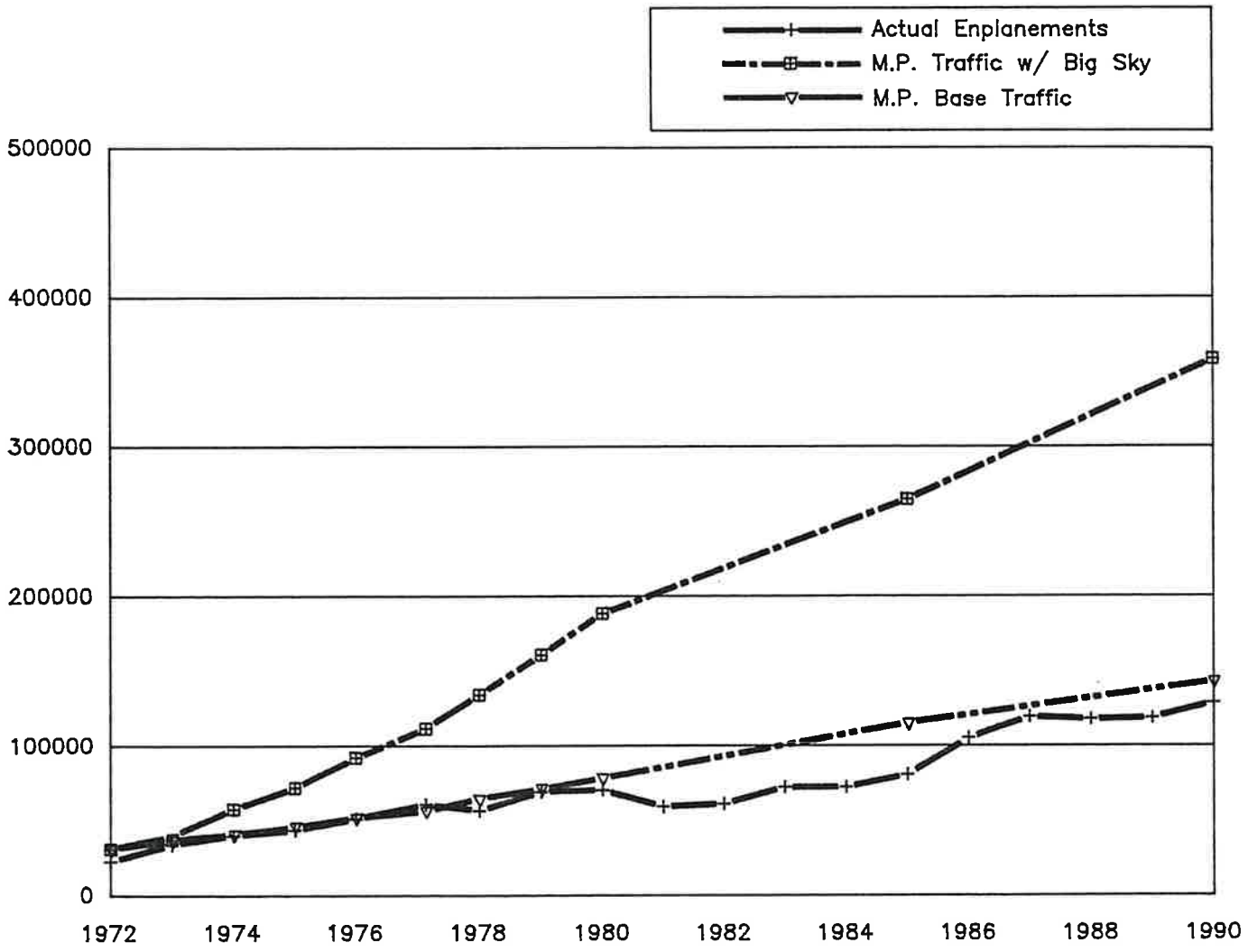


Historic Enplanements
Actual & 1972 Master Plan

Figure 2-1

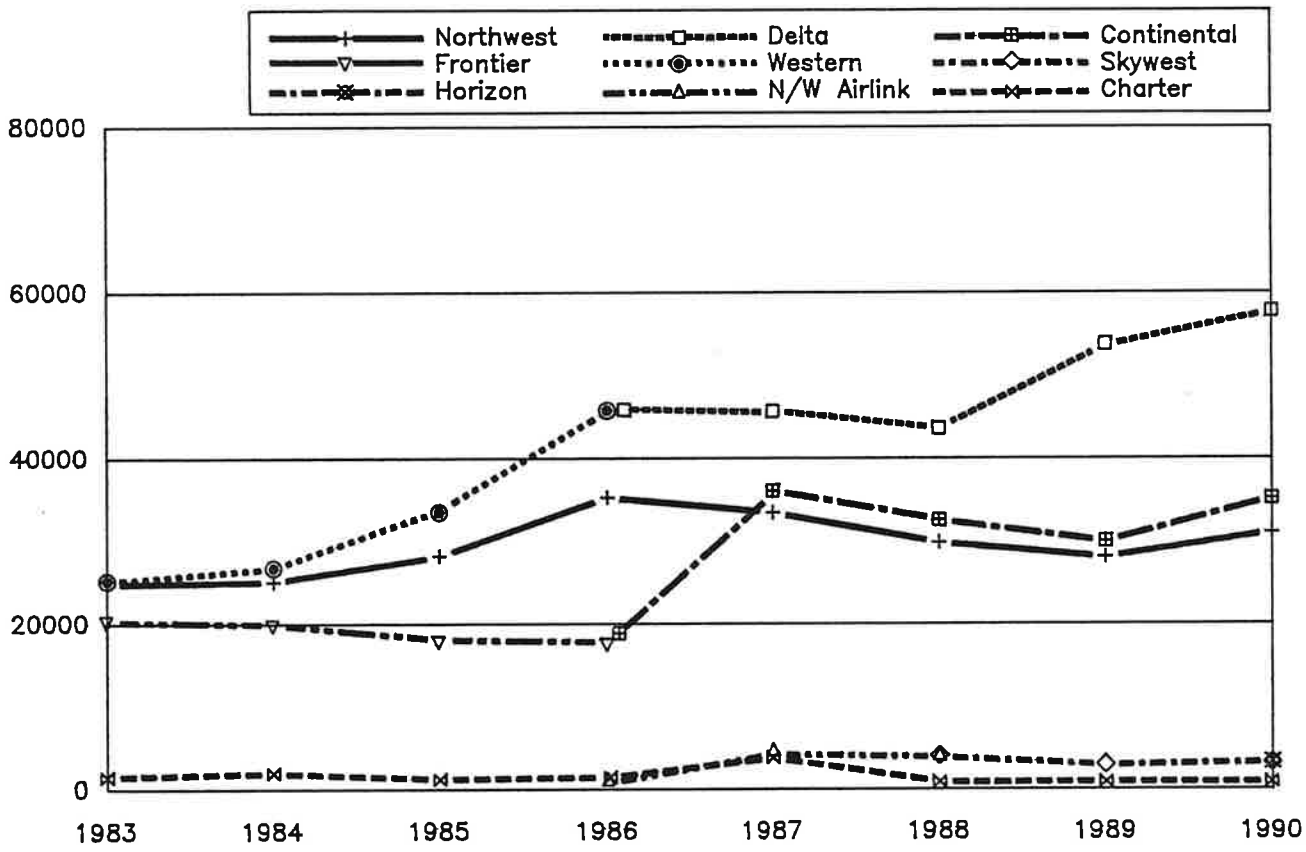
Morrison Maierle/CSSA

Total air carrier, commuter and charter enplanements have increased by approximately 112.4% from 1983 to the 1992 level of 153,812. With the exception of 1988, Gallatin Field enplanements have increased every year with an overall average increase of 10.0% per year. This trend continued in 1991 and 1992, with annual increases of 10.3% and 8.4% respectively. This data, compiled monthly is the most accurate source of historic enplanement data at the airport. Table 2-8 and Figure 2-2 depicts the Historic Airline Enplanements by carrier for 1983-1990.

TABLE 2-8
HISTORIC AIRLINE ENPLANEMENTS BY CARRIER
(1983-1990)

AIR CARRIERS	1983	1984	1985	1986	1987	1988	1989	1990
NORTHWEST	25,220	25,059	28,157	35,272	33,400	29,810	28,025	31,032
DELTA					45,594	43,468	53,633	57,664
CONTINENTAL				3,201	36,055	32,520	29,954	32,562
FRONTIER	20,438	19,887	17,903	17,610				
WESTERN	25,221	26,777	33,455	45,796				
AIR CARRIER SUBTOTAL	70,879	71,723	79,515	102,879	114,950	105,789	111,612	121,258
SUBTOTAL COMMUTERS								
SKYWEST						3,979	2,832	3,226
HORIZON								3,322
N/W AIRLINK					904	4,483	4,040	3,353
CHARTER	1,516	1,948	1,220	1,414	862	3,770	706	869
COMMUTERS SUBTOTAL	1,516	1,948	1,220	2,318	5,345	11,789	6,891	7,417
TOTAL	72,395	73,671	80,735	105,197	120,295	117,587	118,503	128,675

Source: Gallatin Airport Authority Files



Historic Enplanements
Air Carrier and Commuter

Figure 2-2

Historic Operations Data

According to the Gallatin Airport Authority Files, total operations (landings and departures) at Gallatin Field Airport have increased approximately 3.8% from 29,154 operations in 1983 to the 1990 level of 30,264. Commuter operations starting in 1986 reached a peak in 1988 of 5,652 operations and have since stabilized in 1990 at 3,706 operations. General aviation has seen a decline of approximately 17.8 percent from 22,552 operations in 1983 to an estimated 18,540 operations in 1990. This is according to estimates made by Airport Management. Air carrier operations have seen a steady increase of approximately 21.5% from 6,602 operations in 1983 to 8,018 in 1990.

Gallatin Field Airport has benefited from constant air carrier service over the past years. Northwest, Frontier, and Western all served the airport in 1983 with Northwest, Delta, and Continental currently serving the airport. Commuter service has been offered by Northwest Airlink, as well as the current carriers of Skywest and Horizon Airlines.

Table 2-9 shows the Historic Aircraft operations for scheduled air carrier and commuter service, as well as General Aviation Traffic as recorded by the Gallatin Airport Authority for the years 1983 to 1990.

TABLE 2-9
HISTORIC OPERATIONS (1983-1990)

	1983	1984	1985	1986	1987	1988	1989	1990
AIR CARRIERS	6,602	6,604	6,988	7,290	8,308	7,254	7,598	8,018
COMMUTERS				790	3,444	5,652	3,928	3.706
GENERAL AVIATION	22,552	23,984	23,360	18,022	18,908	16,600	18,216	18,540
TOTAL OPERATIONS	29,154	30,580	30,348	26,102	30,660	29,506	29,742	30,264

SOURCE: Gallatin Field Files

* General Aviation Operations are Estimated

Gallatin Field Airport

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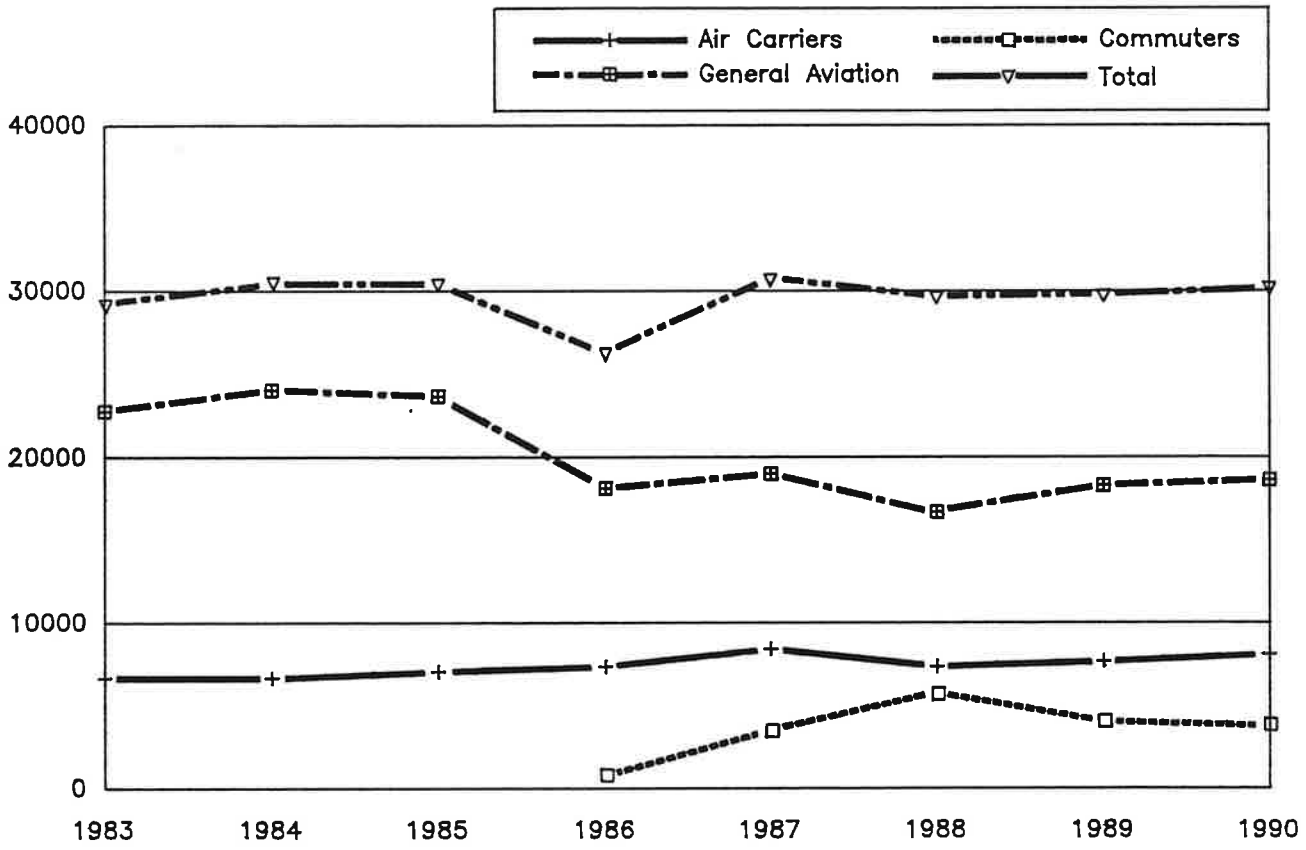

Historic Operations
Commercial & General Aviation

Figure 2-3

Morrison Maierle/CSSA

Historic operations data for the years 1983 through 1989 from the TAF (FY 1989-2005) are shown in Table 2-10. Operations data varies significantly from the operations data on file with Airport Management. The data compiled from the Gallatin Airport Authority with the exception of General Aviation Traffic is felt to better depict the operational trends at the airport because of continuous record keeping.

TABLE 2-10
HISTORIC OPERATIONS TAF
(1983-1989)

	1983	1984	1985	1986	1987	1988	1989
AIR CARRIER	7,000	7,000	4,000	6,000	6,000	9,000	6,000
COMMUTER/AIR-TAXI			6,000	5,000	15,000	11,000	3,000
SUBTOTAL	7,000	7,000	10,000	11,000	21,000	20,000	9,000
G.A. (ITINERANT)	6,000	7,000	7,000	10,000	5,000	7,000	5,000
(LOCAL)	23,000	24,000	24,000	6,000	19,000	24,000	19,000
SUBTOTAL	29,000	31,000	31,000	16,000	24,000	31,000	24,000
MILITARY	0	0	0	0	0	0	0
TOTAL OPERATIONS	36,000	38,000	41,000	27,000	45,000	51,000	33,000

Flight Service Station (FSS Airport Advisories are shown)

Flight Service Station Airport Advisories are shown in Table 2-11 for the years 1983 through 1990.

An advisory is recorded each time a pilot requests specific information from the flight service station. FSS advisories may be below the total number of actual operations since all pilots do not contact the FSS. This information does, however, present an indication of the operational activity and serves as a basis for estimating aircraft operations, primarily general aviation.

Advisories have moderately increased from 30,442 in 1983 to 39,441 in 1990 (+29.6%). Although Flight Service Station Airport Advisories do not directly represent aircraft operation data, they do indicate areas of change.

FAA 5010 Airport Master Record forms were also reviewed and show activity levels comparable to the Terminal Area Forecasts. Since the levels are comparable, they are not tabulated in this report.

TABLE 2-11
FLIGHT SERVICE STATION AIRPORT ADVISORIES (1983-1990)

	1983	1984	1985	1986	1987	1988*	1989	1990
AIR CARRIER								
IFR	6,961	6,285	6,773	7,262	8,379	8,056	7,733	8,083
VFR	54	42	25	8	29	84	138	137
SUBTOTAL	7,015	6,327	6,798	7,270	8,408	8,140	7,871	8,220
AIR-TAXI COMMUTER								
IFR	98	121	272	424	3,000	3,835	4,669	3,542
VFR	135	333	1,021	1,788	2,789	2,949	3,110	2,228
SUBTOTAL	233	504	1,293	2,132	5,789	6,784	7,779	5,770
GENERAL								
IFR	2,085	2,539	2,144	1,749	1,557	1,681	1,805	2,059
VFR	20,662	20,231	19,571	18,910	18,875	18,856	18,836	2,280
SUBTOTAL	22,747	22,770	21,715	20,669	20,432	20,537	20,641	24,939
MILITARY								
IFR	283	221	177	133	136	241	345	241
VFR	164	298	320	342	265	312	359	241
SUBTOTAL	447	519	497	475	401	553	704	482
TOTAL CONTACTS	30,442	30,120	30,303	30,536	35,030	36,014	36,995	39,411

Source: FAA Flight Service Activity Surveys.

* Data unavailable estimated based on future and previous year.

Forecast Enplanements

Table 2-12 shows the forecast enplanements at Gallatin Field Airport as presented in the 1982 and 1988 Montana State Aviation System Plan update; Terminal Area Forecasts (TAF) FY 1987-2000; Terminal Area Forecasts (TAF) FY 1989-2005; and the National Plan of Integrated Airport Systems 1990-1999. With the exception of the TAF data for the State of Montana, each forecast pertained specifically to Gallatin Field Airport.

While the total growth for each forecast is comparable, the 1990 base year varies considerably, depending upon the historic data used.

TABLE 2-12
FORECAST ENPLANEMENTS
FROM PAST STUDIES

	1990	PERCENT CHANGE/1	1995	PERCENT CHANGE/1	2000	PERCENT CHANGE/1	2005	PERCENT CHANGE/1	2010
MSSPU 1988	130,000	9.2(1.9)	142,000	9.2(1.9)	155,000	15.5(3.1)	179,000	8.9(1.8)	195,000*
MSSPU 1982	100,000	25 (5.0)	125,000	20 (4.0)	150,000	16.7(3.3)	175,000	14.3(2.9)	200,000
TAF 1987-2000									
AIR CARRIER	106,000	22.6(4.5)	130,000	19.2(3.9)	155,000	16.1(3.2)	180,000	13.9(2.8)	205,000
COMMUTER	0	0 (0)	0	0 (0)	0	0 (0)	0		0
AIR-TAXI	0	0 (0)	0	0 (0)	0	0 (0)	0		0
TOTAL	**106,000**	**22.6(4.5)**	**130,000**	**19.2(3.9)**	**155,000**	**16.1(3.2)**	**180,000**	**13.9(3.8)**	**205,000**
TAF 1989-2005									
AIR CARRIER	119,000	22.7(4.5)	146,000	19.2(3.8)	174,000	15.5(3.1)	201,000	13.9(2.8)	229,000
COMMUTER	5,000	20.0(4.0)	6,000	33.3(6.7)	8,000	12.5(2.5)	9,000	22.2(4.5)	11,000
AIR-TAXI	0	0 (0)	0	0 (0)	0	0 (0)	0		
TOTAL	**124,000**	**22.6(4.5)**	**152,000**	**19.7(4.0)**	**182,000**	**15.4(3.1)**	**210,000**	**14.3(2.9)**	**240,000**
NPIAS	117,000	28.2(5.6)	150,000	24.0(4.8)	186,000	22.6(4.5)	228,000	18.4(3.7)	270,000
TAF STATE (X x 1000) FY 1987-2000	914	16.9(3.4)	1,068	15.9(3.2)	1,238	16.0(3.2)	1,436*	16.0(3.2)	1,666*

* INTERPOLATION OR RETRAPOLATION FROM DATA

1/ Percent Change - Average Per 5 Years and (Average Per 1 Year)

The study forecasts for the planning period 1990 through 2010 as shown in Table 2-14 were prepared in 1991 using actual enplanement data for 1990. The actual 1990 enplanements recorded by airport management were 122,127 for air carrier, 6548 for commuter and 869 for charters.

The determination of 1990 Air-Taxi enplanements from other than known charters required an analysis of the historic operations as shown in Tables 2-10 and 2-11. The Flight Service Station reported contacts with 5770 Air-Taxi/commuter aircraft in 1990. It was assumed that this number represented 100% of the Air-Taxi/commuter operation during 1990. The actual number of commuter operations recorded by airport management in 1990 was 3,706. The difference between the Air-Taxi/commuter contacts (5,770) and the actual commuter operations (3,706) recorded is 2,064, which were all considered Air-Taxi operations.

In 1987, a ramp survey was conducted on 13 airports in Montana as part of the Montana State Aviation System Plan Update. The ramp survey showed an average enplanement of 1.91 passengers per itinerant General Aviation Departure. The Aircraft Owners and Pilots Association (AOPA) projected a factor of 2.96 in 1985. For Air-Taxi and general aviation enplanement forecasts in this study, the value of 1.91 was considered reasonable.

Assuming 1.91 enplanements per departure, the general aviation enplanements for 1990 was estimated to be 4,775 (5,000/2 departures x 1.91 = 4,775). Also under the same assumption the 1990 Air-Taxi enplanements was estimated to be 2,000 (2,064/2 x 1.91 = 1,971). Therefore, the total enplanements for the base year of 1990 includes 4,775 general aviation, 2,000 Air-Taxi, 6,548 commuter, 869 charter and 122,127 air carrier for a total of 136,319.

For the purpose of the aviation forecasts presented in this report, the estimated 1990 commercial enplanements of 131,500 (total enplanements less G.A.) were used. The growth rates for each forecast in Table 2-12 were projected from the base year and shown in Table 2-13 and graphically in Figure 2-4.

The annual enplanements at Gallatin Field over the past 20 years grew at an average rate of 10.05% per year. During the past nine years, the average rate has been 10.0. Gallatin Field has demonstrated a greater than average growth rate over the past 20 years. Gallatin County has also demonstrated a greater than average population growth over the past 20 years. The TAF for the State of Montana forecasts an average enplanement growth rate of 4.2% per year.

Considering the recent economic growth in the Bozeman area, the potential for economic growth and the growth of recreation and local ski areas, it was determined that the total enplanements would continue to increase at a rate greater than the state average.

The average annual increase at Gallatin Field over the past twenty years as been 5,971 passengers per year. During the past nine years, the average annual increase has been 7,721 passengers per year. These figures were used to develop the high (7,721 passengers per year increase) and low (5,871 passengers per year) forecast passenger ranges shown in Table 2-13.

The adjusted TAF figures represent an average growth of approximately 6,600 enplanements per year. The projected increase in the adjusted TAF is on the low end of the Gallatin Field range. The TAF figures best estimate the future enplanements at Gallatin Field and will be used for developing facility requirements in this plan.

The forecast range of enplanements presented in Table 2-13 was completed in 1991. Gallatin Field actually recognized passenger enplanements of 141,898 in 1991 and 153,812 in 1992. These are substantially greater than the Gallatin Field high range of 7,721 passengers per year, but it is felt that over the twenty year planning period the enplanements forecast in this report are still justifiable.

TABLE 2-13
FORECAST COMMERCIAL ENPLANEMENTS

1990	1995	2000	2005	2010
MSSPU 1988	131,500	143,335	156,520	180,755	196,900
1988	131,500	143,335	156,520	180,755	196,900
MSSPU 1982	131,500	164,375	197,250	230,125	263,000
***TAF**	131,500	161,270	191,100	221,920	252,740
NPIAS	131,500	168,590	209,050	256,250	303,450
		GALLATIN FIELD MASTER PLAN FORECAST			
GALLATIN FIELD					
HIGH	131,500	170,105	208,710	247,315	285,920
LOW	131,500	160,855	190,210	219,565	248,920

* Adjusted TAF Forecast Enplanements will be used to develop facility requirements.

Gallatin Field Airport

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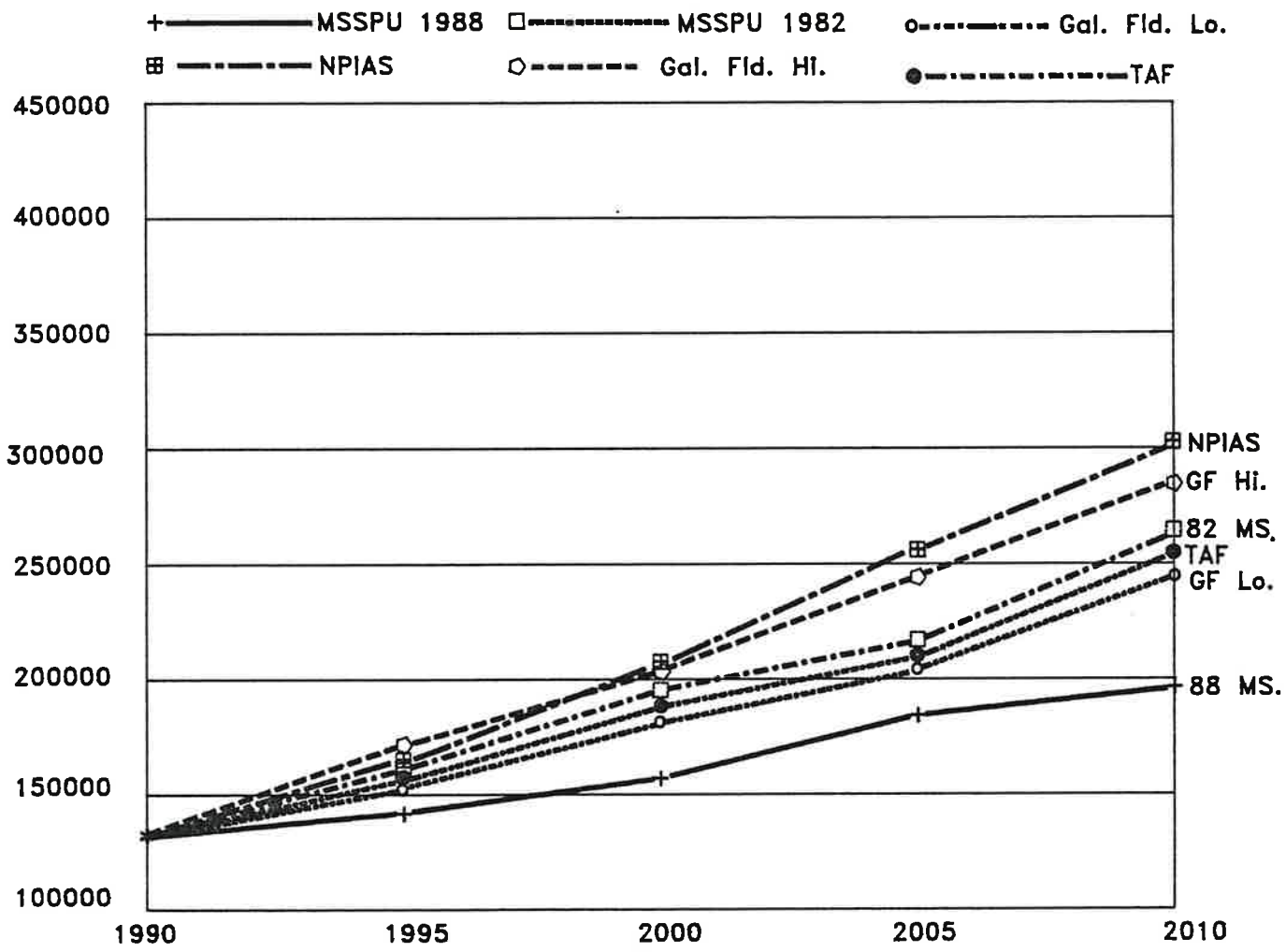

Forecast Enplanements
1993 Master Plan & Other Studies

Figure 2–4

Morrison/Maierle/CSSA

Forecast Operations

The operations forecasts for air carriers and commuters are based on the enplanement forecasts and the historical number of enplanements per departures from 1983 to 1990. The data presented in Table 2-14 shows the historic enplanements/departure for air carrier and commuter flights at Gallatin Field as recorded by Airport Management.

TABLE 2-14
ENPLANEMENTS/DEPARTURE (1983-1990)

	1983	1984	1985	1986	1987	1988	1989	1990
AIR CARRIERS								
AVERAGE ENPLANEMENT/DEPARTURE	21.9	22.3	23.1	28.6	27.6	30.2	29.6	30.5
COMMUTERS								
AVERAGE ENPLANEMENT/DEPARTURE	0	0	0	2.3	2.6	2.8	3.1	3.5

The average number of air carrier enplanements per departure from 1983 to 1990 is approximately 27. The 1990 value is 30.5, the low 21.9, and the high is 30.5. The average enplanements per departure which was increasing much the same as the total enplanements at Gallatin Field over the past nine years, leveled off. It was determined, therefore, that the higher limit (30.5) over the planning period would best forecast the number of air carrier operations to accommodate the forecast enplanements through the year 2010.

The commuters have carried approximately five percent (5.0%) of the total enplaned passengers since commuter service began at Gallatin Field in 1986. The higher number of enplanements/departure (3.5) was also used in developing commuter operations forecasts.

Air-Taxi service is expected to supply 1.5% of the total enplanements and will be expected to carry 1.91 passengers per departure. The total number of charters is expected to remain the same as it has in the past nine to ten years, and thus not significantly effect the overall operations forecast. These assumptions were utilized to develop Table 2-15 and are depicted on Figure 2-5.

Gallatin Field Airport

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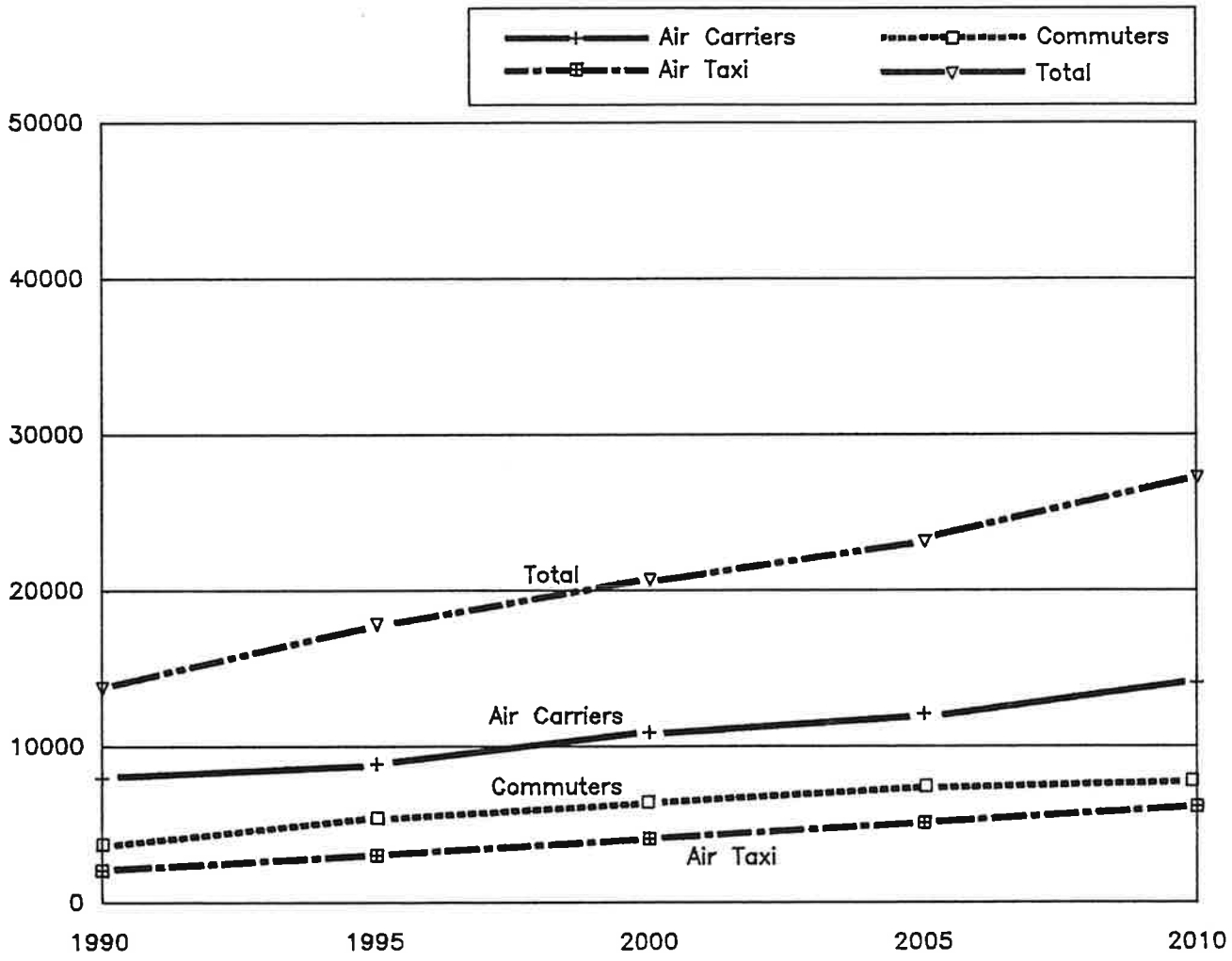


Forecast
Commercial Operations

Figure 2-5

Morrison Maierle/CSSA

TABLE 2-15
FORECAST OPERATIONS

	1990	PERCENT CHANGE	1995	PERCENT CHANGE	2000	PERCENT CHANGE	2005	PERCENT CHANGE	2010
AIR CARRIER	8,062	22.7(4.5)	9,888	18.5(3.7)	11,717	16.1(3.2)	13,606	13.9(2.8)	15,496
COMMUTER	3,758	22.7(4.5)	4,608	18.5(3.7)	5,460	16.1(3.2)	6,341	13.9(2.8)	7,221
AIR TAXI	2,065	22.7(4.5)	2,533	18.5(3.7)	3,002	16.1(3.2)	3,486	13.9(2.8)	3,970
TOTAL	13,885		17,029		20,179		23,433		26,687

Operations Based on Adjusted TAF

Historic Based Aircraft

The total based General Aviation aircraft as reported on FAA Form 5010, "Airport Master Records" is reported in Table 2-16 for the years 1983-1990. The 5010's divide aircraft into single, multi and jet engine categories. As shown in Table 2-16, the total based aircraft experiences a growth of approximately 11% between 1983 and 1988 and then declined approximately 5% from 1988 to 1990. The decline in based aircraft may be attributed to increased operating costs or the sale of local planes. General aviation based aircraft are expected to grow at a rate much slower than the commercial traffic previously estimated.

Airport management records of based aircraft were also reviewed. The records do not differentiate between single, multi or jet engine. Table 2-16 also includes the historic based aircraft by the Gallatin Airport Authority.

TABLE 2-16
HISTORIC BASED AIRCRAFT (1983-1992)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
SINGLE ENGINE	80	80	96	107	107	107	89	89	90	90
MULTI-ENGINE	10	10	8	3	3	3	7	7	5	5
JET ENGINE	1	0	1	1	1	1	0	0	0	0
TOTAL (5010)	91	90	105	111	111	111	96	96	95	95
TOTAL (A/P)	114	117	114	121	95	84	99	105	102	103

Source: Gallatin Airport Authority
FAA - 5010 Forms
Note: Sail Planes are not included in the figures presented

The 1988 Montana State Aviation System Plan Update listed 87 based aircraft at the Gallatin Field Airport in 1987 (74 single engine 5 multi-engine, 1 jet engine and 7 other). The System Plan states that projections for based aircraft were estimated using the assumption that based aircraft will increase at the same rate as local operations. Therefore, the number of local operations per based aircraft should remain constant over the planning period.

TABLE 2-17
FORECAST OF GENERAL AVIATION OPERATIONS AND BASED AIRCRAFT (1987-2005)

	1987	1990	1995	2000	2005	2010
GENERAL AVIATION						
Itinerant	6,700	7,000	7,000	8,000	8,000	8,300
Local	23,900	26,000	27,000	28,000	29,000	30,500
Total	30,600	31,700	33,400	35,200	37,000	38,800
Based Aircraft	95	105	117	120	123	130
Local Operations per Based Aircraft	274	236	236	236	236	236

Source. Montana Aviation Systems Plan Update. 1988.

* Local operations based aircraft modified to reflect actual based aircraft reported by airport management.

General Aviation Operations Forecast

Actual growth factors for the forecast of based aircraft in the System plan were based on growth factors developed from the FAA/s Terminal Area Forecasts projections of local General Aviation.

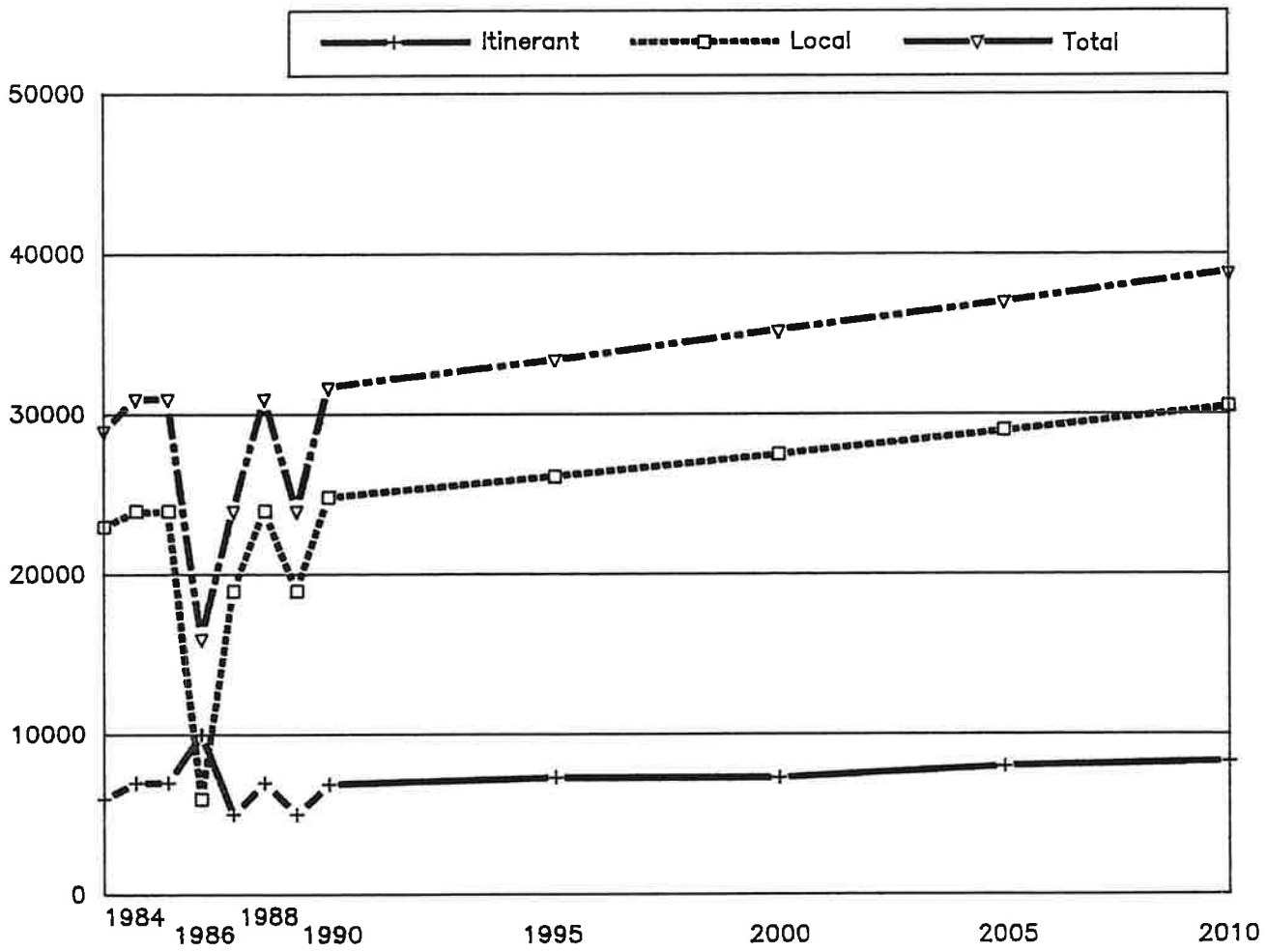
The Terminal Area Forecasts (FY 87-2000 & FY 89-2005) were reviewed and compared to the operations developed in Table 2-17, and found to be very similar. The 1987 operations were also compared to the Record Flight Service Activity Survey. The survey recorded 20,432 contacts in 1987 and 24,939 in 1990. Although the contacts recorded by FSS are 6,000 to 10,000 opera-

tions less than the same figures presented in Table 2-17, the forecasts are acceptable. The local FSS only records pilot contacts. Therefore, if a pilot contacts the FSS only once and then completes five (5) touch and go operations the FSS only counts one contact and not 5 departures and 5 approaches. Gallatin Field is also an uncontrolled airport. This means that a pilot is not required to have an aircraft radio or contact the FSS. Therefore, all operations completed by a pilot without a radio are not counted. Table 2-17 was modified to reflect the number of based aircraft reported by airport management in 1990. The numbers reported by airport management are developed by an annual survey of hangars, FBO's and the tiedown apron. Figure 2-6 and 2-7 depict the historic and forecast general aviation operation and based aircraft.

Gallatin Field Airport

Master Plan Update/

Terminal Feasibility Study



General Aviation Operations
Historic and Forecast

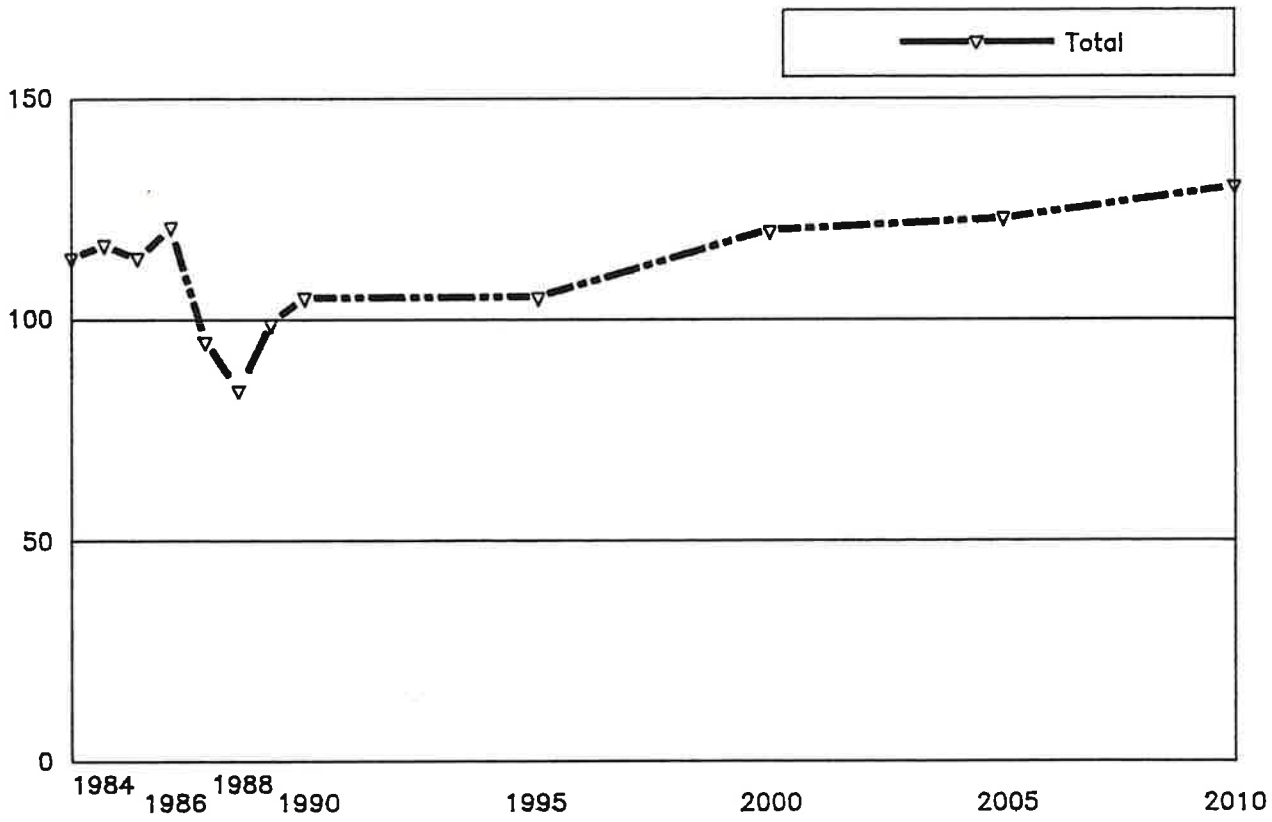
Figure 2-6

Morrison Maierle/CSSA

Gallatin Field Airport

Master Plan Update/

Terminal Feasibility Study



Based Aircraft
Historic and Forecast

Figure 2-7

Morrison Maierle/CSSA

Forecast General Aviation Enplanements

The value of 1.91 enplanements per itinerant G.A. departure, as determined in the Montana State Aviation System Plan Update, was considered reasonable for the forecast of general aviation enplanements at the Gallatin Field Airport. General aviation forecasts based on this value are shown in Table 2-18.

TABLE 2-18
FORECAST OF GENERAL AVIATION ENPLANEMENTS

	1990	1995	2000	2005	2010
Itinerant Departures	3,500	3,500	4,000	4,000	4,150
GA Enplanements	6,685	6,685	7,640	7,640	7,927

Air Cargo

Records of enplaned and deplaned freight and mail for the scheduled air carrier and commuter airlines serving the Gallatin Field Airport have been maintained by airport management. These records are summarized in Table 2-19 for the years 1983 through 1990. Pounds of freight and mail per departure and landing are summarized in Table 2-19.

Airmail and freight are also carried by Federal Express, United Parcel Service and the U.S. Post office. These carriers are not required to report their tonnage to Airport Management, therefore no historic records of enplaned and deplaned cargo are available for small package air taxi business. The air taxi carriers load and unload their cargo at the General Aviation Ramp.

A telephone interview was conducted with the manager of Federal Express in October, 1991. The area manager indicated that they typically deplane one ton per day and enplane 1/2 ton per day. The manager indicated as little as three years ago they deplaned 3/4 ton/day in enplaned 1/2 ton/day.

The air cargo carried by Federal Express alone is more than the total cargo carried by all commuter and air carriers combined. The general aviation ramp is not crowded now or projected to be in the twenty year planning period. Therefore, as air cargo carried by private air taxi increases in the future space for expansion is available in the general aviation ramp area.

Due to lack of any documentable data this plan is unable to forecast the total cargo carried both now and in the future.

TABLE 2-19
HISTORIC AIRLINE AIR CARGO
(tons)

	1983	1984	1985	1986	1987	1988	1989	1990
Air Carriers								
Enplaned Freight	113.8	146.0	127.1	110.1	97.3	79.3	88.7	87.8
Enplaned Mail	19.7	17.3	10.0	9.9	10.7	13.6	18.8	16.0
Subtotal	133.5	163.3	137.8	120.0	108.0	92.9	107.5	103.8
Deplaned Freight	177.6	188.1	166.6	144.6	123.8	147.6	188.5	193.1
Deplaned Mail	18.7	29.9	10.7	16.3	20.9	14.7	18.8	23.4
Subtotal	193.6	218.0	177.3	160.9	144.7	162.3	207.3	216.3
Commuters								
Enplaned Freight	0	0	0	0.6	1.9	2.9	1.5	2.7
Enplaned Mail	0	0	0	0.5	1.5	0.7	0	0.1
Subtotal	0	0	0	1.1	3.4	3.6	1.5	2.8
Deplaned Freight	0	0	0	1.8	10.1	9.3	8.5	13.3
Deplaned Mail	0	0	0	0	0.2	1.2	0.4	0.3
Subtotal	0	0	0	1.8	10.3	10.5	8.9	13.6
Totals	113.8	146.0	127.8	110.9	99.2	81.2	90.2	90.5
Deplaned Freight	177.6	188.1	166.6	146.4	133.9	156.9	197.0	206.4
Deplaned Mail	18.7	29.9	10.7	16.3	21.1	15.9	19.2	23.7
TOTAL	196.3	218.0	177.3	162.7	155.0	172.8	216.2	230.1
TOTAL CARGO	398.8	381.3	315.1	309.1	288.9	329.7	325.2	336.7

SOURCE: Gallatin Field Airport Files

The 1983 to 1990 enplaned and deplaned cargo presented in Table 2-19 indicates little or no increase in the total tonnage of air mail and freight passing through the airport terminal. Although passenger enplanements have substantially increased in the time frame, cargo shipped has remained constant. The cargo shipped by commercial carriers over the next twenty years is expected to increase, but at a much slower rate than total aircraft operations.

Aviation Forecast Summary

The aviation forecasts for the next twenty years at the Gallatin Field Airport were developed from Historic data found in

Airport Management files and through review and comparison of the forecasts presented in the State Aviation System Plan updates, the FAA Terminal Area Forecasts, the National Plan of Integrated Airport Systems and the 1972 Gallatin Field Airport Master Plan.

As shown in Table 2-7 the Historic Boardings have increased over 569% since 1972 or an average of 10.05% per year. The past 10 year period from 1983 to 1992 have been typical with an average increase of 10.0% per year.

The past 20 years has seen rapid population growth in Gallatin county from 32,505 residents to 50,463 in 1990. The U.S. Bureau of Census projects Gallatin County and the trade area to grow at nearly 1.5 times the projected state average. Gallatin County and the trade area have been discovered by many out of state people including many wealthy movie stars and professionals as the place to relax or retreat to from their daily grind. The economic indicators point to a recent history of rapid development and a healthy indication of more of the same in the future. The trade area has seen increased recreational activity associated with Yellowstone National Park, Big Sky and Bridger Bowl Ski Areas, as well as other winter and summer activities. The combination of these elements indicate a strong growth in aviation activities of all kinds at Gallatin Field.

Commercial enplanements are expected to continue to grow from the current level of 153,812 passengers to between 248,920 and 285,920 passengers in the year 2010. To accommodate the increased number of passengers, the commercial operations must also increase. The plan indicates that operations will increase to 15,496 air carrier and 7,221 commuter. To accommodate this many annual operations thirty-two (32) flights per day would be required.

Gallatin Field currently shares aircraft with other cities such as Billings, Butte and Missoula. It is felt that as enplanements continue to grow, the sharing of aircraft seats with other cities will be discontinued. If this happens, the average number of passengers per departure will increase and reduce the number of operations required. As flight schedules and airplane stops are regulated by the airlines, the Master Plan could not adjust the forecast operations depicted to reflect the increased load factor.

Table 2-20 summarizes the aviation forecasts:

TABLE 2-20
SUMMARY OF AVIATION FORECASTS (1988-2008)

	1990	1995	2000	2005	2010
ENPLANED PASSENGERS					
Air Carrier	122,953	150,787	178,679	207,495	202,130
Commuter	6,575	8,064	9,555	11,096	38,930
Air-Taxi/Charter	1,972	2,419	2,866	3,329	11,680
Total Commercial Enplanements	131,500	161,270	191,110	221,920	252,740
AIRCRAFT OPERATIONS					
Air Carrier	8,062	9,888	11,717	13,606	15,496
Commuter	3,758	4,608	5,460	6,341	7,221
Air-Taxi/Charter	2,025	2,533	3,002	3,486	3,970
General Aviation					
Itinerant	7,000	7,000	8,000	8,000	8,300
Local	26,000	27,000	28,000	29,000	30,500
Total Operations	46,848	51,209	56,179	60,433	65,487
Based Aircraft	105	117	120	123	130

B:CHAPTER
02/23/93

GALLATIN FIELD AIRPORT
MASTER PLAN UPDATE/TERMINAL FEASIBILITY STUDY
CHAPTER 3 - DEMAND/CAPACITY

I. INTRODUCTION

Since the 1972 Gallatin Field Airport Master Plan was prepared, a new Advisory Circular "Airport Capacity and Delay" 150/5060-5, dated 9/23/83, was prepared to refine outdated capacity calculations and redefined annual and hourly capacity and delay.

The capacity of an airport is defined as the maximum number of operations (landings and takeoffs) that can take place in an hour. Delay is defined as the difference in time between a constrained and an unconstrained aircraft operation. Therefore, as the demand for use of the runway(s) approaches the hourly capacity, unacceptable delays will occur. By comparing the cost of capital improvements with the benefits realized by avoiding delays, decisions concerning future development can be made. As shown in the next section, no capacity problems exist at the Gallatin Field Airport. Therefore, capacity and delay are not major considerations in the determination of future facility requirements.

The annual service volume (ASV) is a measurement of the airports annual capacity. ASV accounts for differences in runway use, aircraft mix, weather conditions, etc., that would be encountered over a year's time.

II. HOURLY CAPACITY AND ANNUAL SERVICE VOLUME

AC 150/5060-5 provides a number of methods for determining the hourly airport capacity and annual service volume. The simplified method makes a number of assumptions such as: arrivals equal departures; no airspace limitations exist which would adversely impact flight operations or otherwise restrict aircraft, which could operate at the airport; the IFR weather conditions occur roughly 10 percent of the time.

The runway configuration best representing Gallatin Field Airport was selected from 19 different configurations presented in Figure 2-1 of AC 150/5060-5. A mix index was then calculated and applied to Figure 2-1 in the AC to determine the hourly capacities and annual service volume.

The mix index for aircraft operations is a mathematical expression determined by adding the percent of aircraft which weigh between 12,500 and 300,000 lbs. plus three times the per-

cent of aircraft weighing over 300,000 lbs. Based on review of 1990 operations and the operations forecast for the year 2010, approximately 25 percent of the operations will be by aircraft weighing between 12,500 and 300,000 lbs. Since very few aircraft weighing over 300,000 lbs. operate at the airport, a mix index of 25 percent was calculated.

Based on a mix index of 25 percent and runway use configuration No. 1, hourly VFR and IFR capacities of 74 and 57 respectively and an annual service volume of 195,000 operations are read directly from Figure 2-1 of AC 150/5060-5 (see Table 3-1).

The hourly capacity of the airport was also determined based on a more detailed review of the Gallatin Field Airport facilities and historic operations. Assumptions, calculations, and review of Gallatin Field Airport plans were made to determine the VFR and IFR arrivals, the percent of touch and go operations, and locations of exit taxiways. The above data was applied to FAA guidelines presented in AC 150/5060-5 in determining a VFR hourly capacity of 87 and IFR hourly capacity of 60 for the airport (see Table 3-1).

The annual service volume for the Gallatin Field Airport was also determined by analyzing the different runway use over the course of a year (IFR vs. VFR). For the exercise, it was assumed that 30% of the arrival operations are IFR, 68% of the operations are VFR and that the airport is below operation minimums 2% of the time. Therefore, the weighted hourly capacity was calculated to be 79. Hourly and daily demand ratios were assumed to be typical.

Based on the above assumptions, an annual service volume of 237,000 was calculated (see Table 3-1).

The Montana State Aviation Systems plan showed VFR and IFR hourly capacities of 74 and 57 respectively and an annual service volume of 195,000 operations. A one runway configuration and a mix index between 21 and 50 were applied to Figure 2-1 of AC 150/5060-5 to arrive at these values (see Table 3-1).

III. CONCLUSION

No capacity or delay problems are foreseen at the Gallatin Field Airport. The operations forecast of 65,487 for the year 2010 is approximately 37 percent of the average annual service volume capacity. The Montana State Aviation System Plan concludes that none of the scheduled air-service airports will exceed airfield capacity through the planning period ending in the year 2005.

TABLE 3-1
HOURLY CAPACITY AND ANNUAL SERVICE VOLUME

ANALYSIS	MIX INDEX	HOURLY CAPACITY OPS/HOUR VFR	HOURLY CAPACITY OPS/HOUR IFR	ANNUAL SERVICE VOLUME OPS/YEAR
SIMPLIFIED	21 TO 50	74	57	195,000
DETAILED	25	87	60	237,000
MSSPU	21 TO 50	74	57	195,000

Therefore, the recommended development of the runway, taxiways, and apron areas will not be based on capacity or delay problems. The facility requirements outlined in Chapter 4 are primarily based on safety needs, proper airport layout, demand, and improvements required to rehabilitate deteriorating or failed areas. The demand/capacity aspects of the terminal building will be discussed in Chapter 5 "Terminal Feasibility".

GALLATIN FIELD AIRPORT
MASTER PLAN UPDATE/TERMINAL FEASIBILITY STUDY
CHAPTER 4 - FACILITY REQUIREMENTS

I. INTRODUCTION

The facility requirements section of this study defines the physical facilities needed to safely and efficiently accommodate the current and future demands at Gallatin Field Airport. The recommended developments for the twenty year planning period are based on the aviation forecasts presented in Chapter 2, the Demand/Capacity analysis presented in Chapter 3, and safety considerations.

Standard criteria for airport facilities are found in the Federal Aviation Administration's Advisory Circulars and Regulations. The time frames for construction of the recommended developments are determined and presented in this chapter. Developments are generally planned for three time periods:

* Phase I 1993-1997
* Phase II 1998-2002
* Phase III 2003-2012

Since the activity forecasts are dependent upon the occurrence of other future events, they may differ from the actual results achieved. Therefore, it is important to review and compare the actual activity levels to the forecasts. If the aviation activity increases or decreases from the forecast levels, then the time frames for development may be accelerated or delayed as needed. The methods of funding the proposed developments will be discussed in the financial chapter of this study.

II. AIRFIELD FACILITIES

General

An airport is designed to serve the most demanding aircraft utilizing the airport on a regular basis. Aircraft are grouped based on their Aircraft Approach Category (AAC) and Airplane Design Group (ADG) making up the Airport Reference Code (ARC). The ARC is further subdivided into those airports serving large and small airplanes. A small airplane is an airplane of 12,500 pounds or less maximum certified take off weight. A large airplane includes all airplanes with a maximum certified take off weight greater than 12,500 pounds. Runway 12-30 at Gallatin Field serves both large and small aircraft in approach categories A, B, C & D.

Approach Category

The "Approach Category" of an aircraft is based on 1.3 times the stall speed of the aircraft at the maximum certificated landing weight.

The aircraft approach categories are:

Category A: Speed less than 91 knots;

Category B: Speed 91 knots or more but less than 121 knots;

Category C: Speed 121 knots or more but less than 141 knots;

Category D: Speed 141 knots or more but less than 166 knots;

Category E: Speed 166 knots or more.

Airplane Design Groups

In addition to approach categories for aircraft, the FAA has established airport design groups based on aircraft wingspan. Airport dimensional standards are keyed to the various airplane design groups. The airplane design groups are:

Airplane Design Group I: Wingspan up to but not including 49 feet;

Airplane Design Group II: Wingspan 49 feet up to but not including 79 feet;

Airplane Design Group III: Wingspan 79 feet up to but not including 118 feet;

Airplane Design Group IV: Wingspan 118 feet up to but not including 171 feet;

Airplane Design Group V: Wingspan 171 feet up to but not including 214 feet; and

Airplane Design Group VI: Wingspan 214 feet up to but not including 262 feet.

Examples of various aircraft, their approach category, and design group are listed on Table 4-1.

TABLE 4-1
TYPICAL AIRCRAFT APPROACH CATEGORIES AND DESIGN GROUPS

AIRCRAFT	APPROACH CATEGORY	DESIGN GROUP
Beechcraft		
Bonanza	A	I
King Air (B100)	B	I
Super King Air	B	II
E-18	A	II
Boeing		
727-200	C	III
737-200	C	III
737-300	C	III
757-200	C	IV
767-300	C	IV
747-400	D	V
Cessna		
Citation I	B	I
402	B	I
421	B	I
Embraer		
EMB-120 Brasilia	B	II
McDonnell - Douglas		
DC-3	A	III
MD 80 Series	C	III
DC-9-32	C	III
DC-9-51	C	III
DC-10-30	D	IV
Piper		
Cheyenne	B	I
Navajo	B	I
Swearingen		
Merlin	B	I
Metro	B	I
Metro III	B	II

The minimum dimensions required by the FAA for the different Design Group Categories are summarized on Table 4-2 for Approach Categories C & D for Precision Instrument Runways and Table 4-3 for Nonprecision Instrument and Visual Runways for Approach Category A & B.

TABLE 4-2
PRECISION INSTRUMENT RUNWAY
DIMENSIONAL STANDARDS FOR APPROACH CATEGORY C & D

	ITEM	DESIGN GROUP I	DESIGN GROUP II	DESIGN GROUP III	DESIGN GROUP IV
RUNWAY	LENGTH OF PAVEMENT	--(SEE TABLE 4-4)--			
	WIDTH OF PAVEMENT	100	100	100*	150
	WIDTH OF SAFETY AREA	500	500	500	500
	LENGTH OF SAFETY AREA	1,000 FEET BEYOND EACH RUNWAY END			
	RUNWAY SHOULDER WIDTH	10	10	20*	25
	RUNWAY BLAST PAD WIDTH	120	120	140*	200
	RUNWAY BLAST PAD LENGTH	100	150	200	200
	WIDTH OF RUNWAY OBJECT FREE AREA	800	800	800	800
	LENGTH OF RUNWAY OBJECT FREE AREA	1,000 FEET BEYOND EACH RUNWAY END			
TAXIWAY	WIDTH OF PAVEMENT	25	35	50**	75
	WIDTH OF SAFETY AREA	49	79	118	171
	TAXIWAY EDGE SAFETY MARGIN***	5	7.5	10**	15
	WIDTH OF TAXIWAY OBJECT FREE AREA	89	131	186	159
SEPARATIONS	RUNWAY CENTERLINE TO PARALLEL TAXIWAY CENTERLINE	400	400	400	400
	RUNWAY CENTERLINE TO PARKED AIRCRAFT	500	500	500	500
	TAXIWAY CENTERLINE TO FIXED OR MOVABLE OBJECT AND PROPERTY LINE	44.5	65.5	93	129.5
	TAXILANE CENTERLINE TO FIXED OR MOVABLE OBJECT	39.5	57.5	81	112.5

* For airplanes in Design Group III with a maximum certified takeoff weight greater than 150,000 lbs., the standard runway width is 150 feet, the shoulder width is 25 ft. and the runway blast pad width may be increased to 200'.

** For Airplane Design Group III taxiways intended to be used by airplanes with a wheelbase equal to or greater than 60 feet, the standard taxiway width is 60', the taxiway edge safety margin is 15'.

*** The taxiway edge safety margin is the minimum acceptable distance between the outside of the airplane wheels and the pavement edge.

TABLE 4-3
DIMENSIONAL STANDARDS FOR AIRPORTS SERVING SMALL AIRCRAFT (NON PRECISION INSTRUMENT AND VISUAL RUNWAYS) APPROACH CATEGORIES A & B

	ITEM	DESIGN GROUP I	DESIGN GROUP II
RUNWAY:	Length of Pavement	----(SEE TABLE 4-7)------	
	Width of Pavement	60	75
	Width of Safety Area	120	150
	Length of Safety Area Beyond Runway Threshold	240	300
	Width of Runway Object Free Area	400	500
	Length of Runway Object Free Area	500	600
TAXIWAY:	Width of Pavement	25	35
	Width of Safety Area	49	79
	Width of Taxiway Object Free Area	89	131
SEPARATIONS:	Runway Centerline to Parallel Taxiway Centerline	225	240
	Runway Centerline to Bldg. Restriction Line	200	250
		251*	251*
		376**	376**
	Taxiway Centerline to Parked Aircraft or Object	45	66

*For a visual approach, BRL based on FAA standard criteria and a 7:1 transitional surface clearing a structure with roof peak of 18 feet.

**For a nonprecision instrument approach, BRL based on FAA standard criteria and a 7:1 transitional surface clearing a structure with roof peak of 18 feet.

Dimensional standards for runways serving small airplanes are dependent upon the airplane design group and runway instrumentation configuration. The runway instrumentation configuration refers to the type of approach procedure utilized at the facility. Depending on the approach procedure utilized, the runway may be classified as either a visual, nonprecision instrument, or precision instrument runway. The dimensional standards

for Runways shown on Table 4-3 are for visual and nonprecision instrument approaches.

A Visual Runway is a runway solely intended for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA approved airport layout plan, or on other planning documents.

A Nonprecision Instrument Runway is one with an instrument approach procedure utilizing air navigation facilities, with only horizontal guidance, or area type navigation equipment for which a straight-in nonprecision instrument approach procedure has been approved or planned and no precision approach facility or procedure is planned or indicated on an FAA approved airport layout plan or other planning document.

A Precision Instrument Runway is one with an instrument approach procedure utilizing an instrument landing system (ILS), microwave landing system (MLS), or precision approach radar (PAR). A planned precision instrument runway is one which a precision approach system or procedure is indicated on an FAA approved airport layout plan or other approved planning document.

Wind Data

Prevailing winds are the primary factor in determining runway orientation. The most desirable orientation based on wind is one which has the largest wind coverage and minimum crosswind components.

When a runway orientation provides less than 95 percent wind coverage for any aircraft forecasted to use the airport on a regular basis, a crosswind runway is recommended. The 95 percent wind coverage is computed on the crosswind component not exceeding 10.5 knots for Airport Reference Codes A-I and B-I, 13 knots for Airport Reference Codes A-II and B-II, 16 knots for Airport Reference Codes A-III and B-III and C-I to D-III, and 20 knots for Airport Reference Code A-IV through D-VI.

Five (5) individual wind roses were developed and presented in Figures 1-11 from available wind data for the months of October 1989 through March 1991. Runway 12-30 is the air carrier runway at Gallatin Field serving aircraft ranging from Design Group II through IV. This runway provides 95.230% wind coverage for the 13 knot crosswind component. Although this runway pro-

vides the minimum coverage required by the FAA, the percent of wind coverage of recent winds is 2.75% less than the wind coverage for 1965-1969.

Runway 3-21 currently serves aircraft of Design Group B-I. The combined wind coverage of Runway 12-30 and 3-21 is 99.492% for a 10.5 knot crosswind. This coverage is excellent for small general aviation aircraft. Immediate development of Runway 3-21 is not required from a wind coverage standpoint for Design Group B-I aircraft.

The updated wind data indicates however, the desirability of constructing Runway 3-21 to serve aircraft of Design Group B-II.

In analyzing wind roses, the strength of the crosswind component must be noted. At Gallatin Field, at certain times of the year, the south wind component is quite strong, making crosswind operations on Runway 12-30 difficult for larger general aviation aircraft. Because of the strength of the winds and the use of the airport by a fair number of itinerant aircraft pilots inexperienced in mountain flying, extension and construction of the runway to B-II standards can be justified.

Extension of Runway 3-21 is required due to FAA design standards concerning lack of sight distance when the general aviation is full of parked aircraft. This is discussed in the Runway 3-21 Length Requirements section.

Runways

There are two active runways at Gallatin Field Airport. Air carrier Runway 12-30 accommodates aircraft up to and including Design Group IV, and Runway 3-21 accommodates small aircraft in Design Group I when the crosswind component of wind perpendicular to Runway 12-30 is greater that 10.5 nautical miles per hour.

Runway Length Requirements - Runway 12-30

The runway length requirements for various aircraft which may utilize the airport in the future were analyzed using airplane characteristics data supplied by manufacturers. The aircraft manufacturer's data is based on standard day temperature (59°F at sea level) plus a fixed number of degrees. For example, 737 data is based on standard temperature plus 27°F. At Gallatin Field Airport this equates to 70.0°F after adjusting for the altitude of the airport. For comparative purposes, all data was adjusted to reflect the mean maximum daily temperature of the hottest month of the year of 83°F. Runway lengths were also adjusted to reflect the effective runway gradient of 0.43%. No adjustments for wind were made when determining the runway lengths presented in Table 4-4.

To establish the required runway lengths using the manufacturer's literature, a maximum non-stop flight distance for the planning period was determined. The longest non-stop jet service currently serving Gallatin Field Airport is from Bozeman to Denver, approximately 450 nautical miles. For this study, runway lengths were determined using Denver (450 nautical miles) as the destination for non-stop flights.

Although the current runway length of 9,000 feet is sufficient to accommodate all of the aircraft listed in Table 4-4, most are prohibited from operating at the mean maximum daily temperature and at the maximum design takeoff weight because of the airport's elevation and existing runway length. Based on the actual runway lengths, of 9,000 feet and a proposed extension of 1,500 linear feet west to 10,500 feet, the percentage of maximum payload for aircraft flying non-stop 450 nautical miles are shown on Table 4-5.

TABLE 4-4
RUNWAY LENGTH REQUIREMENTS
AND MAXIMUM DESIGN TAKEOFF WEIGHTS

AIRCRAFT	RUNWAY LENGTH REQUIREMENTS (FEET) 450 NAUTICAL MILES/1	MAXIMUM DESIGN TAKEOFF WEIGHT (LBS.) 450 NAUTICAL MILES/2
McDonnell-Douglas		
MD 81	N/A	140,000
MD 82, 88	12,200	149,500
MD 83	N/A	160,000
MD 87	N/A	149,500
McDonnell-Douglas		
DC-9-30-9	10,000	97,400
DC-9-50-17	12,500	109,400
DC-10-10	14,100	405,300
Boeing		
737-200-9	8,910	75,000
737-200-9 2% SPEED INCREASE	9,400	99,900
737-200-15	6,900	99,000
737-300	10,800	138,500
Boeing		
727-100-7	12,800	163,000
727-100-9	10,950	151,500
727-200-7	13,100	162,500
727-200-9	13,200	170,000
727-200-Adv.15	13,700	184,000
757-200	14,300	238,900
Lockheed		
L-1011	12,000	394,600

/1 Required length in feet for 450 nautical mile non-stop flight based on maximum design takeoff weight, runway elevation of 4,476 MSL, mean maximum daily temperature of 83°F., and runway gradient of 0.43%. Runway length was not adjusted for wind.

/2 Maximum Design Takeoff Weight for 450 nautical mile non-stop flights based on runway elevation of 4,476 MSL, mean maximum daily temperature of 83°F, and runway gradient of 0.43. Runway length was not adjusted for wind.

Note: N/A reflects that the required runway lengths of the assumed conditions are off the charts provided in the airlines operations data.

TABLE 4-5
MAXIMUM DESIGN TAKEOFF WEIGHTS AND PERCENT OF MAXIMUM PAYLOAD

AIRCRAFT	MAXIMUM TAKEOFF WEIGHT 9,000' RUNWAY, 83°F, 5,545' MSL (LBS.)	PERCENT OF MAXIMUM PAYLOAD 9,000' RUNWAY, 450 NAUTICAL MILES	PERCENT OF MAXIMUM PAYLOAD 10,500' RUNWAY, 450 NAUTICAL MILES
McDonnell-Douglas			
MD 81	128,000	91	94
MD 82, 88	140,000	94	97
MD 83	143,000	89	94
MD 87	139,000	93	96
McDonnell-Douglas			
DC-9-30-9	94,000	97	97
DC-9-0-17	100,000	91	100
DC-10-10	372,000	92	99
BOEING			
737-200-9	95,000	91	97
737-200-9 2% SPEED INCREASE	97,000	78	88
737-200-15	99,000	88	94
737-300	132,500	96%	99
BOEING			
727-100-7	149,000	91	99
727-200-7	148,000	91	97
727-200-9	154,000	91	95
727-200-ADV.15	166,000	90	95
757-200	220,000	92	96
LOCKHEED			
L-1011	360,000	91	97

NOTE: Takeoff weights were not adjusted for wind.

This plan recommends that the Airport Authority continue to review load factors with the commercial airlines using the airport and develop Runway 12-30 to 10,500 feet in length during the 20 year planning period.

The design strength of Runway 12-30 is adequate to serve all aircraft anticipated to serve Gallatin Field at the maximum take off weight.

The aircraft manufacturer's state that the data presented in the aircraft characteristics manual is for general planning purposes and that the airlines using the airport should be contacted prior to any facility design.

Runway Length Requirements - Runway 3-21

Runway 3-21 serves aircraft in Approach Categories A and B, therefore, the design criteria for small airplanes may be applied. Runway length separates general aviation airports into three basic types. These airports are expected to have the following types of activity:

75% OF FLEET: This type of airport serves about 75 percent of the single-engine and small twin-engine airplanes used for personal and business purposes. This type of airport is designed for small airplanes in Airport Reference Code B-I.

95% OF FLEET: This type of airport serves 95% of the fleet (all airplanes of Stage I plus some small business and air taxi type twin-engine airplanes.) This type of airport is also designed for small airplanes in Airport Reference Code B-I.

100% OF FLEET: This type of airport serves all small airplanes with wing spans less than 79 feet in Airport Reference Code B-I and B-II.

Table 4-6 lists a number of small airplanes (small airplanes weigh 12,500 pounds and less and large airplanes weigh more than 12,500 pounds) which are served by the different airport types.

TABLE 4-6
EXAMPLES OF SMALL AIRPLANES ACCOMMODATED BY AIRPORT TYPE

75% OF FLEET		95% OF FLEET		100% OF FLEET	
Beech	B19 Sport/150	Beech	F33A Bonanza	Beech	B58P Baron
	B24R Sierra/200		V35B Bonanza		B60 Duke
			A 36 Bonanza		B80 Queen Air
Bellanca	Citabria Series		C23 Sundowner		E90 King Air
	8GCBC Scout		B55 Baron		B99 Airliner
	300A Super Viking				
		Cessna	204 Skywagon	Cessna	340A
Cessna	150 Series		377 Skymaster		402 Businessliner
	172 Skyhawk		P377 Skymaster		421
	182 Skylane		310		
	T206 Stationair			Piper	PA-24 Series
		Piper	PA-32-260		PA-30-150 Twin
Piper	PA-11 thru PA-22		Cherokee Six		Commanche
	PA-28 Series		PA-23-250 Aztec		PA-31-350 Chieftain

TABLE 4-6

EXAMPLES OF SMALL AIRPLANES ACCOMMODATED BY AIRPORT TYPE (cont.)

	75% OF FLEET	95% OF FLEET	100% OF FLEET
Piper	PA-32-300 Cherokee	Piper PA-34-200 Senaca II	Piper PA-42-1000 Cheyenne
		Ted Smith Aerostar 600	
Rockwell	112 A Commander	Aerostar 601	Rockwell 500S Shrike
	112 TC Commander		
	114 Commander	Also accommodates airplanes listed under Stage I-75% of Fleet	Also accommodates airplanes Listed under Stage II-95% of Fleet

Source: FAA AC 150/5300-4B

FAA Advisory Circular 150/5325-4A, entitled Runway Length Requirements for Airport Design, contains runway length curves for each type of runway. It further states that, where practical, a crosswind runway should be at least 80 percent of the recommended length obtained from the runway length curves. Applying a mean maximum daily temperature of 83°F and an elevation of 4,476' MSL for the Gallatin Field Airport, the lengths for each type of runway and the required crosswind runway length are shown in Table 4-7.

TABLE 4-7
REQUIRED SMALL AIRPLANE RUNWAY LENGTHS (FT.)

Runway Type	Primary Runway Length	Crosswind Runway Length*
Stage I - 75% of Fleet	4,200	3,360
Stage II - 95% of Fleet	5,500	4,400
Stage III - 100% Of Fleet	5,700	4,560

* Based on 80% of Primary Runway Length.
Airport Elevation 4,476'
Mean Maximum Daily Temperature 83°

The accelerate-stop distance must be considered when computing the required lengths for runways which serve airplanes with a seating configuration of 10 passenger seats or more. The FAA permits the use of curves for runway length determination for small aircraft serving 100% of the general aviation fleet.

Therefore, the runway length requirement for the following representative airplanes is the same as that for 100% of Fleet.

Beech B80 Queen Air;
Beech A90 King Air;
Beech 99A Airliner;
Beech A100 King Air;
Britten-Norman Mark III-I Trilander:
Mitsubishi MU-2L;
Swearingen Merlin III-A;
Swearingen Merlin IV-A; and
Swearingen Metro II.

The length of Runway 3-21, 3,412 feet, is an acceptable crosswind runway and accommodates 75% of the aircraft weighing 12,500 lbs. or less. In order to accommodate higher performance aircraft in the remaining 25% of the General Aviation Fleet during calm conditions, a runway length of 5,700 feet should be considered.

When the general aviation apron is fully utilized by parked aircraft, the current FAA line of sight requirements require the Runway 3 threshold to be relocated to the north a distance of 750 feet. This relocation makes the runway inadequate for use by B-I aircraft during for any type of operation.

Runway 3-21 serves an important operational need at the airport. By virtue of its location, it can and does serve as the primary general aviation runway for 95% of the airport's GA operations.

FAA policy supports full development of general aviation airports to serve 95% of the fleet and recommends land acquisition and approach protection be acquired to permit expansion to 100% of the fleet. As a minimum, when the Runway 3 threshold is relocated, Runway 3-21 should be constructed to at least 4,400 feet, the crosswind runway length of 95% of General Aviation Fleet and land acquired for an ultimate length of 5,700 feet (100% fleet length).

The proposed Runway 3-21 extension and land acquisition will require preparation of an Environmental Assessment and its approval by the FAA.

Pavement Strength - Runway 12-30

Runway 12-30 has pavement strength ratings of 140,000 lbs. for single wheel loading, 200,000 lbs. for dual wheel loading, and 400,000 lbs. for dual tandem wheel loading. The runway was overlaid with 1 1/2" of Bituminous Porous Friction Course (PFC) in 1988. No significant increase in pavement strength was attributed to the overlay, however, it did improve snow removal,

drainage, friction characteristics, and reduced reflective cracking. With proper preventative maintenance activities, such as minor crack sealing and surface repairs, no major resurfacing work should be required until Phase III of this Master Plan. Based on the aviation forecast, no increase in pavement strength is required throughout the planning period.

At the present time, the runway design strength is sufficient to accommodate the largest air carrier aircraft using Gallatin Field Airport. The estimated takeoff weights for a 450 nautical mile trip for the airport currently using the airport are below the runway design strength. Should an air carrier express an interest in providing Gallatin Field with long distance direct flights on larger aircraft, a review of the pavement strength should be completed.

Pavement Strength - Runway 3-21

Runway 3-21 has a strength rating of 12,500 lbs. for single wheel gear (SWG) loading. The runway was constructed to an all weather runway in 1985 as a part of AIP 05-06 project. All undesirable material was subexcavated to E-1 material and replaced with select borrow. A four inch crushed gravel leveling course was placed followed by MC-70 prime coat and 2 1/2 inches of dense graded bituminous surface course. The improvements also included a 1 inch nominal depth of bituminous open graded friction course. The runway performance is excellent, with little or no transverse or longitudinal cracking. The runway was fog sealed in 1991 with SS-1h emulsified asphalt.

Based on the general aviation forecasts, a design strength of 16,000 SWG should be provided for Runway 3-21 and additional strength requirements should be reviewed and provided during the planned runway improvements. If development occurs requiring aircraft with a seating configuration of 10 passengers seats or more, the pavement strength should modified as necessary. The excellent construction ptractices utilized in the 1985 Runway 3-21 project will make any required increase in runway strength easy to achieve through the use of asphalt overlays.

It should be noted that an aircraft weighing 16,000 lbs. is considered a large aircraft, and the primary surface width increases to 500 feet. Due to the fact that many of the smaller corporate jets weigh between 12,500 and 20,000 pounds and are in the A-I through B-II Design Groups, the airport Layout Plan shows a future primary surface width of 500 feet.

Hangars/Tiedowns

The required number of hangar spaces and tiedowns are directly related to the number of based aircraft. Presently, there are 105 based aircraft at the airport with hangar space for approximately 80 aircraft. A recent survey of based aircraft

indicated that approximately 75 percent were hangared. Assuming this percentage throughout the planning period, the required number of hangar spaces is shown on Table 4-8.

TABLE 4-8
REQUIRED HANGARS

YEAR	BASED AIRCRAFT	HANGAR SPACE AVAILABLE	HANGAR SPACE REQUIRED (75% OF BASED AIRCRAFT)
1990	105	80	79
1995	114	--	88
2000	120	--	90
2010	130	--	98

Table 4-8 indicates the need for additional hangar space for eighteen (18) aircraft within the planning period. The south hangar area provides space for eight (8) additional hangars at this time. As demand dictates the need for additional hangars, the taxiways in the south hangar area can meet the demand. The front line of the G.A. apron provides adequate space for the larger hangars required by the FBO's using the airport. If the need arises for additional hangars, this apron can expand to the west.

Tiedowns must be available for those based aircraft not hangared and for itinerant aircraft. The number of tiedowns for itinerant aircraft are determined from peak day operations. According to the forecasting methodology, the busy itinerant day is 10 percent more active than the average day, and an additional increase of 10 percent is suggested to accommodate expansion. This is not the highest number of operations occurring on a given day, but it is the average of the busy days. The forecasts for itinerant operations per based aircraft in this study vary from 66 itinerant operations per based aircraft in 1990 to a forecast of 64 itinerant operations per based aircraft in 2010.

The forecasts for general aviation operations are presented in Chapter 2, Table 2-17 for both local and itinerant operations. A local operation is a touch and go or other training operation in which the aircraft does not leave the immediate vicinity of the airport. An itinerant operation constitutes all aircraft operations except touch and go and training operations. Since one operation is either a landing or take-off, only half of the busy day operations represent an aircraft on the apron and in need of a tiedown. Some aircraft, for example, aircraft stopping

for fuel or a passenger pick-up, will not be on the apron long enough to require a tiedown. The number of tiedowns required for itinerant aircraft are shown on Table 4-9.

TABLE 4-9
ITINERANT AIRCRAFT TIEDOWNS

YEAR	FORECAST ITINERANT OPERATIONS	ITINERANT OPERATIONS PER BASED AIRCRAFT	AVG. DAY OPERATIONS	PEAK DAY FACTOR	PEAK DAY OPERATIONS	ITINERANT AIRCRAFT TIEDOWNS
1990	6,900	65.7	45	1.2	54	27
1995	7,300	62.4	47	1.2	56	28
2000	7,700	64.2	50	1.2	60	30
2010	8,300	63.8	54	1.2	64	32

* Assumed that July is the busiest month with 20% of the total annual operations, peak day factor of 20% and parked aircraft equal 50% of peak day operations.

Tiedowns are also required for based aircraft which are not hangared. The total tiedown requirements shown on Table 4-10 assume that 25% of the based aircraft will require tiedowns.

TABLE 4-10
TOTAL TIEDOWNS

YEAR	BASED AIRCRAFT	BASED AIRCRAFT TIEDOWNS	ITINERANT AIRCRAFT TIEDOWNS	CONTINGENCY	TOTAL TIEDOWNS REQUIRED	EXISTING TIEDOWNS
1990	105	26	27	4	57	71
1995	117	29	28	4	61	71
2000	120	30	30	4	64	71
2010	130	32	32	4	68	71

Contingency tiedowns are generally on turf and are used to accommodate aircraft on particularly busy days when no paved tiedowns are available. Since there are 71 paved tiedowns now available at the airport, paved tiedowns should always be available. Some aircraft owners may, however, prefer the less expen-

sive turf tiedowns. The need for new tiedowns is not forecast within the planning period.

General Aviation Apron

Planning criteria allows 300 square yards of tiedown apron per based aircraft and 360 square yards per itinerant aircraft (Table 4-11). These areas include taxi and maneuvering area.

The existing General Aviation Apron is in excess of 64,000 square yards. The apron is not crowded and will meet the forecast needs for the planning period. The pavement strength is adequate for only small aircraft (less than 12,500 lbs) and will not support the larger general aviation traffic using the apron. The large aircraft are currently parking in the G.A. apron. These large aircraft leave depressions in the asphalt during the summer months destroying the asphalt. To accommodate the large G.A. itinerant aircraft, an apron expansion should be completed to accommodate aircraft up to 60,000 lbs, or the existing apron overlaid to accommodate the higher aircraft weights.

TABLE 4-11
PAVED TIEDOWN AREA
(SQUARE YARDS)

YEAR	BASED AIRCRAFT TIEDOWNS	AREA FOR BASED AIRCRAFT	ITINERANT AIRCRAFT TIEDOWNS	AREA FOR ITINERANT AIRCRAFT	AREA NEEDED
1990	26	7,800	27	9,720	17,520
1995	29	8,700	28	10,080	18,780
2000	30	9,000	30	10,800	19,800
2010	32	9,600	32	11,520	21,120

Note: Area for based aircraft calculated at 300 square yards per aircraft and for transient aircraft it is calculated at 360 square yards per aircraft.

The increased aircarrier traffic and restraints imposed by FAR 107.14 (security) warranted the construction of a separate G.A. apron adjacent to the passenger terminal for G.A. access in 1992. This provided convenient access to the terminal building for G.A. passengers.

Aircarrier Apron

The existing aircarrier apron provides parking for three (3) 727 or 737's and one (1) commuter at the same time. As the number of large airplanes using the airport increases, the expansion of the apron area will be required. As this area is contiguous with the airport terminal and the direction of terminal expansion controls apron expansion, the specific requirements of the air carrier apron area will be addressed in Chapter 5, Terminal Requirements.

Taxiway and Guidance Signs

The existing taxiway system adequately serves the needs of the airport. The airport includes a full parallel taxiway serving the aircarrier Runway 12-30. At the time that Runway 3-21 is expanded to B-II Standards, a partial parallel taxiway should be constructed to access the threshold of Runway 21. The only other major taxiway improvements required throughout the planning period would be the construction of taxiways in the south hangar area to provide adequate hangar access.

Gallatin Field is in compliance with a recent revision to FAR Part 139 which required the installation of new mandatory, guidance and information signs at "certified" airports. The FAA approved signage plan was completed in 1992 and installation of the new signs is substantially complete, well ahead of the December 31, 1993, deadline.

ARFF Equipment and Requirements

The requirements for Aircraft Rescue and Firefighting (ARFF) are listed in FAR Part 139. New Requirements have been in effect since January 1, 1988. FAR Part 139.315, Aircraft Rescue and Firefighting; Index determination, states that the length of air carrier aircraft determine the Index. Air carrier aircraft lengths are grouped as follows. The length and index of various aircraft are shown on Table 4-12.

Index A: Aircraft less than 90 feet in length;

Index B: Aircraft at least 90 feet but less than 126 feet in length;

Index C: Aircraft at least 126 feet but less than 159 feet in length;

Index D: Aircraft at least 159 feet but less than 200 feet in length; and

Index E: Aircraft at least 200 feet in length.

Table 4-12
ARFF INDEXES

AIRCRAFT	LENGTH	INDEX
McDonnell-Douglas		
MD 81	135'-6"	C
MD 82, 88	135'-6"	C
MD 83	135'-6"	C
MD 87	119'-1"	B
McDonnell-Douglas		
DC-9-15	92'-1"	B
DC-9-21	92'-1"	B
DC-9-32	107'-0"	B
DC-9-41	113'-4"	B
DC-9-51	121'-3"	B
Boeing		
737-200	96'-11"	B
737-300	105'-7"	B
757-200	154'-1"	C
727-100	116'-2"	B
727-200	136'-2"	C

Data from aircraft manufacturer's literature.

The Index which applies to the Gallatin Field Airport is determined by the average daily number of air carrier departures. If there are five or more daily departures of an air carrier aircraft in a single Index group serving the airport, the longest Index group with an average of 5 or more daily departures is required for the airport. If there are less than five average daily departures of air carrier aircraft in a single Index group serving the airport, the next lower Index from the longest Index group with air carrier aircraft in it is the Index required for the airport. The minimum designated Index shall be Index A.

The 727-200 and MD-80 Series aircraft serving the Gallatin Field Airport fall into Index C and because there are more than five scheduled departures per day. The airport is currently Index C.

The forecasts for air carrier operations presented in Chapter 2 indicate that although the number of operations will increase there is no indication of larger aircraft using the airport on a regular basis. Therefore, Gallatin Field is expected to remain in Index C throughout the planning period.

The equipment and agents required by FAR Part 139.317 are:

Index A: requires one vehicle carrying at least 500 pounds of sodium-based dry chemical or halon 1211; or one vehicle carrying 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100 gallons, for simultaneous dry chemical and AFFF foam application;

Index B: requires either one vehicle carrying at least 500 pounds of sodium-based dry chemical or halon 1211, and 1,500 gallons of water, and the commensurate quantity of AFFF for foam production; or two vehicles, one carrying the extinguishing agents specified under the Index A requirements, and one vehicle carrying an amount of water and commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons; and

Index C: requires either two vehicles, one carrying at least 500 pounds of sodium-based dry chemical or halon 1211, 1,500 gallons of water, and the commensurate quantity of AFFF for foam production, and one vehicle carrying water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons; or three vehicles, one carrying the extinguishing agents specified under the Index A requirements, and the remaining two vehicles carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by all three vehicles is at least 3,000 gallons.

At the present time, Aircraft Rescue and Firefighting (ARFF) equipment owned by the Airport Authority includes a 1991 Model T-1500 Oshkosh fire truck with 1500 gallon capacity of water, 200 gallons of aqueous film forming form and 700 lbs. of dry chemical and a 1976 Walters fire truck with 1500 gallon capacity of water, 180 gallons of foam and 500 lbs. of Purple K. The equipment meets the required Index C. Although no additional equipment is required to meet the requirements, the replacement of the Walters fire truck is anticipated during the planning period.

The existing fire station is large enough to provide warm storage for the minimum required ARFF equipment at this time. When additional equipment is purchased, the fire station will require expansion or existing equipment will need to be sold. The existing building includes only minimum office space. A new building or building expansion should include additional office space, training space, and possibly a 360 degree viewing room.

The viewing room may be used as a command post during an emergency or a viewing area for the security officer.

Snow Removal Equipment and Buildings

The existing snow removal equipment and the buildings in which the equipment is housed and maintained are adequate at this time. Through normal replacement of the equipment as it ages, the Airport Authority should be able to provide the required snow removal throughout the planning period. As snow plows are replaced, the plan recommends that the airport personnel review the economics of purchasing larger plows with a 24 foot wide blade. The larger trucks would allow maintenance personnel to clean the large open areas of the runway and taxiways with less effort. One draw back to larger plows is the fact that existing maintenance facilities are not large enough to accommodate the increased plow width. Snow removal equipment and the facilities to house and maintain this equipment should be reviewed continuously and expanded as necessary.

Airport Access Road

The airport is served by one access road from Highway 10, a frontage road between Bozeman and Belgrade. Although the amount of traffic is continuously increasing, an additional access is not required throughout the planning period. The existing road was improved to increase its capacity by adding turn bays and accel/decel lanes at Highway 10 in 1992. Widening the shoulders to meet secondary highway standards is also anticipated. Although the need is not demonstrated at the time of the study to provide a four lane access road, this item should be reviewed in the future as traffic increases.

Old Highway 10 is a narrow secondary highway serving Bozeman and Belgrade. The road does not meet current secondary standards and carries traffic at capacity much of the year. As the traffic to and from the airport increases, the Airport Authority should review the installation of an Interchange at Interstate Highway 90. This improvement has been reviewed in the past, but traffic counts have not yet warranted the expansion.

Storm Water Runoff and Drainage

The Environmental Protection Agency (EPA) recently released the new storm water discharge regulations requiring the aviation industry to comply with the Rule's complicated permit requirements. Airports, along with municipalities and industrial facilities, are required to file for a National Pollutant Discharge Elimination System (NPDES) Permit, either in an individual application or group application form. The Gallatin Airport Authority has filed a group application in conjunction with other AAAE Airport Members. The extremely complex regulation applies to all airports, not just those involved in winter operations and de-

icing activities. The final rule became the law on January 1993 providing no additional extensions are granted.

To obtain a permit, an airport must identify and characterize each outfall, defined as the discharge of storm water runoff from airport property. A preliminary review of the effects the rule will have on Gallatin Field are good because of the existing storm drainage systems in place on airport property. The majority of the storm water runoff is contained and treated on the airport and does not run off to adjacent property.

The airport has three to four probable locations of contamination. The terminal area, G.A. apron area, south hangar area, and the fuel farm. As improvements are completed around the terminal, G.A. apron and south hangars, the construction should include modifications to the storm drainage to include a point discharge of the storm water in each area. Through providing one location of discharge in each of these areas, the airport can easily monitor or treat any contamination. The plan has reviewed the installation of a separate deicing pad to collect any contaminants. Because of the size of the airport, it is felt that allowing operators to deice at the specific gate locations is acceptable at this time. The design of the concrete apron should include full containment of the ramp area with one point discharge.

An open irrigation ditch transfers water from the West Gallatin River to farms north and east of the airport. This ditch passes adjacent to the fuel storage and dispensing area. With growing concerns regarding storm water runoff, the proximaty of the ditch to the fuel and other sources of contamination, a wise course of action would be to install concrete culverts. The enclosure of this waterway into a sealed culvert will protect the environment and reduce the Airport Authorities liability.

III. RECOMMENDED DEVELOPMENTS

Table 4-13 "Development Schedule" identifies the major projects which are considered important to the future development of the Gallatin Field Airport. The cost of the specific improvements and their anticipated schedule is included.

TABLE 4-13
AIRPORT CAPITOL IMPROVEMENT PROGRAM
(1993-2012)
ASSUMES 1992 CONSTRUCTION COSTS PLUS 4% INFLATION

PHASE I 1993-1997	**COST**
1. Runway 3-21 Environmental Assessment	$ 30,000.00
2. Phase I Terminal Expansion	$4,922,000.00
3. Phase II Terminal Expansion	$3,129,000.00
SUBTOTAL PHASE I	$8,081,000.00

PHASE II 1998-2002	**COST**
1. Runway 3-21 Land Acquisition	$ 250,000.00
2. Replace Snow Plows #5 and #6	$ 300,000.00
3. Runway 3-21 construction	$ 240,000.00
4. Front End Loader/Ramp Plow	$ 210,000.00
5. Phase III Terminal Expansion	$3,429,000.00
6. Terminal Apron Expansion (Asphalt)	$ 370,000.00
7. Fire Station Expansion	$ 593,000.00
8. Front End Loader	$ 235,000.00
SUBTOTAL PHASE II	$5,627,000.00

PHASE III 2003-2012	**COST**
1. Terminal Apron Expansion (Concrete)	$3,225,000.00
2. Expand Maintenance Building	$ 750,000.00
3. Access Road and Storm Drainage Improvements	$2,325,000.00
4. Overlay Taxiway System	$2,185,000.00
5. Overlay Runway 12-30	$1,350,000.00
6. Develop Runway 3-21 to BII Standards	$ 950,000.00
7. Extend Runway 12-30 to 10,500	$2,745,000.00
8. Extend Parallel Taxiway	$2,370,000.00
SUBTOTAL PHASE III	$15,900,000.00
TOTAL ESTIMATED COSTS OF PROJECT	**$29,608,000.00**

B:\CHAPTER4
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CHAPTER 5 - TERMINAL AREA FACILITY REQUIREMENTS

I. INTRODUCTION

This chapter represents the analysis of requirements for terminal area facilities at Gallatin Field. Included is a summary of the terminal facilities programming, airport development alternatives, recommended development, and development phasing and costs.

II. METHODOLOGY/FACILITY REQUIREMENTS

The goal of programming an airport facility is to forecast the areas needed to operate an airport terminal. To aid comprehension of terminology used in the preparation of facility forecasts, Table 5-12 has a listing of terms used in this chapter. In determining terminal facilities requirements for Gallatin Field, we began by collecting airport data and reviewing the FAA AC 150/5360-13, PLANNING AND DESIGN GUIDELINES FOR AIRPORT TERMINAL FACILITIES, and AC 150/5360-9, PLANNING AND DESIGN OF AIRPORT TERMINAL FACILITIES AT NON HUB LOCATIONS. This information forms the base of the forecast. Table 5-3, Programmed Facility Requirements, lists the existing facilities at the airport and forecast facility requirements for the twenty-year planning periods: 1995, 2000, 2005, and 2010. For each of the planning periods three columns of data are presented. The first column lists the forecast facility guidelines derived from FAA AC 150/5360-9. The second column lists forecast facility guidelines derived from FAA AC 150/5360-13. And the third column lists the forecast facility requirements developed by the consulting team. This column is identified as "Master Plan."

The column identified as "Plan" lists the actual size of facilities illustrated on the recommended terminal development alternative, Figures 5-10 through 5-12.

It is important to note that the facility guidelines derived from FAA AC 150/5360-9 and 150/5360-13, and listed in Table 5-3, should not be assumed to represent actual facility requirements specific to Gallatin Field. As stated in FAA AC 150/5360-13, the

material contained therein is meant to "provide general guidelines and approximations for determining space and terminal facility requirements for planning purposes."[1] "In addition to historical traffic volumes, each airport has its own combination of individual characteristics to be considered in configuring and sizing terminal facilities. Similarly, each airline serving an airport has internal procedures, policies, and staffing criteria which influence facility planning."[2] "Effective planning and design of the terminal area involve the active participation of airport management, the airlines, concessionaires, and the consultants engaged by the parties."[3] FAA AC 150/5360-9 stresses the same point in paragraph 3, "Use of This Guidance Material," as follows:

> This advisory circular is designed to be used as a general reference by planners. The planning and design of a small terminal building can be complicated since so many factors are involved. The information presented is intended to make the planner aware of the most important considerations, to avoid major errors, and to aid in providing a basis for the development of preliminary studies. The guidelines set forth in this circular cannot take in all factors and may require modification as individual project circumstances dictate.[4]

Where the facility requirements forecast in this Master Plan Update vary from those obtained from the advisory circulars it is because they were derived from more specific data obtained for Gallatin Field through discussions with airport staff, airline representatives, and airport concessionaires. The information gathered is used in a spreadsheet/database which has been developed to incorporate pertinent FAA AC data, specific user input and requirements, and the experience of the consultant team to calculate facility requirements for the required number of gates, departure and arrivals processing activities, public

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1. FAA AC 150/5360-13, 4/22/8, p. 1.
2. Ibid.
3. Op. cit., p. 7.
4. FAA AC 150/5360-9, 4/4/80, p. 1.

TABLE 5-1
DEMAND BASE

YEAR	BASE 1990	1995	2000	2005	2010	DATA SOURCE/DATE
ANNUAL PASSENGERS (PAX)	263,000	337,180	418,100	512,500	606,900	REV. S.B. 8/5/92
PEAK. MONTH: % OF ANNUAL	15.0%	15.0%	15.0%	15.0%	15.0%	REV. S.B. 01/03/92
PEAK MONTH # OF DAYS <31>	31	31	31	31	31	August peak month
COMBINED PK.HR. % OF AVERAGE DAY PEAK MONTH (ADPM)	25.0%	25.0%	20.0%	17.0%	15.0%	REV. S.B. 01/03/92
DEPART. PK. HR. % COMB. PK. HR.	55.0%	55.0%	55.0%	55.0%	55.0%	REV. S.B. 01/03/92
ARRIV. PK. HR. % of COMB. PK. HR.	55.0%	55.0%	55.0%	55.0%	55.0%	REV. S.B. 01/03/92
PEAK HR. PASSENGER PROFILE						
% PAX ENPLANEMENTS ORIGINATING	98.0%	98.0%	98.0%	98.0%	98.0%	REV. S.B. 01/03/92
ORIGINATING PAX: % TICKETING	95.0%	95.0%	95.0%	95.0%	95.0%	VER. S.B. 01/03/92
ORIGINATING PAX: % GATE CK-IN	5.0%	5.0%	5.0%	5.0%	5.0%	VER. S.B. 01/03/92
% PAX DEPLANEMENTS TERMINATING	90.0%	90.0%	90.0%	90.0%	90.0%	REV. S.B. 01/03/92
TERMINATING PAX: % CLAIMING	80.0%	80.0%	80.0%	80.0%	80.0%	REV. S.B. 01/03/92
TERMINATING PAX: % BYPASS CLAIM	20.0%	20.0%	20.0%	20.0%	20.0%	REV. S.B. 01/03/92
% TRANSFER PAX: COMBINED PK. HR.	2.0%	2.0%	2.0%	2.0%	2.0%	REV. S.B. 01/03/92
% INTRALINE TRANSFERS	100.0%	100.0%	100.0%	100.0%	100.0%	
% INTERLINE TRANSFERS	0%	0%	0%	0%	0%	
WELLWISHERS PER PAX RATIO	0.33	0.33	0.33	0.33	0.33	VER. S.B. 01/03/92
GREETERS PER PAX RATIO	0.33	0.33	0.33	0.33	0.33	VER. S.B. 01/03/92
BAGS PER PAX	2.50	2.50	2.50	2.50	2.50	VER. S.B. 01/03/92
BOARDING LOAD FACTOR PK.HR.	30.20%	29.50%	30.10%	31.30%	31.75%	Derived
ANNUAL OPERATIONS	13,799	20,008	27,045	33,764	40,854	Derived from Table 2-20 Gallatin Field MPU.
PK. MONTH OPS. % OF ANNUAL	10.0%	9.8%	9.5%	8.8%	8.0%	VER. S.B. 01/03/92
PEAK MONTH # OF DAYS <31>	31	31	31	31	31	August peak month
PEAK HOUR OPS: % ADPM	9.0%	8.1%	7.7%	6.8%	6.5%	VER. S.B. 01/03/92
PEAK HR. OPERATIONS PROFILE						
COMBINED OPS % OF DAILY	10.00%	9.66%	9.33%	9.00%	8.33%	TRA assumption that ops will increase at faster rate in non peak hour.
CARRIER (DWELL TIME, # SEATS)						
B 727 (30, 120)	28.75%	28.75%	28.75%	28.75%	28.75%	VER. S.B. 01/03/92
DC 9, B737 (30, 100)	28.75%	28.75%	28.75%	28.75%	28.75%	VER. S.B. 01/03/92
TOTAL	57.5%	57.5%	57.5%	57.5%	57.5%	
COMMUTER						
Metro (20, 20)	21.25%	21.25%	21.25%	21.25%	21.25%	VER. S.B. 01/03/92
EMB (20, 19)	21.25%	21.25%	21.25%	21.25%	21.25%	VER. S.B. 01/03/92
TOTAL	42.50%	42.50%	42.50%	42.50%	42.50%	
GATE OCCUPANCY FACTOR	47.7%	51.1%	54.0%	48.3%	51.0%	Derived

Source: TRA Airport Consulting.

DATE 05-Aug-92
DATE 18-Nov-92

TABLE 5-2
PASSENGER AND OPERATIONS DEMAND DISTRIBUTION

YEAR	1990	1995	2000	2005	2010
ANNUAL PASSENGERS (PAX)	263,000	337,180	418,100	512,500	606,900
PEAK MONTH (PK. MO.) PASSENGERS	39,450	50,577	62,715	76,875	91,035
%PK. MO. PAX/ANNUAL PAX	15%	15%	15%	15%	15%
AVG. DAY PK. MO. (ADPM) PASSENGERS	1,273	1,632	2,023	2,480	2,937
PEAK HOUR (PK. HR.) PASSENGERS					
COMBINED PK. HR. PAX	318	408	405	422	440
DEPARTING PK. HR. PAX (ENPLANING)	175	224	223	232	242
ARRIVING PK. HR. PAX (DEPLANING)	175	224	223	232	242
PEAK HR. PASSENGERS & VISITOR PROFILE					
DEPARTING PK. HR. PAX ORIGINATING	171	220	218	227	237
# TICKETING	163	209	207	216	226
# GATE CK-IN	9	11	11	11	12
ARRIVING PK. HR. PAX TERMINATING	157	202	200	209	218
# CLAIMING	126	162	160	167	174
# BY-PASS CLAIM	31	40	40	42	44
DEPARTING PK. HR. PAX TRANSFERRING	3	4	4	5	5
# INTRALINE	3	4	4	5	5
DEPARTING PK. HR. # WELLWISHERS	57	73	72	75	78
ARRIVING PK. HR. # GREETERS	52	67	66	69	72
PEAK HOUR BAGGAGE					
DEPARTING: FROM TICKETING	326	522	518	540	564
ARRIVING: TO BAGGAGE CLAIM	252	404	401	417	436
DEPARTING: TRANSFER BAGGAGE	7	11	11	12	12
BOARDING LOAD FACTOR PK.HR.	30.20%	29.50%	30.10%	31.30%	31.75%
ANNUAL OPERATIONS	13,799	20,008	27,045	33,764	40,854
PEAK MONTH (MO.) OPERATIONS	1,380	1,961	2,556	2,954	3,268
AVG. DAY PK. MO. (ADPM) OPERATIONS	45	63	82	95	105
COMBINED PK. HR. OPERATIONS	4	6	6	6	7
PEAK HOUR OPERATIONS PROFILE					
AIR CARRIER PK. HR. OPERATIONS:					
B 727	1.15	1.72	1.83	1.86	1.97
DC 9	1.15	1.72	1.83	1.86	1.97
COMMUTER PK. HR. OPERATIONS:					
Metro	0.85	1.28	1.35	1.38	1.46
EMB	0.85	1.28	1.35	1.38	1.46
TOTAL OPERATIONS PEAK HOUR	4	6	6	6	7

Source: TRA Airport Consulting.

DATE 05-Aug-92
DATE 18-Nov-92

spaces such as seating and toilet rooms, concessions, and building services including airport administration and mechanical and electrical spaces based on processing rates for passengers and operational activities. As an example, the spreadsheet has been constructed to calculate the required length of ticket counter and associated queue length based on the average time it takes a ticket agent to complete the ticketing process combined with the number of passengers to be processed and an acceptable number of passengers waiting to be ticketed per agent.

Table 5-1 lists the base data for demand for the year 1990 and projections of that data over the planning period. Table 5-2 uses the percentages shown in Table 5-1 to establish numbers for passengers, gates, and operations.

The facility requirements shown on Table 5-3 also contain utilization level columns for existing or "Actual" facilities and a second column for optimum or "Design" utilization. Both columns are based on utilization for the Average Day of the Peak Month (ADPM) for the planning period. The Actual Utilization Level column estimates the existing usage as a percentage of the total available capacity. The Design Utilization Level column expresses a utilization factor that accommodates forecast user demand yet provides some additional capacity to accommodate higher peak conditions. This is desirable because ADPM is not a worst-case condition. The closer the percentages are to 100 percent, the closer the facility is being used to its capacity and the more congested or constrained the activity will be. Design utilization levels should be in the 65 to 80 percent range, depending on the specific facility, to allow for higher peak conditions and to act as a buffer in the event of earlier-than-expected growth in passenger volumes.

Three peak activity conditions (shown on Table 5-2) are used as input to calculate projected facility requirements (shown on Table 5-3). Peak hour departures are used to determine departure processing activities such as ticketing, security screening, outbound baggage processing and gate holdroom facilities. Peak hour arrivals are used to determine arrivals processing activities, including the number and size of claim devises, claim lobby size and inbound baggage handling areas. The combined peak, usually the largest peak of the day, is used to determine requirements for toilet rooms, circulation and concession spaces.

Gate requirements are determined by an evaluation of the future gate activity by forecasting aircraft mix and dwell time of aircraft types, to establish the percentage of time that a gate is occupied. For example, if a two gate airport had a peak hour of two operations, (one arrival and one departure) and an aircraft occupied one gate for 30 minutes of the possible 120 minutes, then the Gate Occupancy Factor for the peak hour would be 25%. A factor of 50% is more typical and indicates a high usage of gates.

As an element of the facilities forecasting methodology, interviews were held with the airport staff, the airlines, and concessionaires concerning future facility requirements. Through these interviews, several specific areas of concern surfaced and have been addressed in the establishment of facilities requirements, in the generation of airport development alternatives, and the establishment of a recommended alternative. The following is a list of these concerns and a brief discussion of each.

- Security screening and queues
- Width of ticketing lobby/airline space
- Location of mechanical revolving door
- Location and size of restaurant and kitchen
- Need for enclosed ramp equipment storage areas
- Desire for recirculating claim conveyor or claim device
- Rental car concessions

Security Screening and Queues

The FAA's implementation of security screening of all passengers has caused significant congestion in the second-floor lobby at Gallatin Field during peak periods, as passengers queue prior to being screened. This condition is aggravated by the lack of sufficient space for greeters on the second floor. As a

result, both functions are forced to occur simultaneously in the small lobby area at the head of the main stair connecting the first and second floors. At times, due to the limited space available, passengers are forced to queue on this stair, impacting the ability of passengers and other building occupants to circulate between floors, and blocking access to the airport offices as well.

Width of Ticketing Lobby

Another area of congestion during peak periods is the existing ticketing lobby. The overall depth of the lobby is approximately 23 feet, 3 inches, with an assumed ticketing queue depth of 13 feet, 9 inches. Subtracting the queuing depth from the overall depth leaves approximately 9 feet, 6 inches for general circulation behind the queue. In the area of the revolving entry doors, this circulation width is further restricted to a width of approximately 5 feet.

In addition to the limited space available in the ticket lobby, the airlines have expressed the need for additional airline ticket office (ATO) space and for additional space in the baggage make-up areas.

Location of Mechanical Revolving Doors

As indicated above, the location of the existing revolving door in the ticketing lobby impacts the area available for circulation behind the ticketing queue.

Location and Size of Restaurant and Kitchen

The existing restaurant, lounge, and kitchen have been identified as being too small to accommodate existing demand. The restaurant, while having excellent visual access to the apron area and aircraft activity, and the lounge are perceived as being difficult to locate from the public lobby and seating areas. The lounge is also poorly situated with respect to visually stimulating views.

Delivery access to the kitchen has also been identified as a problem. Currently the kitchen must be serviced from the passenger curb in front of the terminal. This requires that

deliveries be made at non-peak periods or in the evening or early morning, otherwise the use of the curb by arriving and departing passengers is impacted.

Need for Enclosed Ramp Equipment Storage Areas

Due to the severe winter conditions experienced at Gallatin Field, the airlines have expressed the need for enclosed and heated storage areas for ramp equipment and baggage carts.

Desire for Recirculating Claim Conveyor or Claim Device

Currently there are three bag slides from which passengers claim their baggage. Each slide is approximately 17 feet long. If bags are not claimed quickly by passengers, the slides fill up, making display of additional bags difficult. When this occurs, bags tend to be removed and placed on the floor adjacent to the slide, making access to the slide more difficult. Also, as passengers gather around one slide, it impacts the ability of another carrier to use an adjacent slide.

The airlines have expressed the desire for at least one recirculating conveyor or claim device.

Rental Car Concessions

Rental car concessionaires expressed the need for more space, specifically more office and storage space. Within this expanded space there was also a request for more electrical outlets and telephone connections. Another comment included the need for lower ceilings in the rental car spaces to cut down on the volume of space which must be heated and cooled.

It was also expressed that the existing counters were too small. Currently the counters are 8 feet long. General consensus was that the counters need to be 15 feet long.

Table 5-3 lists the existing facilities available at Gallatin Field and the facility requirements established for each of the planning periods.

TABLE 5-3
PROGRAMMED FACILITY REQUIREMENTS

	UNITS	ACTUAL UTIL. LEVEL 1990		DESIGN UTIL. 1990	LEVEL	PLAN	1995 150/5360-9*	1995 150/5360-13*	1995 Master Plan	2000 150/5360-9	2000 150/5360-13	2000 Master Plan	2005 150/5360-9	2005 150/5360-13	2005 Master Plan	2010 150/5360-9	2010 150/5360-13	2010 Master Plan
AIRCRAFT OCCUPANCY FACTOR		47.7%					—	—	51.1%	—	—	54.0%	—	—	48.3%	—	—	51.0%
PEAK HOUR OPERATIONS	Ops.	4		4			—	—	6	—	—	6	—	—	6	—	—	7
GATE POSITIONS																		
JET GATES: (B 727, D-9, B 737)	#	3		3			4	6	4	4	7	4	4/5	8	4	4/5	8	4
COMMUTER GATES: (METRO, EMB)	#	2		2			—	—	3	—	—	3	—	—	4	—	—	4
Total Gate Positions	#	5		5			4	6	7	4	7	7	4/5	8	8	4/5	8	8
DEPARTURE PROCESSING																		
Departure Peak Hour: Ticketed PAX	PAX	163	182	163			—	—	209	—	—	207	—	—	216	—	—	226
Ticket Counter Frontage	L.F.	66		104		104	47-59	45-70	108	47-58	50-75	108	48-60	70-100	112	50-62	70-100	117
# Agent Positions	#	11	89.8%	16	67.0%		—	—	17	—	—	17	—	—	18	—	—	18
Ticket Counter Area	S.F.	623		962		1,168	376-472	450-700	1,023	376-464	500-750	1,015	384-480	700-1000	1,057	400-496	700-1000	1,105
Departure Pk. Hour: PAX + Wellwishers	people	217		217			—	—	278	—	—	276	—	—	287	—	—	300
Departure Peak Period: PAX in Queue		87		87			—	—	42	—	—	41	—	—	43	—	—	45
Ticket Lobby: Queuing Area	S.F.	1,090	48.6%	1,090		4,133	950-1175	4,200	3,469	950-1175	4,250	3,440	980-1225	5,000	3,585	1025-1260	5,000	3,746
Ticket Lobby: Circulation Area	S.F.	940		1,481		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Airline Ticket Offices (ATO)	S.F.	2,212		2,080		9,120	4250-5200	2500-3550	8,070	4250-5200	3350-4400	7,827	4445-5300	4250-4700	8,450	4600-5500	4250-4700	9,082
Outbound Baggage Processing Area	S.F.	3,094		5,902		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Airport/Airline Ops. (unassigned)	S.F.	N.A.				9,000	↓	1,500	9,000	↓	1,500	9,000	↓	1,500	9,000	↓	1,750	9,000
Total thru Security Checkpoint	people	204	600				—	—	262	—	—	260	—	—	270	—	—	283
Security Stations	#	1	34.0%	1		1	1	1	1	1	1	1	1	1	1	1	1	1
ARRIVALS PROCESSING																		
Pk Hr PAX to Baggage Claim	PAX	126	386				—	—	162	—	—	160	—	—	167	—	—	174
Pk Hr Bags to Claims Device	Bags	252	155				—	—	404	—	—	401	—	—	417	—	—	436
Baggage Claim:								—	52		—	51		—	55		—	134
Device Frontage	L.F.	51	16.3%	104	80.0%	280	41-51	150	167	41-51	160	165	42-52	162	172	43-55	166	263
# Devices	#	1		1		2	—	—	1	—	—	2	—	—	2	—	—	2
Total Pk Hr: people at Bag. Claim	people	177	228	177			—	—	227	—	—	226	—	—	235	—	—	246
Claim Lobby Area	S.F.	1,128	77.9%	1,128		8,679	1190-1410	5000-5500	3,331	1180-1400	5300-6000	8,679	1210-1450	5300-6000	8,679	1250-1475	5750-6250	8,679
Inbound Baggage Processing Area	S.F.	1,159		1,159		4,724	1,357	1700-2150	2,000	4,010	1750-2250	4,000	4,010	1750-2250	4,000	4,010	1750-2300	4,000
GATE FACILITIES																		
Depart. Pk. Hr .PAX + Wellwishers	people	228	312				—	—	292	—	—	290	—	—	302	—	—	316
Passenger Holdrooms	S.F.	4,051	73.2%	4,051	73.2%	6,857	3,186	2300	5,160	3,251	2300	5,119	3,506	2300	5,333	3,556	2725	5,573
Observation Lounge	S.F.	1,931		1,931		1,280	—	—	1,280	—	—	1,280	—	—	1,280	—	—	1,280
PUBLIC SPACES																		
Combined Pk Hr: Total Terminal Users	people	427	427				—	—	547	—	—	543	—	—	565	—	—	591
Public Seating	S.F.	911		911		12,661	2700-3300	3000-3600	13,538	2700-3300	3000-3500	14,072	2800-3500	3100-3700	14,818	3000-3600	3150-3750	15,559
Public Lobby	S.F.	5,033		5,033		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Rest Rooms	S.F.	878		878		3,898	—	1,469	1,126	—	1,458	1,117	—	1,520	1,163	—	1,800	1,216

Continued on next page

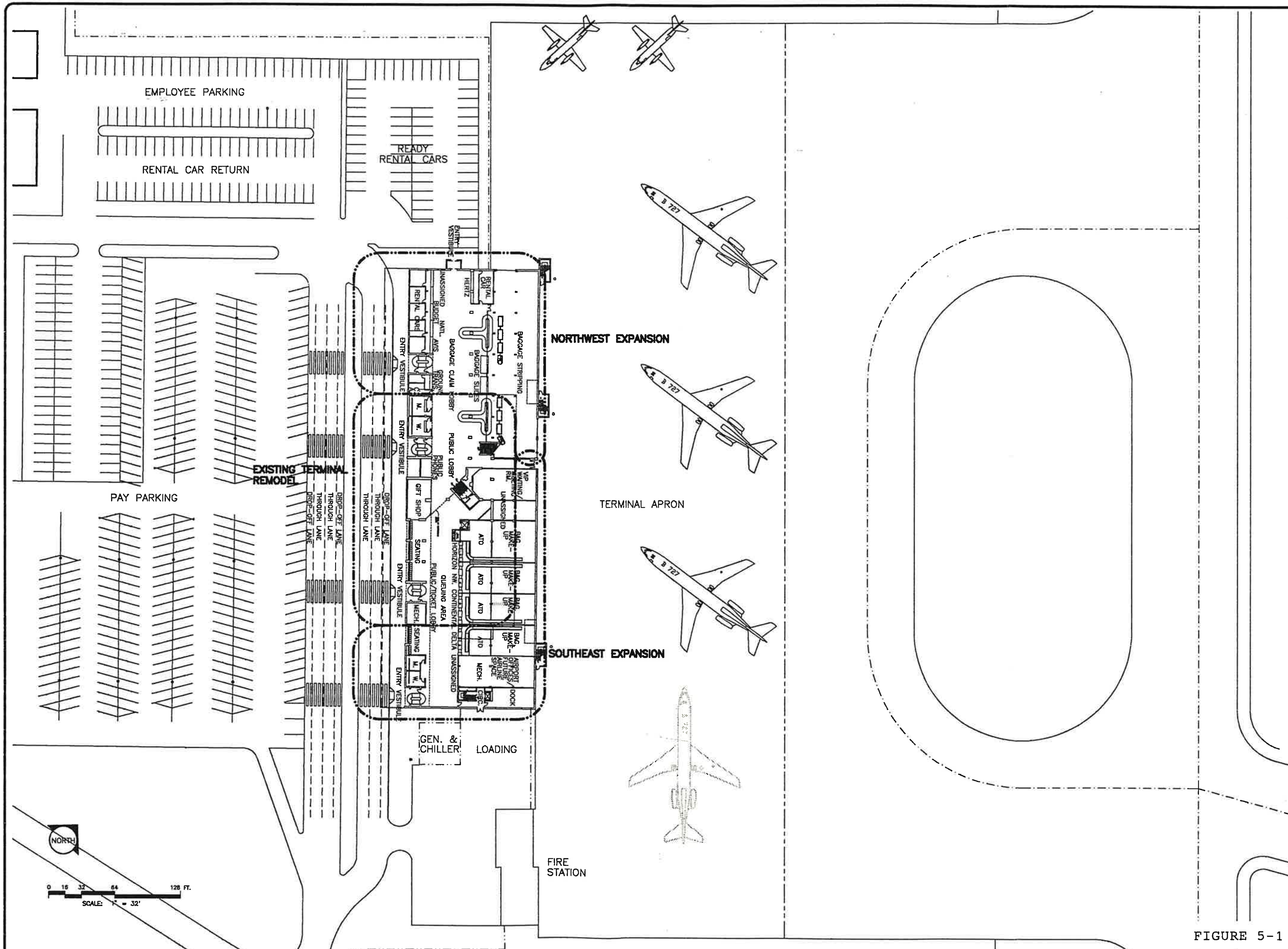
TABLE 5-3 (cont.)
PROGRAMMED FACILITY REQUIREMENTS

	UNITS	ACTUAL UTIL. LEVEL 1990	1990	DESIGN UTIL. 1990	LEVEL	PLAN	1995 150/5360-9*	1995 150/5360-13*	1995 Master Plan	2000 150/5360-9	2000 150/5360-13	2000 Master Plan	2005 150/5360-9	2005 150/5360-13	2005 Master Plan	2010 150/5360-9	2010 150/5360-13	2010 Master Plan
CONCESSIONS																		
1/2 ADPM PAX	PAX	636	1,273				---	---	816	---	---	1,012	---	---	1,240	---	---	1,468
Restaurant/Snack Dining Areas	S.F.	759		3,272		6,033	2250-3010	5,062	4,000	2250-3010	5,123	4,883	2370-3250	5,398	6,162	2400-3350	5,459	7,218
Food Preparation Areas	S.F.	304																
Cocktail/Bar Areas	S.F.	659																
Ground Transportation	S.F.	206																
Misc. Retail Concessions	S.F.																	
Lockers, Games, Vending	S.F.	164																
Gift and News	S.F.	404																
Rental Car Counters & Offices	S.F.	666		960		2,531	192	408	1,800	192	504	1,800	288	624	1,800	288	720	2,531
BUILDING SERVICES: Admin & Maint.																		
Airport Offices	S.F.	614		614		2,244	---	---	2,244	---	---	2,244	---	---	2,244	---	---	2,244
VIP/Meeting Room	S.F.	N.A.				1,819	---	---	1,819	---	---	1,819	---	---	1,819	---	---	1,819
Janitor	S.F.	119		119		119	---	---	120	---	---	122	---	---	123	---	---	125
Loading Dock	S.F.	426		426		815	---	---	815	---	---	815	---	---	815	---	---	815
unassigned	S.F.	---		---		3,203	---	---	---	---	---	---	---	---	---	---	---	---
Building Mechanical Systems	S.F.	10,219		375		700	4729-5242	6549-7062	10,394	5269-5781	6826-7366	10,394	5428-5971	7260-7719	11,692	5586-6127	7550-7982	11,692
GENERAL CIRCULATION	S.F.	1,193		1,193		9,938	5254-5824	7276-7846	5,535	5855-6423	7585-8185	5,405	6031-6634	8066-8576	5,400	6207-6808	8389-8869	6,122
TOTAL PROGRAM AREAS	S.F.	30,069		32,721		85,340	31000-34362	42930-46293	69,189	34542-37897	44749-48289	77,626	35582-39141	47591-50600	82,018	36621-40168	49494-52326	85,684
TOTAL TERMINAL AREA	Gross S.F.	35,073		38,186		95,278	36254-40186	50206-54139	74,724	40397-44320	52334-56474	83,031	41613-45775	55657-59176	87,418	42828-46978	57883-61195	91,808

* AC 150/5360-9 "Planning and Design of Airport Terminal Facilities at Nonhub Locations", 4/4/80.
** AC 150/5360-13 "Planning and Design Guidelines for Airport Terminal Facilities", 4/22/88.

Source: TRA Airport Consulting.

DATE 05-Aug-92
DATE 18-Nov-92
DATE 09-Mar-93



SITE PLAN ALTERNATIVE ONE APRON LEVEL

Morrison Maierle/CSSA Inc.
TRA Airport Consulting

PROJECT NUMBER 54270.01

FIGURE 5-1

EMPLOYEE PARKING

RENTAL CAR RETURN

READY RENTAL CARS

PAY PARKING

EXISTING TERMINAL REMODEL

NORTHWEST EXPANSION

SOUTHEAST EXPANSION

TERMINAL APRON

B 727

B 727

B 727

B 727

DROP-OFF LANE

THROUGH LANE

THROUGH LANE

THROUGH LANE

THROUGH LANE

CANOPY

BAGGAGE CLAIM LOBBY

GATE LOBBY

SECURITY 40' QUEUE

GREETERS LOBBY

SECURITY OFFICE

RESTAURANT

GATE LOBBY

KITCHEN

CIRC.

UNASSIGNED

TICKETING LOBBY BELOW

GEN. & CHILLER

LOADING

FIRE STATION

NORTH

0 16 32 64 128 FT.

SCALE: 1" = 32'

FIGURE 5-2

SITE PLAN
ALTERNATIVE ONE CONC. LEVEL

Morrison/CSSA

ENGINEERS PLANNERS SURVEYORS

P.O. Box 1113
601 Haggerty Lane
Bozeman, MT 59771-1113
Phone (406) 587-0721

315 Columbia
Seattle, WA
(206)682-1153

PROJECT NUMBER 54270.01

SHEET NUMBER

with gate lobby space is provided for commuter airlines. Toilet rooms are provided adjacent to the gate lobbies. These passenger facilities are accessed via the second floor (concourse level) by a central stair and elevator. Commuter aircraft are parked around this commuter passenger facility. Passengers would access aircraft directly from this facility on grade.

A service road would be constructed around the outside perimeter of the aircraft parking apron.

At the concourse level the pier provides access to the jet aircraft boarding gates and to the commuter passenger facility. Four jet aircraft and four commuter aircraft would be accommodated around the two-level concourse.

The gate lobbies for the jet aircraft would be located in the expanded terminal building, remote from the actual boarding gates.

Alternative Two is illustrated in Figures 5-3 and 5-4.

A preliminary Cost estimate for Alternative Two is shown on Tables 5-6 and 5-7.

Alternative Three

Alternative Three expands the existing terminal building similarly to that described for Alternative One. Commuter aircraft are parked in a linear manner along the northeast face of the expanded terminal building, while the larger jet aircraft are parked around a new two-level concourse which extends to the northeast approximately 320 feet.

At apron level the concourse provides space for airport use and airline operations and equipment storage. Blast fences would be constructed on both sides of the concourse to protect the inboard commuter aircraft from jet blast when the larger jet aircraft power out.

A service road would be constructed around the outside perimeter of the aircraft parking apron.

EMPLOYEE PARKING

RENTAL CAR RETURN

READY RENTAL CARS

TERMINAL APRON

PAY PARKING

EXISTING TERMINAL REMODEL

NORTHWEST EXPANSION

PIER EXPANSION

SOUTHEAST EXPANSION

SERVICE ROAD

AIRLINE OPERATIONS SPACE

COMMUTER HOLD AREA

ENTRY VESTIBULE

RENTAL CAR

HERTZ

UNASSIGNED

BUDGET

NATL

AVIS

RENTAL CARS

BAGGAGE CLAIM LOBBY

BAGGAGE SLIDES

BAGGAGE STRIPPING

PUBLIC LOBBY

PUBLIC PHONES

M.

W.

GIFT SHOP

VIP WAITING/ MEETING RM.

UNASSIGNED UP

ATO

BAG. MAKE-UP

SEATING

MECH.

PUBLIC/TICKET LOBBY

QUEUING AREA

HORIZON NW, CONTINENTAL, DELTA UNASSIGNED

AIRPORT OFFICES/ AIRLINE SPACE

DOCK

DROP-OFF LANE

THROUGH LANE

GEN. & CHILLER

LOADING

FIRE STATION

B 727

NORTH

0 16 32 64 128 FT.

SCALE: 1" = 32'

FIGURE 5-3

SITE PLAN
ALTERNATIVE TWO
APRON LEVEL

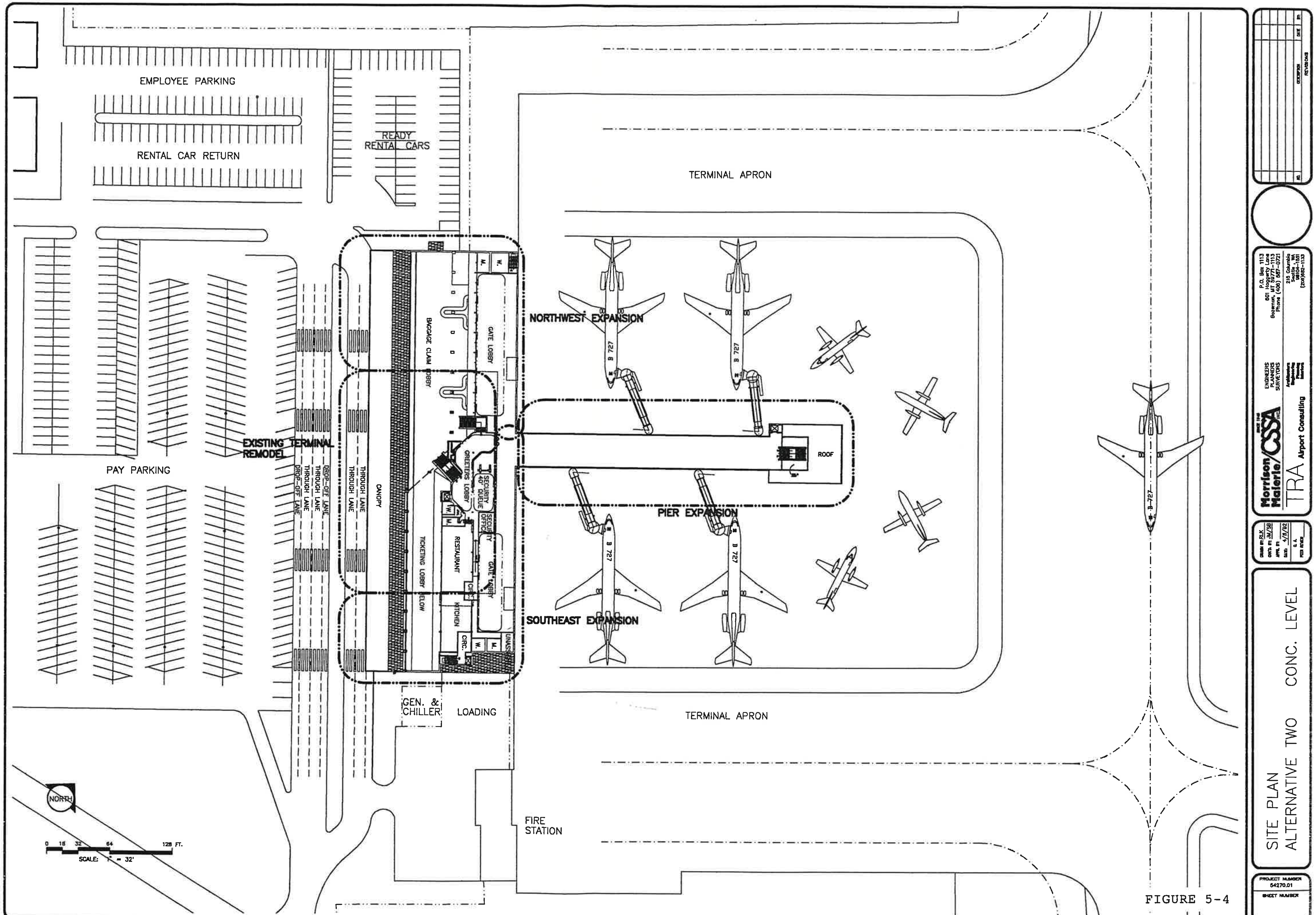
Morrison/Maierle/CSSA Inc.
ENGINEERS PLANNERS SURVEYORS
P.O. Box 1113
601 Technology Blvd.
Bozeman, MT 59771-1113
Phone (406) 587-0721
215 Columbia
Helena, MT
59624-1581
(406)442-1133

TRA Airport Consulting

DRAWN BY: RLK
DATE: 1/24/92
SCALE:

PROJECT NUMBER

SHEET NUMBER



EMPLOYEE PARKING
RENTAL CAR RETURN
READY RENTAL CARS
TERMINAL APRON
PAY PARKING
EXISTING TERMINAL REMODEL
DROP-OFF LANE
THROUGH LANE
THROUGH LANE
DROP-OFF LANE
THROUGH LANE
THROUGH LANE
CANOPY
BAGGAGE CLAIM LOBBY
GATE LOBBY
GREETERS LOBBY
SECURITY 40' QUEUE
SECURITY OFFICE
TICKETING LOBBY BELOW
RESTAURANT
KITCHEN
CIRC.
CIRC.
UNASS.
W.
M.
NORTHWEST EXPANSION
PIER EXPANSION
SOUTHEAST EXPANSION
ROOF
B 727
GEN. & CHILLER
LOADING
FIRE STATION
NORTH
0 16 32 64 128 FT.
SCALE: 1" = 32'
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ENGINEERS PLANNERS SURVEYORS
TRA Airport Consulting
SITE PLAN ALTERNATIVE TWO
CONC. LEVEL
PROJECT NUMBER 54270.01
SHEET NUMBER
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FIGURE 5-4

At the concourse level the pier provides gate lobby space for four jet aircraft, toilet rooms, building service facilities, and concession space.

Gate lobbies for the commuter passengers would be located on the second floor of the terminal building in the general location of the existing gate lobbies. Commuter passengers would be directed to stairs and an elevator to board commuter aircraft on the apron. All jet aircraft would be boarded via concourse-level loading bridges.

The security station, as in Alternatives One and Two, would be reoriented and expanded to minimize conflicts with other functions.

Space on the concourse level of the expanded terminal building not required for commuter gate lobbies, or restaurant/lounge use, would be available for currently unassigned airport or airline uses.

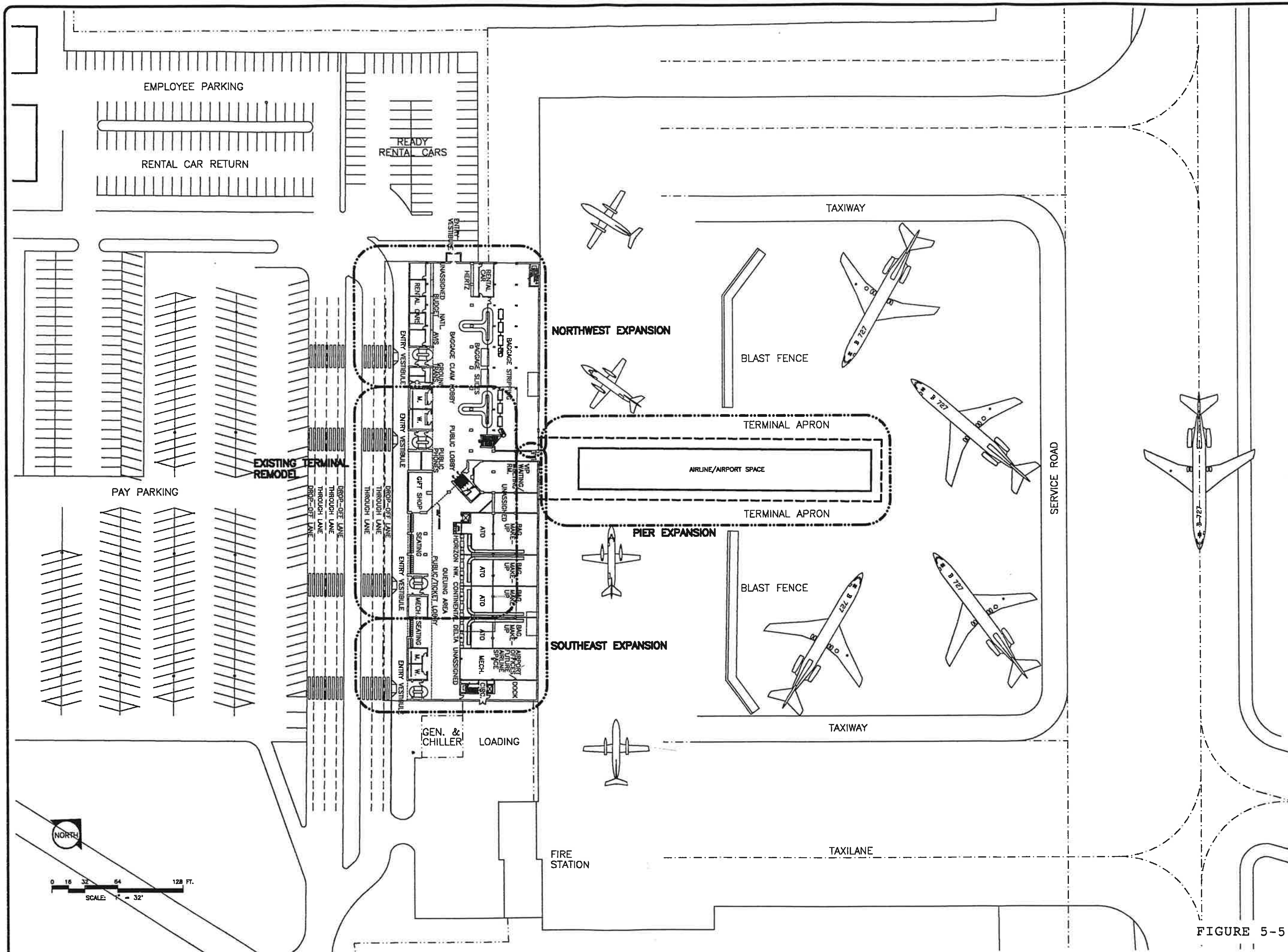
Figures 5-5 and 5-6 illustrate Development Alternative Three.

A preliminary cost estimate for Alternative Three is shown on Table 5-8 and 5-9.

Alternative Four

Alternative Four is somewhat similar to Alternatives Two and Three in that it also employs the pier development concept. However, there are significant differences in the expansion of the existing terminal building.

In this alternative the ticketing end of the existing terminal building is expanded approximately 80 feet, similar to the previous three alternatives. At the apron-level ticket counters, airline ticket offices, and baggage make-up space is provided for four independent carriers and for the combined commuter carriers. The expansion also provides additional public seating, toilet rooms, and entry vestibule. Also expanded are the passenger curb, gift shop, and dock area. The ticketing lobby is enlarged, as discussed in Alternative One, to create additional queuing and circulation space.



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SITE PLAN
ALTERNATIVE THREE
APRON LEVEL

PROJECT NUMBER

SHEET NUMBER

FIGURE 5-5

EMPLOYEE PARKING

READY RENTAL CARS

RENTAL CAR RETURN

TAXIWAY

TERMINAL APRON

NORTHWEST EXPANSION

BLAST FENCE

EXISTING TERMINAL REMODEL

PAY PARKING

BAGGAGE CLAIM LOBBY

GATE LOBBY

CANOPY

THROUGH LANE

DROP-OFF LANE

GREETERS LOBBY

SECURITY QUEUE

SECURITY OFFICE

RESTAURANT

GATE LOBBY

TICKETING LOBBY BELOW

KITCHEN

CIRC.

W.

M.

DNASS

SERVICE ROAD

PIER EXPANSION

BLAST FENCE

SOUTHEAST EXPANSION

TERMINAL APRON

TAXIWAY

GEN. & CHILLER

LOADING

FIRE STATION

TAXILANE

B 727

121

NORTH

0 16 32 64 128 FT.

SCALE: 1" = 32'

FIGURE 5-6

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216 Columbia
Kalispell, MT
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Architecture Planning Survey Design
TRA Airport Consulting

DESCRIPTION REVISIONS DATE BY

SHEET NUMBER

PROJECT NUMBER

SITE PLAN
ALTERNATIVE THREE CONC. LEVEL

On the second floor (concourse level) the face of the existing terminal building is not relocated to the northeast 21 feet as on the first floor, but remains in its current location. The area which is currently gate lobby space houses an observation lounge. The space which is currently the observation lounge becomes the restaurant.

The security station is relocated from its current location to the concourse, and the airport offices are relocated to the first floor. The resulting space is used to expand the greeters lobby and eliminate functional conflicts.

The new area added to the end of the terminal would be constructed out the additional 21 feet. Functions housed in this area include the kitchen, vertical circulation and service access to the kitchen, toilet rooms, and a cocktail lounge with visual access to the apron and views beyond.

The opposite (baggage claim) end of the building is expanded 121 feet, 6 inches to the northwest. Alternative Four does not, however, expand this end of the terminal building at either the first or second floors to the northeast 21 feet.

At the apron level the baggage claim lobby is expanded and houses two recirculating claim conveyors and two of the existing bag slides.

The rental car and ground transportation spaces have been expanded with room for two additional rental car concessions.

Adjacent to the existing toilet rooms an infant change area has been provided.

The baggage stripping area is also significantly increased to support the new claim conveyors. Since the building is not expanded to the northeast 21 feet as in the previous alternatives, the baggage stripping area is not as deep. As a result, equipment storage will not be possible in this area.

Adjacent to the curb a new entry vestibule with revolving doors has been added. On the northwest end of the expanded terminal building a secondary entry/exit vestibule is provided with electric sliding doors. As in the previous alternatives, an

additional stair has been provided between the first and second floors. The existing stair would provide access up to the second level, while the new stair would be used primarily to circulate down to the bag claim and public lobbies.

On the second floor, the added area and the area currently used as gate lobby space would be available for currently unassigned airport or airline uses.

In Alternative Four both commuter and air carrier aircraft are parked around a new two-level pier or concourse. This concourse extends to the northeast approximately 276 feet.

At the apron level, the concourse provides space for airport use, airline operations, and equipment storage.

A service road would be constructed around the outside perimeter of the aircraft parking apron.

At the concourse level, the pier would house the relocated security station and queue and an office for security staff. Additional functions that would be accommodated include toilet rooms, building services, and gate lobbies for both commuter and national air carrier aircraft.

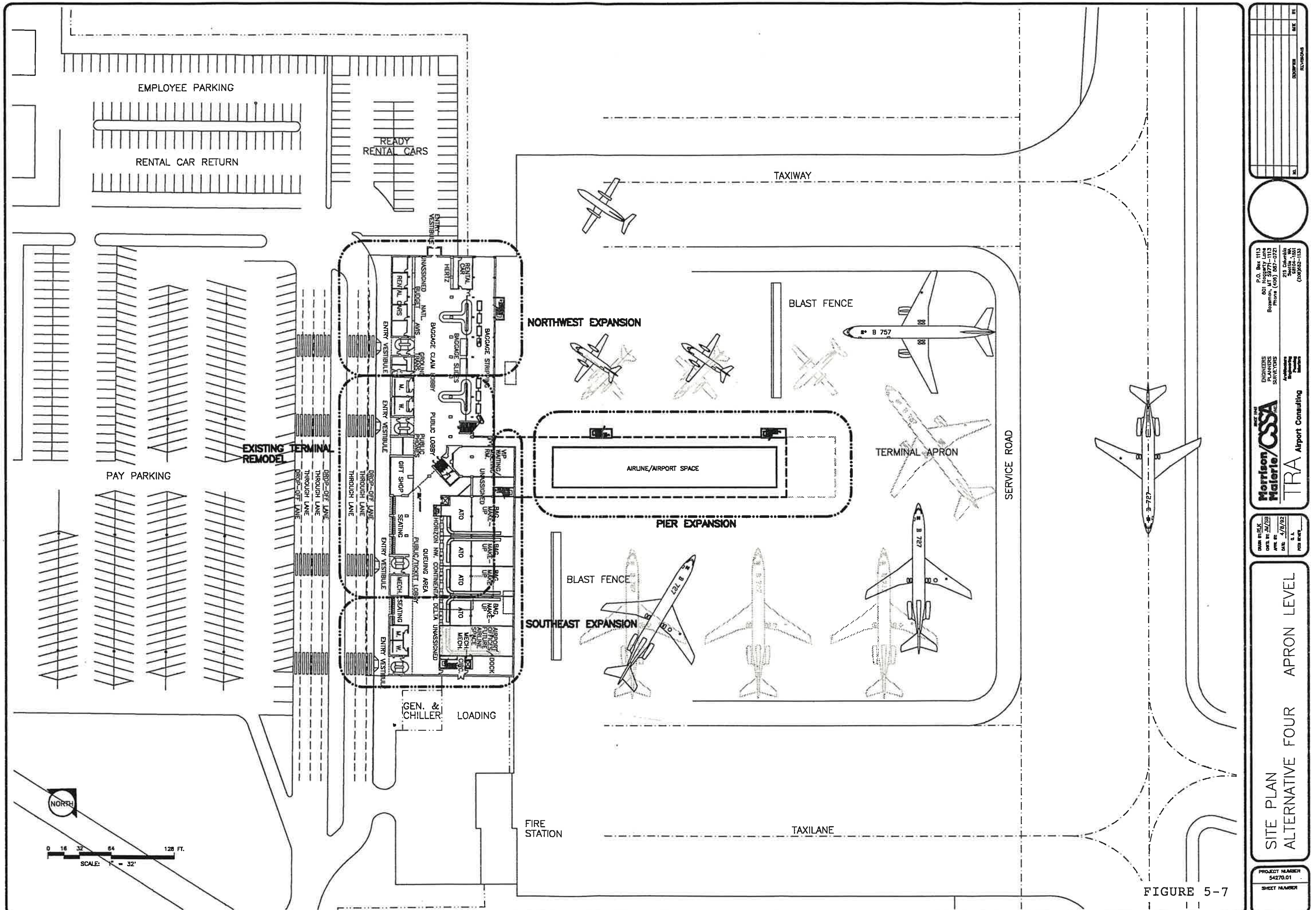
Three gate lobbies would be provided for jet aircraft, and one gate lobby would be provided for the combined commuter carriers. Commuter passengers would be directed to stairs and an elevator to board commuter aircraft on the apron. All jet aircraft would be boarded via concourse-level loading bridges.

Figures 5-7 and 5-8 illustrate Development Alternative Four.

A preliminary cost estimate for Alternative Four is shown on Tables 5-10 and 5-11.

IV. TERMINAL DEVELOPMENT ALTERNATIVES EVALUATION

In this section the terminal development alternatives presented in the previous section are evaluated and a recommended alternative selected.



EMPLOYEE PARKING
RENTAL CAR RETURN
READY RENTAL CARS
PAY PARKING
TAXIWAY
BLAST FENCE
NORTHWEST EXPANSION
EXISTING TERMINAL REMODEL
AIRLINE/AIRPORT SPACE
PIER EXPANSION
TERMINAL APRON
SERVICE ROAD
BLAST FENCE
SOUTHEAST EXPANSION
GEN. & CHILLER
LOADING
FIRE STATION
TAXILANE
NORTH
SCALE: 1" = 32'
FIGURE 5-7
SITE PLAN
ALTERNATIVE FOUR APRON LEVEL
Morrison Maierle/CSSA
TRA Airport Consulting
PROJECT NUMBER 54270.01

EMPLOYEE PARKING

RENTAL CAR RETURN

READY RENTAL CARS

TAXIWAY

BLAST FENCE

NORTHWEST EXPANSION

B 757

CIRC.

BAGGAGE CLAIM LOBBY

AREA RESERVED FOR EXPANSION

EXISTING TERMINAL REMODEL

PAY PARKING

DROP-OFF LANE

THROUGH LANE

CANOPY

GREETERS LOBBY

45° QUEUE SECURITY

SECURITY

CONCOURSE CIRCULATION

GATE LOBBY

TOILET ROOMS

SEC. OFF.

COMMUTER GATE LOBBY

BLDG. SERV.

W.

M.

TERMINAL APRON

PIER EXPANSION

B 727

RESTAURANT

OBSERVATION LOUNGE

CHIL.

KITCHEN

COCKTAIL LOUNGE

UNASSIGN.

TICKETING LOBBY BELOW

BLAST FENCE

SOUTHEAST EXPANSION

GEN. & CHILLER

LOADING

FIRE STATION

TAXILANE

NORTH

0 16 32 64 128 FT.

SCALE: 1" = 32'

FIGURE 5-8

SITE PLAN
ALTERNATIVE FOUR CONC. LEVEL

PROJECT NUMBER

SHEET NUMBER

REVISIONS

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Architecture
Engineering
Planning
Surveying

TRA Airport Consulting

Each alternative was evaluated against a set of evaluation criteria which was established based on development objectives and the planning and design goals discussed in the previous section. The evaluation criteria used are as follows:

- Passenger Convenience
  - Convenience and clarity of organization
  - Functional efficiency
  - Passenger processing efficiency
  - Visual aesthetics
  - Minimization of security deficiencies
  - Convenient ground access
  - Minimization of walking distances
- Airside Operation
  - Accommodation of aircraft movement requirements
  - Minimization of commuter/jet aircraft conflicts
  - Minimization of snow removal conflicts
  - Separation of conflicting functions
  - Accessibility to runway/taxiways
  - Equipment storage capability
- Airport/Airline Operations
  - Relocation of airport offices
  - Sufficient space for airline offices/operations
  - Ability to accommodate future growth
  - Ability to operate independently
  - Ability to meet passenger service requirements
  - Passenger convenience/safety
  - Sufficient space for concessions
- Implementation
  - Ability to phase construction
  - Impact on operations during construction
  - Impact on adjacent facilities
  - Technical feasibility

- Capital Costs

  - Relative cost of construction

The evaluation process involved ranking each of the four alternatives developed relative to the above evaluation criteria using the following scoring system:

0 to 4	Does Not Meet the Evaluation Criteria
5 to 7	Adequately Meets the Evaluation Criteria
8 to 10	Exceeds the Evaluation Criteria

The Terminal Alternatives Evaluation Matrix shown in Figure 5-9 summarizes the evaluation process and lists advantages and disadvantages of each alternative.

V. RECOMMENDED TERMINAL DEVELOPMENT ALTERNATIVE

From the evaluation matrix illustrated in Figure 5-9, it can be seen that Terminal Development Alternative Four rated highest compared to the other alternatives evaluated. It has therefore been selected as the Recommended Terminal Development Alternative.

The key advantages of the recommended alternative include:

- Efficient use of the new Pier.
- Sufficient space to meet facility requirements with flexibility to change and expand.
- Sufficient space for aircraft to safely power away from the gates.
- Separation of commuter functions and aircraft from those of the larger carriers.
- The most convenient and efficient passenger processing.

Figures 5-7 and 5-8 illustrate overall site plans of Alternative Four for both the apron level and concourse level.

Terminal Alternatives Evaluation Matrix

Evaluation Criteria / Terminal Development Alt.		Alternative One Linear Concept–No Pier	Alternative Two Pier Concept–Commuter Fac. At Pier End	Alternative Three Pier Concept–Commuters Adjacent To Terminal Building	Alternative Four Pier Concept–Commuters On One Side Larger Carriers On The Other
Passenger Convenience	Advantage	• Most consistent with current visual/aesthetic quality of Terminal Building	• Well-defined commuter facility separate from larger carriers • Separate gate lobbies	• Separation of commuter operations from larger carriers • Separate gate lobbies	• Well-defined commuter facilities, separate from larger carriers • Good functional efficiency • Good passenger processing • Good location of security station • Separate gate lobbies
	Disadvantage	• Passengers must circulate past boarding gates • Security station location/processing • Narrow/small greeters lobby • Distance to commuter aircraft • Combined gate lobbies • Loss of observation lounge	• Long walk for commuter passengers • Pier is primarily circulation space on second level • Security station location/processing • Narrow/small greeters lobby • Loss of observation lounge	• Security station location/processing • Narrow/small greeters lobby • Long walk to large aircraft gate lobbies • Long walk to outboard commuter aircraft • Loss of observation lounge	• Long walk to large aircraft gate lobbies
	Rating	6	6	7	9
Airside Operations	Advantage	• Least impact on aircraft apron • Good access for snow removal • Good access to taxiways/runways	• Minimizes commuter/jet aircraft conflicts • Provides space for equipment storage • Good access to taxiways and runway • "Straight forward" aircraft parking layout	• Minimizes commuter/jet aircraft conflicts • Provides space for equipment storage	• Adequate aircraft spacing to allow for power-out requirement • Minimizes commuter/jet aircraft conflicts • Provides space for equipment storage • Good access to taxiways/runway
	Disadvantage	• Relatively tight spacing of aircraft which power out • Lack of storage space for equipment	• Aircraft must be pushed back	• Requires the use of blast fences to protect commuter aircraft • Blast fences impact snow removal and visual access to apron activities • Relatively tight spacing of aircraft which power out	• Requires the use of blast fence to protect commuter aircraft in initial phase • Blast fence impacts snow removal and visual access to apron • Three large aircraft gates provided in initial phase rather than four
	Rating	5	4	5	7
Airport/ Airline Operations	Advantage	• Less building to maintain and secure	• Sufficient space for concessions	• Sufficient space for concession	• Sufficient space to expand to four gates in future • Most efficient use of pier (both floors) • Sufficient space for concessions • Sufficient space to accommodate growth • Sufficient space to relocate airport offices in future
	Disadvantage	• Limited ability to accommodate growth • If additional carrier is added, there is limited space to relocate airport offices • Joint use of gate lobby space	• If additional carrier is added, there is limited space to relocate airport offices • Joint use of gate lobby space	• Joint-use commuter gate lobbies • If additional carrier is added, there is limited space to relocate airport offices	
	Rating	5	6	6	9
Implementation	Advantage	• Could be constructed in two phases rather than three • Sufficient space both to the northwest and southeast to accommodate expansion requirements • Lease impact on apron area	• Sufficient space both to the northwest and southeast to accommodate expansion requirements	• Sufficient space both to the northwest and southeast to accommodate expansion requirements	• Sufficient space both to the northwest and southeast to accommodate expansion requirements
	Disadvantage	• Impact to gate lobbies during northeast wall expansion • Expansion of northwest gate lobby deferred until phase two construction	• Three phases required to implement based on anticipated funds • Impact on aircraft parking and boarding during interim phases • Impact on apron area • Expansion of northwest gate lobby deferred until phase two expansion	• Three phases required to implement based on anticipated funds • Impact on aircraft parking and boarding during interim phases • Impact on apron area • Expansion of northwest gate lobby deferred until phase two expansion	• Three phases required to implement based on anticipated funds • Impact on aircraft parking and boarding during interim phases • Impact on apron area • Security station must be moved twice
	Rating	7	5	5	5
Capital Costs	Advantage	• Less building area would result in least construction cost	• Much of the upper level of the Pier could be comparatively inexpensive construction because it is primarily circulation space	• Much of the upper level of the pier could be comparatively inexpensive construction because it is primarily circulation space	• Lower initial boarding gate costs • Most efficient use of Pier structure
	Disadvantage		• Commuter facility would add to the cost of the project • Additional costs associated with larger apron area • Considerable space constructed as circulation	• Additional costs associated with larger apron area • Additional cost of blast fences • Considerable space constructed as circulation	• Additional costs associated with larger apron area • Additional cost of blast fences • Future expansion costs
	Rating	8	6	7	7
Comparative Ratings		31	27	30	37

FIGURE 5-9

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Architecture
Engineering
Planning
Interiors

TRA Airport Consulting

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DRAWN BY RLK
CHKD. BY JW/SB
APPR. BY
DATE 4/8/92
Q.A.
MOD. NUMB.

TERMINAL ALTERNATIVES EVALUATION MATRIX

PROJECT NUMBER 54270.01
SHEET NUMBER

Figures 5-10 through 5-12 provide more detailed illustrations of the terminal building expansion and the new two-level pier.

Terminal Development Phasing

The facilities illustrated in Figures 5-10 through 5-12 should generally be adequate to accommodate existing needs and future growth through the year 2005.

In order for the identified development to take place, the expansion must match the ability of the airport to fund the necessary construction. A detailed analysis of the economic feasibility and financing associated with the capital improvements that are recommended for Gallatin Field during the master planning period will be presented in Chapter 6.

The following is a general description of how construction of the Recommended Alternative would be phased to match the necessary financial requirements. Three phases would be required to complete the construction.

Phase One

In Phase One the southeast expansion of 80 feet would occur to the "ticketing end" of the terminal building. At the apron level, this expansion would provide ticket counters, airline ticket offices, and baggage make-up space for four independent carriers. Combined ticket counters, offices, and baggage make-up space would be provided for the commuter carriers.

This expansion would provide additional public seating, toilet rooms, and one additional entry vestibule. The arrivals and departures curb would also be relocated and expanded to accommodate the increased ticketing function.

To increase the depth of the ticketing lobby and create additional queuing and circulation space, the airside face of the terminal building would be moved to the northeast approximately 21 feet. The face of the ticket counters would also be moved to the northeast approximately 9 feet. The remaining 12 feet of added depth is allocated to the airline ticket offices and to the baggage make-up areas.

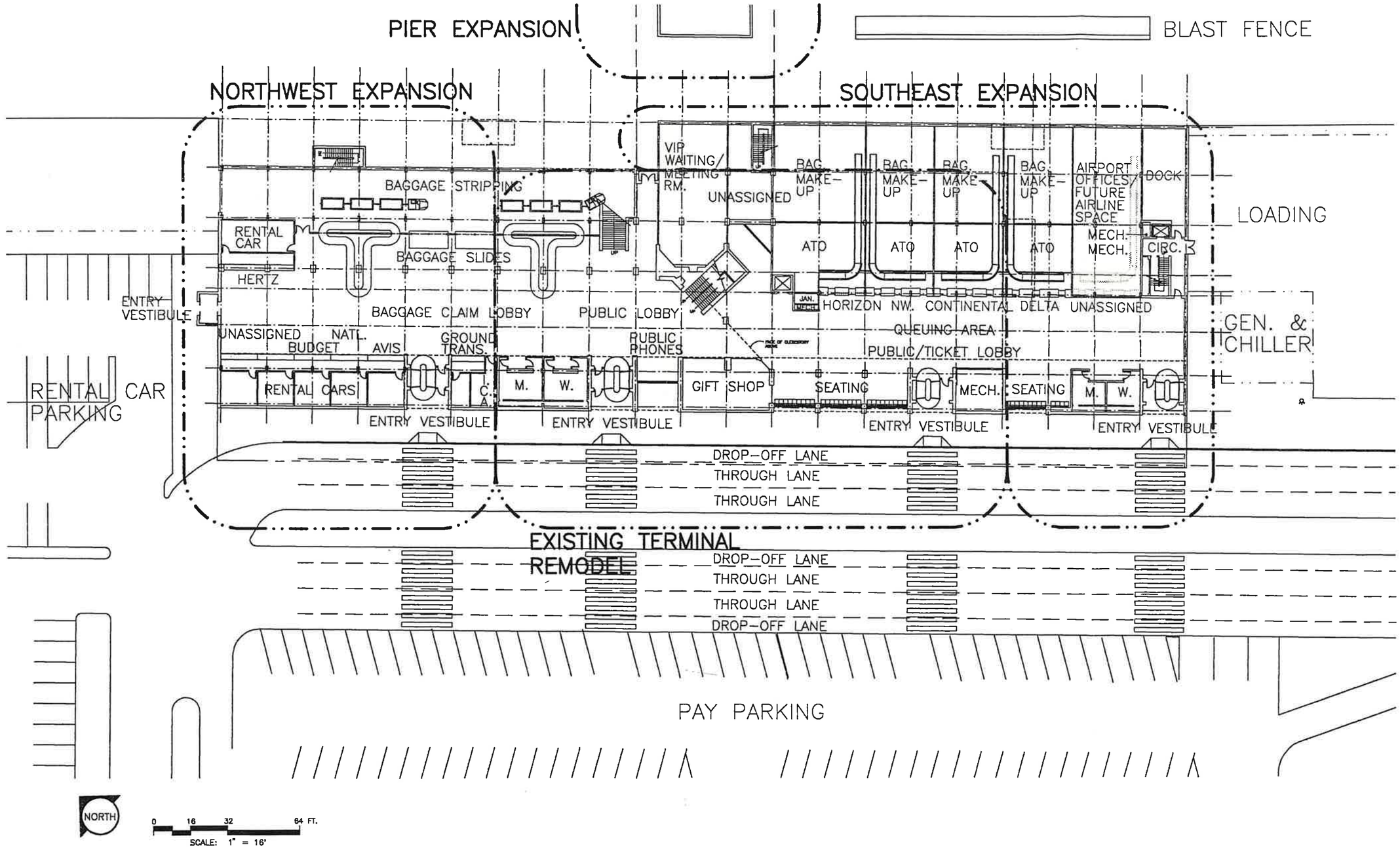

FIGURE 5-10

Morrison/CSSA Maierle/ TRA Airport Consulting

TERMINAL PLAN
ALTERNATIVE FOUR APRON LEVEL

PROJECT NUMBER 34270.01

PIER EXPANSION

NORTHWEST EXPANSION

SOUTHEAST EXPANSION

BLAST FENCE

45' QUEUE SECURITY

SEC. OFF.

TOILET ROOMS

CIRC.

AREA AVAILABLE FOR EXPANSION

GREETERS LOBBY

OBSERVATION LOUNGE

COCKTAIL LOUNGE

UNASS

M.

W.

CIRC.

LOADING

CIRC.

RESTAURANT

KITCHEN

JAN.

W.

M.

BAGGAGE CLAIM LOBBY

TICKETING LOBBY BELOW

GEN. & CHILLER

RENTAL CAR PARKING

CANOPY

THROUGH LANE

THROUGH LANE

EXISTING TERMINAL REMODEL

DROP-OFF LANE

THROUGH LANE

THROUGH LANE

DROP-OFF LANE

PAY PARKING

NORTH

0 16 32 64 FT.

SCALE: 1" = 16'

FIGURE 5-11

Morrison/Maierle/CSSA TRA Airport Consulting

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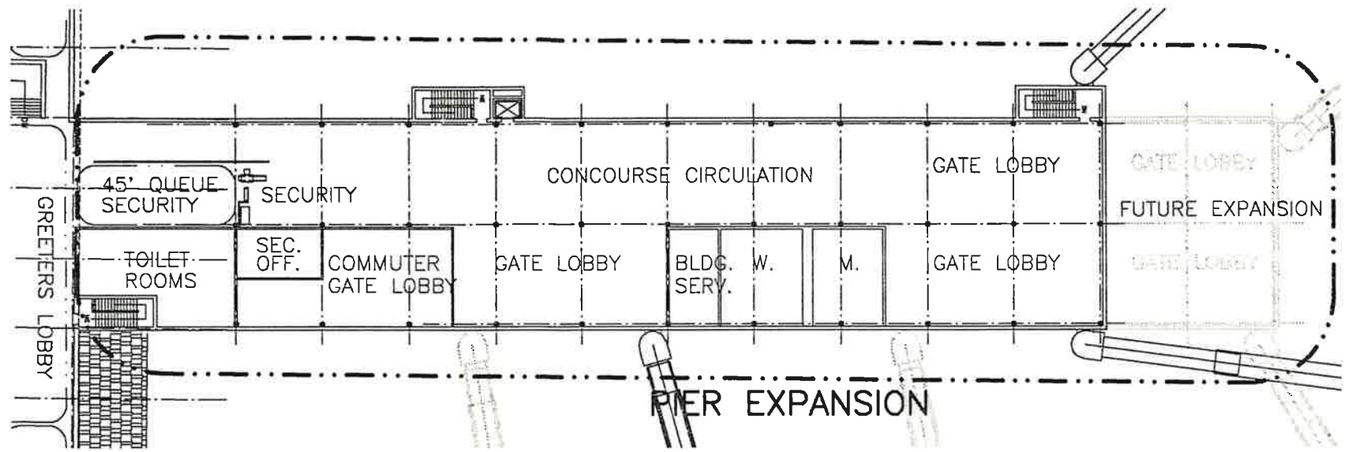
TERMINAL PLAN
ALTERNATIVE FOUR CONC. LEVEL

PROJECT NUMBER

SHEET NUMBER

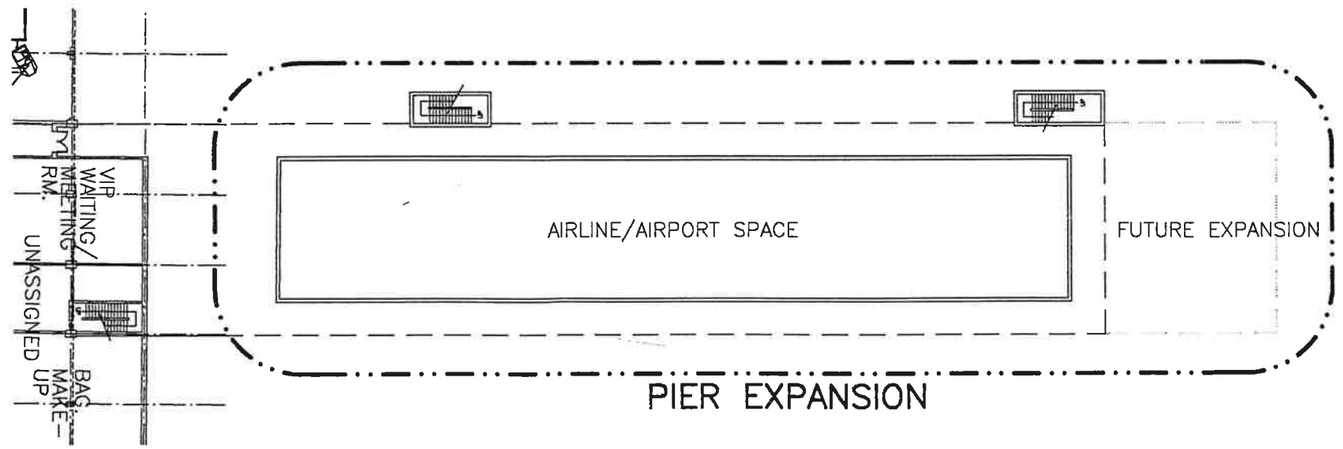


CONCOURSE LEVEL PLAN

NORTH

0 16 32 64 FT.

SCALE: 1" = 16'



APRON LEVEL PLAN

NORTH

0 16 32 64 FT.

SCALE: 1" = 16'

FIGURE 5-12

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Anderson Engineering Barton
TRA Airport Consulting

DRAWN BY: RLK
CHK'D BY: JW/SB
APVD BY:
DATE: 4/15/92
S.A.
PLOT SCALE

PIER PLANS
ALTERNATIVE FOUR

PROJECT NUMBER
54270.01
SHEET NUMBER

The dock would be relocated and expanded to approximately twice its current size.

The gift shop would not be expanded until Phase Two, when the car rental concession adjacent to the gift shop could be relocated.

The restaurant, lounge, and kitchen would be relocated to the concourse level. The space vacated by the existing restaurant, lounge, and kitchen would house VIP waiting and meeting rooms.

On the concourse level, the added floor area would house the kitchen, additional toilet rooms, and vertical circulation. Airlines would continue to use the existing gate lobby spaces during Phase One.

The restaurant would be located in the area currently occupied by the observation lounge. In Phase One there would be no observation lobby.

The security station and queuing would be relocated on an interim basis until it can be located in its permanent location in Phase Three. The interim location and configuration attempts to minimize, to the extent possible, the existing functional conflicts. Functional conflicts will not be eliminated, however, until the security station can be permanently located.

The airport offices currently located on the second floor would be relocated on an interim basis to the unassigned carrier ticketing and baggage make-up area at the southeast end of the building on the first floor.

Expansion of the northwest (baggage claim) end of the terminal building would not occur until Phase Two.

Phase Two

In Phase Two the baggage claim end of the terminal building would be expanded. This expansion would be to the northwest approximately 121 feet, 6 inches.

At the apron level, the baggage claim lobby would be expanded and house two recirculating claim conveyors and two of the existing bag slides.

The rental car and ground transportation spaces would be expanded with room for two additional rental car concessions.

Adjacent to the existing toilet rooms an infant change area would be provided.

The baggage stripping area would also be significantly increased to support the new claim conveyors.

Adjacent to the curb a new entry vestibule with revolving doors would be added. On the northwest end of the expanded terminal building a secondary entry/exit vestibule would be provided with electric sliding doors. An additional stair would also be provided between the first and second floors. The existing stair would provide access up to the second level, while the new stair would be used primarily to circulate down to the bag claim and public lobbies.

On the second floor, the added area would provide additional gate lobby space in the interim until the pier is constructed.

With construction of sufficient concession space to accommodate rental car functions, the gift shop can expand into the area which currently houses Hertz. This expansion would double the size of the existing gift shop.

The security station would remain in its interim location.

Through Phase Two, aircraft would continue to be parked in a linear fashion along the northeast face of the terminal building.

Phase Three

In Phase Three the two-level pier, or concourse, would be constructed. This concourse extends to the northeast approximately 276 feet.

At the apron level, the concourse would provide space for airport use, airline operations, and equipment storage.

A service road would be constructed around the outside perimeter of the aircraft parking apron.

At the concourse level, the pier would house the security station/queue, and office for security staff. Additional facilities that would be constructed include toilet rooms, building services, and gate lobbies for both commuter and national air carrier aircraft. With the construction of gate lobby space on the concourse, the interim gate lobbies in the expanded terminal building would become available for airport or airline use and for construction of an observation lounge.

Relocation of the security station to the concourse would also allow for construction of a larger greeters lobby.

VI. CONSTRUCTION COST ESTIMATES

The cost estimate for the Recommended Terminal Development Alternative is summarized in Table 5-10. The cost estimates presented were developed for general planning purposes based on anticipated average unit costs expressed in 1992 dollars. These costs are general estimates only and are not intended to provide actual engineering and construction costs. More precise costs should be determined when the specific projects are implemented. These costs have been estimated, however, from actual projects completed recently and adjusted as necessary to reflect local variations. In addition, a 25 percent engineering, administration, and contingency factor has been added. The detailed construction cost estimate appears in Table 5-11.

Environmental impact assessment, toxic waste removal, abatement inspection and testing, airline graphics, FIDS/BIDS, and equipment have been excluded from the estimate.

Chapter 6 of this Master Plan Update identifies potential sources of funding the recommended terminal improvements at the airport.

VII. LONG-RANGE DEVELOPMENT PLAN

Once the Recommended Development Alternative was selected, an analysis of how this terminal facility could be expanded beyond the twenty-year planning period was performed. Figure

5-13 illustrates the resulting long-range development plan for Gallatin Field.

Key elements of this plan include mirroring the approximate building envelope of the Recommended Alternative to the northwest. This would provide a possible building envelope of twice that of the Recommended Alternative, or approximately 190,500 square feet.

The apron area within the two concourse extensions would be reserved for commuter aircraft as a means of centralizing commuter activity and minimizing the potential conflicts with larger jet aircraft.

Larger jet aircraft would park on the ends of the concourses and around their outside perimeter. Parking positions for six commuter aircraft and eight second-level boarding gates for national carriers are illustrated.

The perimeter service road would be expanded to incorporate the additional facilities to the northwest.

On the landside, the passenger curb would be extended to serve the additional expansion.

Southwest of the curb and airport drive, land should be reserved to accommodate growth in public (pay) parking, private parking garages, rental car parking, and employee parking.

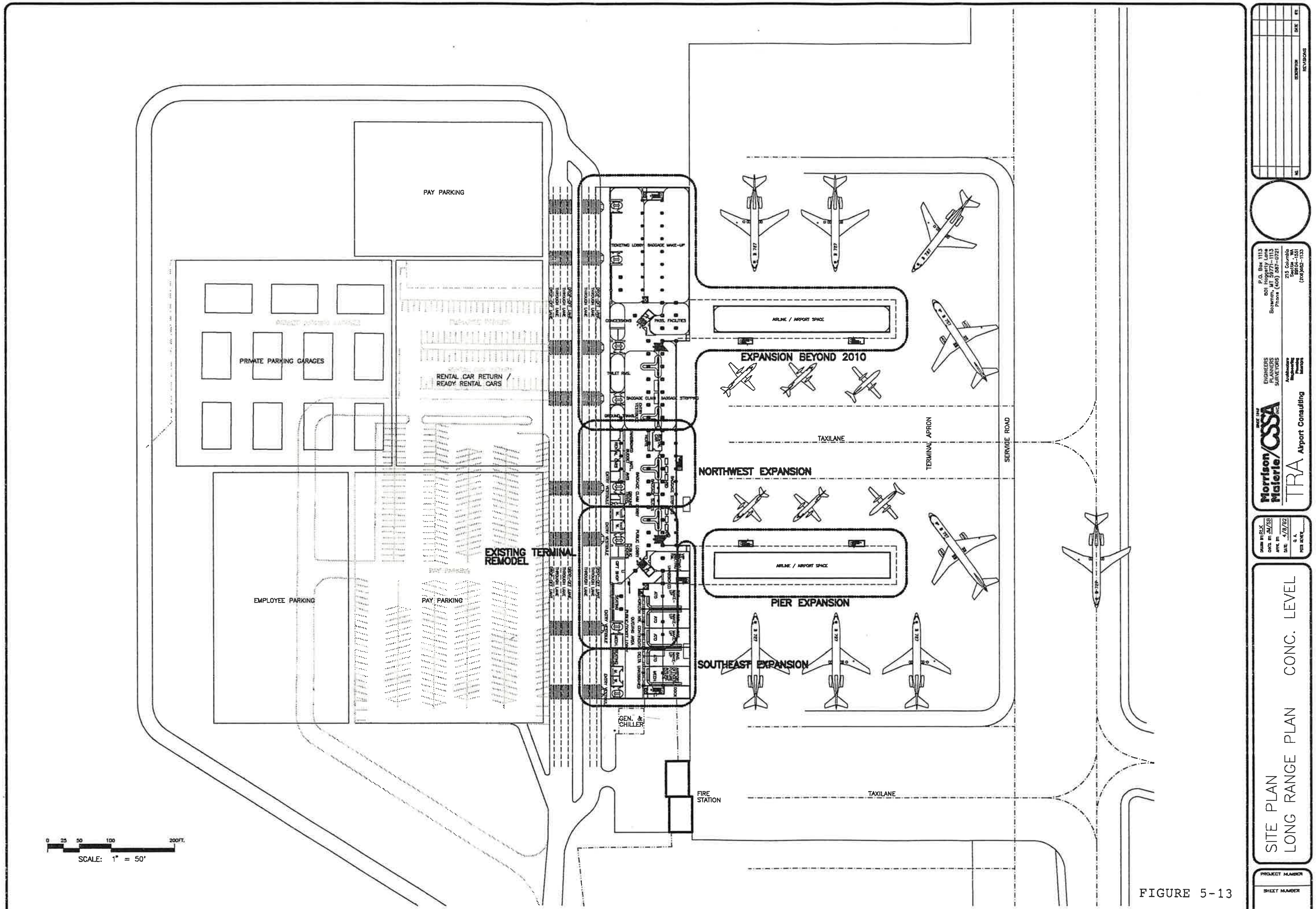
PAY PARKING
PRIVATE PARKING GARAGES
RENTAL CAR RETURN / READY RENTAL CARS
EMPLOYEE PARKING
PAY PARKING
TICKETING LOBBY
BAGGAGE MAKE-UP
CONCESSIONS
PASS. FACILITIES
AIRLINE / AIRPORT SPACE
EXPANSION BEYOND 2010
TOILET FAC.
BAGGAGE CLAIM
BAGGAGE STAGING
NORTHWEST EXPANSION
EXISTING TERMINAL REMODEL
AIRLINE / AIRPORT SPACE
PIER EXPANSION
SOUTHEAST EXPANSION
TAXILANE
TERMINAL APRON
SERVICE ROAD
GEN. & CHILLER
FIRE STATION
TAXILANE
0 25 50 100 200FT.
SCALE: 1" = 50'
Morrison Maierle/CSSA
ENGINEERS PLANNERS SURVEYORS
TRA Airport Consulting
SITE PLAN
LONG RANGE PLAN
CONC. LEVEL
PROJECT NUMBER
SHEET NUMBER

FIGURE 5-13

TABLE 5-12
TERMS

1. **ADMP (Average Day Peak Month) or Design Day**
   Basic planning term that facilities are designed to accommodate.

2. **Boarding Load Factor**
   The ratio of departing passengers to the departing aircraft seats.

3. **Gate Occupancy Factor**
   The number of minutes an aircraft occupies a gate (dwell) derived from the airlines schedule divided by 60 minutes.

4. **Greeters**
   People at or in the terminal meeting deplaning passengers. The effect of greeters on terminal planning is to increase terminal space requirements to accommodate their presence. Greeters are typically allowed through security and into boarding gate areas. They are non passengers.

5. **Operations will spread**
   Greater increases in the number of operations will occur in adjacent non peak hours, so the percentage of operations that occur during the peak hour will decrease.

6. **Peak Hour**
   A 60 minute period of the Design Day where the greatest number of activities (usually passengers or operations) occur.

7. **Peak Month**
   During a year the one month where activity (usually passengers or operations) is greatest.

8. **Peak of Peak Conditions**
   The largest volume of a series of peak conditions like at Thanksgiving.

TABLE 5-12 (cont.)
TERM

9. Peaking within the Peak Hour
   Aircraft or passengers do not arrive uniformly distributed throughout the peak hour to the baggage claim for example. They tend to be in bunches related to the aircraft schedules. These bunches are the peaks with in the peak hour and are capacities for which the baggage claim and ticket counters are designed.

10. Utilization Level
    An indicator of the use that a portion of an airport terminal is experiencing at peak hour. Stated as a percentage the number is derived by dividing the level of activity by the capacity of the area. 100% would be total capacity.

11. Wellwishers
    People that accompany departing passengers to the airport usually driving them and maybe saying good-bye at the gate. Their impact on terminal planning is similar to greeters because additional space is needed to accommodate them. They are non passengers.

Source: TRA Airport Consulting.

GALLATIN FIELD AIRPORT
MASTER PLAN UPDATE/TERMINAL FEASIBILITY STUDY
CHAPTER 6 - FINANCIAL PLAN

I. INTRODUCTION

This chapter provides a financial plan and examines the economic feasibility of developing the proposed improvements at Gallatin Field Airport. The use of airport revenue, federal grant programs, Passenger Facility Charges (PFC), and bond financing are evaluated in considering the ability of the Gallatin Airport Authority to finance the proposed capital improvements. Implementation of the improvements identified in Chapters 4 and 5 will be based on an as required basis consistent with the financial capability of the Authority.

Table 4-13 DEVELOPMENT SCHEDULE in Chapter 4 identified Airside capital improvements for the short term (1993-1997), medium term (1997-2001) and long term (2003-2012) time periods. Table 4-13 also identified Terminal Expansion in 1993 as a need of the Airport.

An inspection of Table 4-13 shows that Gallatin Field's Airside requirements in the short term are relatively few, and the most pressing airside needs were accomplished in the FY 1992 fiscal year. Major airside expenditures will not be required until the medium and long range periods. At this time the extension of Air Carrier Runway 12-30 and the upgrading of Runway 3-21 to General Aviation Basic II runway standards is projected to be required.

Terminal Expansion is the most pressing need currently facing Gallatin Field. Major improvements to the terminal are required in the short term. Chapter 5 discusses the Terminal Facility Requirements in detail and identifies a terminal expansion program to satisfy current and projected demands in the secured passenger holding gate areas, ticket lobby and airlines operational areas, baggage claim and handling, and restaurant areas. The proposed program, when constructed will solve the long standing "meeters and greeters" security problem.

The total cost of the terminal expansion program is in the twelve (12)) million dollar range, a very significant capital improvement program for an Airport the size of Gallatin Field. The financial plan compares the construction of the terminal improvements by stages with construction of a single large project. The plan also evaluates a number of funding alternatives including the Passenger Facility Charge (PFC) authorized in the Aviation Safety and Capacity Expansion Act of 1990. In developing the financial plan, maximizing the use of FAA grant programs and airport user fees and minimizing the need for local taxpayer support was given prime consideration.

Gallatin Field has reached a threshold size of airport (150,000 enplanements), where some type of local tax subsidy or guarantee is generally not required to finance major capital improvements. While there may be an interest rate advantage when selling bonds or borrowing money to have property taxpayer support, unless the cost of the program becomes very large and ambitious, a revenue bond program can be developed without the need for taxpayer guarantees.

Presently, the Airport Authority generates sufficient revenue from airport users and lessees to pay airport operation, maintenance and debt retirement costs without relying on taxpayer support. The elimination of taxpayer support occurred in the 1991 fiscal year, and was the result of the Authority being able to develop a fairly large reserve fund. Interest from the reserve fund is primarily used to match the local share of FAA projects and to pay for non-federally participating capital improvement projects.

At the present time, there is limited FAA discretionary funding available. The last major project at Gallatin Field which received significant discretionary federal assistance was the airside development associated with the terminal project in the late 1970's. For the purpose of this study, with the exception of Runway 3-21 land acquisition, it is assumed that federal discretionary funds will not be available for any FAA eligible improvements. Federal entitlement funds available to Gallatin Field, currently estimated to be $730,000 per year, may be accumulated for three years before the Airport Authority loses use of them.

II. AIRPORT FUNDING ALTERNATIVES

The feasibility of funding the proposed improvements is tied directly to the projected Airport revenue. Airport financing can come from various sources. The sources of revenue available for the development of Gallatin Field are:

* Gallatin County Taxes (permissible Airport Mill Levy)
* Revenue Bonds
* Tax Backed Revenue Bonds
* General Obligation Bonds
* Federal Grants for Airport Development
* State Grants for Airport Development
* Airport User Fees
* Passenger Facility Charge (PFC)

Airport Authorities Act

The Gallatin Airport Authority was created by Gallatin County in 1972 pursuant to Title 1, Chapter 9 R.C.M. 1947, as amended for the purpose of owning, operating and improving Gallatin Field. The Authority is governed by a Board of Commissioners

consisting of five members appointed by the Board of County Commissioners of Gallatin County.

The Authority has the power under Title 1, Chapter 9 (currently Title 67-11 MCA) of a municipal airport authority, including the power to own and operate the Airport, acquire real and personal property in connection therewith, establish rates, charges and rentals for use of the Airport, employ persons to operate and maintain the Airport, undertake improvements to the Airport and finance the improvements by the issuance of revenue bonds. The Authority is required to submit an annual budget to the Board of County Commissioners. The County agreed at the time the Authority was created and also covenanted in 1974 and 1976 Revenue Bond Sales to levy an ad valorem tax of two mills on all taxable property in the County for airport purposes and pay the proceeds to the Authority. The County is not authorized to levy a tax in excess of two mills for airport purposes, except to pay or anticipate deficiencies in the revenues pledged to the 1976 Bonds. The Authority has no independent taxing powers and derives its revenue solely from the operation of the airport, federal and state grants and the County tax levy.

In 1991, Authority reserve funds balances were such that the collection and payment of the two mill airport levy was suspended by the Authority and County. Should financial conditions deteriorate, the 1976 Bond Covenants would require the county Commissioners to again levy the 2-mills plus any deficiencies required to retire the 1976 Bonds.

The following section discusses in detail the current law with respect to the 2-mill airport levy.

Gallatin County Airport Mill Levy

67-11-201 MCA (1991) states that an airport authority has the power to certify annually to the governing bodies creating it the amount of tax to be levied for airport purposes. 67-11-201 further identifies the powers of the airport authority to sue and be sued; execute contracts for purposes of operating the airport; to plan, establish, acquire, develop, construct, purchase, enlarge, improve, maintain, equip, operate the airport for the comfort and accommodation of air travelers, to zone, and to acquire land.

67-10-402 (1)(a) more specifically provides:

"**67-10-402. Tax Levy.** (1) For the purpose of establishing, constructing, equipping, maintaining, and operating airport,

landing fields, and ports under the provisions of this chapter and as provided in Title 7, Chapter 14, Part 11, the County Commissioners or the city or town council may each year assess and levy, in addition to the annual levy for general administrative purposes or the all-purpose levy authorized by 7-6-4451 and 7-6-4452, a tax on the dollar of taxable value of the property of said county, city, or town:

(a) not to exceed 2 mills for airports and landing fields, and ....."

67-10-402 (3) more specifically provides:

"(3) No property within any political subdivision may be subject to a tax pursuant to this section at an annual rate in excess of 2 mills for airports, landing field, or ports unless it is found that the levy is insufficient for the purposes enumerated. In such a case the commissioners and councils acting are authorized and empowered to contract an indebtedness on behalf of such county, city, or town, as the case may be, upon the credit thereof by borrowing money or issuing bonds for such purposes, provided that no bonds may be issued for such purpose until the proposition has been submitted to the qualified electors and a majority vote cast therefore, except as provided in subsection (4)."

Subsection (4) states that an authority can budget to establish a reserve fund to resurface, overlay, or improve existing runways, taxiways, and ramps. The reserve must be based on competent engineering estimates and expended at least within 10 years. For Airport Authorities, this reserve is limited to $5 million for the use, repairs, maintenance, and capital outlays. (67-11-304, MCA (1991) Debt service fund.)

Bond Issue Options

Revenue Bonds

Financing airport facilities under the "Airport Authorities Act" Title 67-11 MCA (1991) allows an Airport Authority to sell bonds payable out of any revenues to the Authority, including revenues derived from: airport facilities, taxes levied, grants or contributions from the federal government or other sources. Issuance of revenue bonds by the Airport Authority does not require an election, but is subject to the limitation of the Airport Authority that annual pledged revenues meet the total bond payment.

Tax Backed Revenue Bonds

The Airport Authorities Act also states that if insufficient revenues are available to pay the principal and interest due on a revenue bond, that a general tax can be levied to pay for the

deficiency. This, however, requires approval of a majority of the voters voting on the question. If the voters do not approve the tax, then the Airport Authority would be limited to bonding the project as stated in 67-11-303 (1).

67-11-303 more specifically provides:

"**67-11-303. Bonds and Obligations.** (1) An authority may borrow money for any of its corporate purposes and issue its bonds therefore, including refunding bonds, in such form and upon such terms as it may determine payable out of any revenues of the authority, including revenue derived from:

(a) an airport or air navigation facility or facilities;
(b) taxes levied pursuant to 67-11-301 (Municipal tax levy.) or other law for airport purposes;
(c) grant or contributions from the federal government; or
(d) other sources.

(2) The bonds may be issued by resolution of the authority, without an election and without any limitation of amount, except that no such bonds may be issued at any time if the total amount of principal and interest to become due in any year on such bonds and on any then outstanding bonds for which revenues from the same source or sources are pledged exceeds the amount of such revenues to be received in that year as estimated in the resolution authorizing the issuance of the bonds. The authority shall take all action necessary and possible to impose, maintain, and collect rates, charges, rentals, and taxes, if any are pledged, sufficient to make the revenues from the pledged source in such year at least equal to the amount of such principal and interest due in that year.

(3) The bonds may be sold at public or private sale and may bear interest as provided in 17-5-102. Except as otherwise provided herein, any bonds issued pursuant to this chapter by an authority may be payable as to principal and interest solely from revenues of the authority and shall state on their face the applicable limitations or restrictions regarding the source from which such principal and interest are payable.

(4) Bonds issued by an authority or municipality pursuant to the provisions of this chapter are declared to be issued for an essential public and governmental purpose; by a political subdivision within the meaning of 15-30-111(2)(a).

(5) For the security of any such bonds, the authority or municipality may by resolution make and enter into any covenant, agreement, or indenture and may exercise any additional powers authorized to be exercised by a municipality under Title 7, Chapter 7, parts 44 (Municipal Revenue Bonds) and 45 (Municipal Refunding Revenue Bonds Option 1). The sums required from time to time to pay principal and interest and to create and maintain a reserve for the bonds may be paid from any revenue referred to in this chapter, prior to the payment of current costs of

operation and maintenance of the facilities.

(6) Subject to the conditions stated in this subsection (6), the governing body of any municipality having a population in excess of 10,000, with respect to bonds issued pursuant to this chapter by the municipality or by an authority in which the municipality is included, may by resolution covenant that in the event that at any time all revenues, including taxes, appropriated and collected for such bonds are insufficient to pay principal or interest then due, it will levy a general tax upon all of the taxable property in the municipality for the payment of such deficiency; and may further covenant that at any time a deficiency is likely to occur within 1 year for the payment of principal and interest due on such bonds, it will levy a general tax upon all the taxable property in the municipality for the payment of such deficiency, and such taxes are not subject to any limitation of rate or amount applicable to other municipal taxes but are limited to a rate estimated to be sufficient to produce the amount of the deficiency. In the event of more than one municipality having population in excess of 10,000 is included in an authority issuing bonds pursuant to this chapter, the municipalities may apportion the obligation to levy taxes for the payment of, or in anticipation of, a deficiency in the revenues appropriated for such bonds in such manner as the municipalities may determine. The resolution shall state the principal amount and purpose of the bonds and the substance of the covenant respecting deficiencies. No such resolution becomes effective until the question of its approval has been submitted to the qualified electors of the municipality at a special election called for that purpose by the governing body of the municipality and a majority of the elector voting on the question have voted in favor thereof. The notice and conduct of the election is governed, to the extent applicable, as provided for municipal general obligation bonds, in Title 7, chapter 7, part 42, for an election called by cities and towns, and as provided for county general obligation bonds in Title 7, chapter 7, part 22, for an election called by counties. If a majority of the electors voting thereon vote against approval of the resolution, the municipality has no authority to make the covenant or to levy a tax for the payment of deficiencies pursuant to this section, but such municipality or authority may nevertheless issue bonds under this chapter payable solely from the sources referred to in subsection (1) above."

General Obligation Bonds

Montana law 7-7-2201 MCA (1991) (Purposes for which general obligation bonds of a county may be issued.) provides for general obligation bond issues for counties to acquire land for sites and grounds for public buildings and for constructing, erecting or acquiring by purchase necessary public buildings. This allows the Authority to construct a project and repay the cost plus interest over a 15 to 20 year period. General obligation bonds are secured by the full faith, credit and taxing power of the

issuer. Without sufficient revenue from airport operations to cover a revenue bond, the public willingness to approve the issuance of general obligation bonds is critical.

Even with sufficient airport revenues, local and state support, and federal assistance, it is probable that borrowing will be required to finance major developments like terminal building development and at the same time address some of the other capital improvements proposed for acquisition or construction in the near term.

If there are insufficient airport revenues to cover O & M costs and coverage for revenue bond financing, the A.I.P. grant program, Passenger Facility Charges, state and local aid, and the willingness of the public to issue general obligation bonds become significant issues. The public support of general obligation bonds is tied directly with the community's understanding of the airport and the benefits it provides.

Bonded Indebtedness Limitations

7-7-2203 MCA (1991) places a county's bonded indebtedness limitation for general obligation bonds at approximately 11.25% of the taxable value of the property in the county. A number of exceptions such as high school bonds and emergency bonds exist. This limitation can also be exceeded depending on the interim production or new production of natural gas, petroleum or other crude oil products as defined in 15-23-607(2)(a) or (2)(b) and 15-23-612.

A review of "Montana Taxation - 1991" published by the Montana Tax Foundation, Inc., shows a debt service levy for Gallatin County in fiscal year 1990-1991. The taxable valuation for 1990-1991 was $71,638,121, therefore, the debt limitation would be approximately $8.06 million.

Gallatin County's current outstanding General Obligation Bonded Indebtedness is $3,700,000.00 for the Airport, Rest Home, and Law and Justice Center Bond issues. This leaves a balance of $4,360,000.00 which can be used for other facilities, including airports.

MCA 15-10-402 (Temporary and Effective July 1, 1990) states that the amount of taxes levied on property may not exceed the amount levied for taxable year 1986. Subsection (2) states that this limitation does not apply to bonded indebtedness.

Gallatin County is not restrained by statutory debt limits from financing major airport improvements using general obligation bonds.

Federal Grants

The U.S. Department of Transportation, through the Federal Aviation Administration, provides a portion of development costs for eligible airport projects. This program is the Airport Improvement Program (AIP). The authorizing legislation indicates that the government will grant up to 90 percent of costs on eligible and approved airport development projects. Terminal funding is limited to 85 percent of the fundable costs.

Commercial service airports which enplane 10,000 or more passengers are considered primary airports and receive a minimum of $400,000 annually in entitlement funds from the FAA. All or any portion of the entitlements given to an individual airport may be used for terminal development. Only enplanement funds can be used for Terminal Building projects. FAA "discretionary funds" may be allocated for high priority airside safety and certification projects if there are insufficient enplanement funds available from the airport's annual enplanement fund allocation.

Airports enplaning .01% or more of the nation's passengers are entitled to additional funds. Gallatin Field is forecast to enplane over .01% of the nation's passengers throughout the planning period, therefore, for the purpose of this study, it was assumed that Gallatin Field Airport will receive $757,765 in 1992-93 with annual increases based on forecast enplanements.

State Grants

The Department of Transportation, Montana Aeronautics Division no longer has a loan program for the development of airports. The State of Montana does not have an airport development grant program, but does provide $1,000 engineering grants for the preliminary and planning phases of approved FAA development projects.

The Big Sky Dividend which was defeated by voters in November 1992 or other future proposed infrastructure funding programs utilizing Coal Tax Funds may be available for loans or grants in future years. Airport projects are not eligible for funding under the current Treasure State Endowment program.

Airport User Fees

Airport revenue is also generated by users of the airport. Landing fees, fuel flowage, tiedown fees, hangar ground leases, terminal rent, rental car concession fees, restaurant rent, Flight Service Station and FAA Facilities rent, and parking income are the major sources of user fees which are discussed in this chapter. Airport user fees and revenues are established in order to reduce or eliminate the need for Airport Authority tax support.

Passenger Facility Charges (PFC)

Through Section 9110 of the Aviation Safety and Capacity Expansion Act of 1990, enacted November 5, 1990, Congress authorized domestic airports to impose a Passenger Facility Charge (PFC) on enplaning passengers, reversing a 17-year-old policy prohibiting such charges. In a 1972 decision, *Evansville-Vanderburgh Airport v. Delta Airlines* (405 U.S. 707), the Supreme Court ruled that tolls charged to enplaning and deplaning passengers were constitutional. Soon after, more than 40 airport operators proceeded to collect such tolls, and at least one local government diverted those revenues into the general city coffers. The federal government had recently established the Airport and Airway Trust Fund and had enacted an 8 percent federal ticket tax on domestic airplane fares. Congress decided that those and other federal user tax revenues would be sufficient to supplement local airport revenue to fund needed airport development without a direct charge imposed on passengers by the airport proprietor. Congress banned these airport tolls, called head taxes, when it passed the federal Anti-Head Tax Act in 1973. The recent PFC legislation provides an exception to that prohibition.

Airport head taxes have been widely used outside the United States to fund airport development. In the wake of exponential growth in demand for airport facilities brought about by airline deregulation in 1978, U.S. airport operators and executives have pressed the Executive Branch and Congress for a revision of the Anti-Head Tax Act to fund more airport development. Before the 101st Congress, various presidential administrations had supported lifting the prohibition on head taxes, generally as part of a package including defederalization and termination of the federal airport grant program for larger airports. In 1990, the Secretary of Transportation made enactment of PFCs without elimination of federal funding his top legislative priority. He recognized that there were critical shortages of airport capacity and airport capital development funds across the nation, while the Airport and Airway Trust Fund was increasingly spent on non-airport development expenses, such as FAA operations and airways facilities and equipment (F&E and research and development (R&D).

As part of the legislative compromise allowing PFCs, Congress also enacted a National Noise Policy, including provisions phasing out noisier Stage 2 aircraft and establishing procedures for approving local airport operators' noise restrictions on Stage 3 aircraft using their airports.

The new PFC law sets the general structure under which public agencies that own or operate airports may impose PFCs at their commercial service airports. Airport operators seeking to impose a PFC must apply to the Secretary of Transportation for PFC authority, after offering air carriers that use the airport an opportunity for consultation on the projects the airport proposes to include in the application. Airports, and later the USDOT/FAA, must meet a detailed set of notice and consultation

requirements designed to elicit the participation of affected airlines, other airport users, and other affected parties at various stages of the process. In addition, the law directed the Secretary to enact regulations to fill in the details of the PFC application and collection process.

On May 29, 1991, FAA published the final regulations, FAR Part 158, "Passenger Facility Charges," that governs an airport's application for authority to impose a PFC. These regulations, which have the force and effect of law, specify procedures for the way in which (1) an airport operator applies for authority to impose PFCs, (2) FAA processes these applications, (3) air carriers collect and remit PFC revenues, (4) record keeping and audit procedures would work, (5) PFC authority could end, and (6) how collection of a PFC would reduce the Airport Improvement Program (AIP) grants allocated to large and medium hub airport operators imposing a PFC.

The law designates the airport operator that controls a commercial service airport as initiator of the PFC process. The airport operator structures its capital improvement plan and decides how various parts of the plan are to be financed. If the airport operator decides to rely on a PFC for financing one or more specific projects or a multi-project program, it applies to FAA for separate authority to collect PFCs and to expend them accordingly. The airport operator may propose collecting $1, $2, or $3 per enplaned passenger, domestic or foreign. No intermediate amounts (e.g., $2.50) are permitted. As part of that process, the airport operator must notify the air carriers serving the airport that it is planning to apply for PFC authority, and must present to them its capital plan and financing strategy. In its application, the airport operator must summarize any airline comments contained in a certification of disagreement with the project and the airport's reasons for proceeding nonetheless. After the application is filed,FAA publishes a notice of the application in the *Federal Register* and receives comments from other airport users and interested parties. After receipt of all comments, FAA approves or disapproves the application. If the application is approved, the airlines are directed to begin collecting the PFC on a certain date.

The PFC level approved by FAA normally stays in operation until the PFC revenue collected plus interest earned equals the cost of the approved project. Throughout the collection and project completion process, the airport operator must send written notification to the air carriers and FAA if it intends to decrease the level of PFC collected from each passenger, decrease the total PFC revenue collected, or increase the revenue by 15 percent of less. Large-scale changes -- increasing the per-passenger charge, increasing total PFC revenue by more than 15 percent, making material changes in the scope of a project, or altering the class of carriers exempt from collection -- would require that the airport operator again notify and consult with the carriers. Finally, FAA retains the ability to terminate an airport operator's PFC authority if it determines that the air-

port operator violated certain rules regarding collection, use of PFC revenues, or that the airport violated the Airport Noise and Capacity Act of 1990 or its implementing regulations.

Summary

There are many options available to the Authority to provide the necessary funding for the operation and maintenance of Gallatin Field, as well as the construction of both Federally participating and non-participating capital improvements.

Given the current economic conditions and limitations voted by Montana Taxpayers on property taxes, the following sections do not propose the use of general obligation bonds or tax backed revenue bonds. The permissive 2-mill airport will also not be used unless required to make the project more financially viable.

The financial feasibility of the proposed capital improvement project will be based on:

Airport User Revenues
FAA Enplanement Funds
Passenger Facility Charges (PFC)
Revenue Bond Issues

Since Revenue Bond Issues may be retired by either Airport Revenues or a combination of Airport Revenues and PFC income, various combinations will be considered in development of the financial plan.

III. HISTORICAL AIRPORT REVENUES AND EXPENSES

General

Historical Airport Revenues and Expenses are allocated to the following cost centers:

* Airport Administration
* Reimbursed Expenses
* Airside Facilities
* Passenger Terminal Facilities
* General Aviation/Commercial Facilities

These allocations correspond to the Authorities' current Airline Operating Agreement at Gallatin Field and are used to determine whether airport costs are being recovered through rates and charges. Airlines in particular are sensitive to cost allocations, and generally demand allocation of costs to agreed upon cost centers when negotiating operating agreements and committing to capital improvements paid from airport revenues. The current Airline Operating Agreement has a 20 year term expiring in 1998. (20 years after terminal occupancy).

For the purposes of this report, the following definitions apply:

* Airport Administration includes airport administrative income and costs not allocable directly to a cost center. Included in this are the Airport Administration salaries, Tax Revenues and Interest Revenue.

* Reimbursed expenses includes the costs associated with providing services not covered by Operating Agreements or leased to the airlines or other airport tenants.

* Airside (Airfield) Facilities includes the land, the runways, taxiways, aprons, ramps, lights, radio aids, navigational aids and all conveniences for flying, landing and take-off of aircraft. Aircraft Rescue and Fire Fighting (ARFF) costs are included in the Airside facilities definition.

* Passenger Terminal Facilities includes all passenger terminal building space, terminal access roads, and terminal parking areas.

* General Aviation and Commercial Facilities includes hangars, buildings, land, ground sites and other facilities used for aeronautical purposes as well as buildings, land, ground sites and other facilities used for industrial or commercial purposes, including roadways and other facilities solely serving such areas.

Historical Income and Expenses

Using the past six fiscal years financial reports, and the FY 1993 Budget, excluding Federal Grants, income and O & M expenses have been allocated to cost centers as shown in Tables 6-1 (Income) and 6-2 (Expenses):

Historical Allocation of Administrative Cost to Cost Centers

The results of allocating Administrative costs to the Airside, GA/Commercial, and Terminal Cost Centers for FY 1987 through FY 1993 is shown in Table 6-3.

The purpose of the table and allocation is not to determine whether a particular class of airport tenant is paying their way, but to compare income with expenses, and to develop leasing policies so that sufficient funds are available to fund needed airport improvements.

calc\bzn\Table6-1

TABLE 6-1
HISTORICAL INCOME
(Fiscal Year 1987-1993)

INCOME	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993
1. Airport Administration							
Taxes	$140,400	$149,471	$146,267	$157,431	$20,375	$10,832	$0
Interest	$77,815	$83,856	$153,493	$284,112	$224,978	$171,971	$147,640
Miscellaneous Revenue		$31,757	$10,314		$13,740	$7,253	$0
Adminstration Totals	$218,215	$265,084	$310,074	$441,543	$259,093	$190,056	$147,640
2. Reimbursed Expenses							
Miscellaneous Revenue (Capital Improvement Fund)							$2,057,951
Reimbursed Expense Totals	$0	$0	$0	$0	$0	$0	$2,057,951
3. Airside Facilities							
Airline Landing Fees (Major Carriers)	$237,439	$232,647	$231,204	$239,506	$249,576	$263,678	$263,858
Landing Fees (Commuter & Other)			$32,404	$28,695	$29,302	$30,321	$29,934
Fuel Flowage	$9,465	$8,707	$8,402	$8,399	$9,079	$10,566	$9,250
Tiedown Fees	$2,193	$2,451	$2,780	$3,236	$3,746	$3,240	$3,160
Farm Income	$1,167	$1,738	$2,587	$3,124	$3,152	$4,137	$4,000
Water & Sewer Land Rental Charges	$2,415	$2,100	$1,988	$1,950	$1,800	$2,650	$3,600
Airside Totals	$252,679	$247,643	$279,365	$284,910	$296,655	$314,592	$313,802
4. General Aviation/Commercial Facilities							
Old Terminal & FSS Rent	$47,791	$43,054	$41,704	$60,345	$61,424	$57,846	$61,416
FAA Sector Field Office				$3,754	$15,016	$15,016	$15,016
FBO Building Lease	$17,615	$17,615	$17,615	$17,315	$17,315	$17,315	$17,616
Hangar Rents	$4,800	$4,820	$5,010	$4,820	$5,000	$4,690	$4,319
Ground Leases (FBO & T-Hangar)	$22,563	$27,808	$26,743	$29,499	$32,597	$36,940	$37,170
GA/Commercial Totals	$92,769	$93,297	$91,072	$115,733	$131,352	$131,807	$135,537
5. Passenger Terminal Building Facilities							
Airline Rent	$198,397	$223,022	$225,600	$239,582	$251,901	$264,267	$271,534
Rental Cars	$194,074	$252,946	$274,708	$299,549	$300,841	$388,627	$391,120
Parking	$47,655	$55,829	$55,188	$59,085	$70,012	$102,683	$104,000
Resturant & Lounge	$9,592	$13,808	$11,938	$11,479	$13,644	$14,400	$14,500
Gift Shop	$6,292	$6,195	$6,477	$6,753	$7,639	$7,655	$10,250
Advertising	$11,255	$11,555	$10,545	$10,070	$10,655	$22,355	$22,360
Miscellaneous (Phone, Games, etc.)	$19,832	$21,214	$20,051	$26,127	$29,930	$44,400	$36,330
Passenger Terminal Totals	$487,097	$584,569	$604,507	$652,645	$684,622	$844,387	$850,094
TOTAL INCOME (Excluding FAA Grants)	$1,050,760	$1,190,593	$1,285,018	$1,494,831	$1,371,722	$1,480,342	$3,505,024
FAA Grants	$533,738	$9,192	$1,609,465	$211,000	$572,329	$267,786	$1,857,520
TOTAL INCOME (Including FAA Grants)	$1,584,498	$1,199,785	$2,894,483	$1,705,831	$1,944,051	$1,748,628	$5,362,544

c\bzn\table6-1

TABLE 6-2
HISTORICAL OPERATIONS AND MAINTENANCE EXPENSES
(Fiscal Year 1987-1993)

EXPENSES	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993
1. Airport Administration							
Salaries & Benefits	$40,209	$49,290	$56,135	$59,543	$77,378	$89,021	$100,624
Legal and Audit	$8,948	$7,512	$7,644	$10,682	$7,285	$4,675	$10,750
Board and Office Expenses	$14,288	$19,351	$13,601	$16,998	$17,747	$12,288	$15,171
Adminstration Totals	$63,446	$76,154	$77,381	$87,223	$102,411	$105,984	$126,545
2. Reimbursed Expenses							
Miscellaneous Expense							
Reimbursed Expense Totals	$0	$0	$0	$0	$0	$0	$0
3. Airside Facilities							
Salaries & Benefits	$78,591	$96,340	$109,719	$116,380	$151,240	$173,996	$196,674
ARFF & Maint. Bldg. O & M	$2,457	$3,097	$3,089	$2,997	$3,605	$3,631	$4,281
Equipment O & M	$11,958	$15,149	$26,334	$34,509	$38,061	$31,066	$42,550
Field Maintenance	$7,561	$6,775	$9,669	$5,920	$10,261	$11,250	$9,125
Utilities	$12,424	$14,689	$13,971	$13,746	$15,639	$16,951	$19,508
Insurance	$19,230	$18,902	$13,104	$12,806	$12,140	$11,938	$15,505
Miscellaneous Airside Expenses	$3,788	$2,622	$3,885	$5,320	$11,854	$8,838	$10,400
Airside Totals	$136,009	$157,573	$179,771	$191,678	$242,800	$257,670	$298,043
4. General Aviation/Commercial Facilities							
Salaries & Benefits	$14,622	$17,924	$20,413	$21,652	$28,138	$32,373	$36,592
Old Term. & FAA Sector Bldg. O & M	$2,457	$3,097	$3,089	$2,997	$3,605	$3,631	$4,281
Utiltities	$4,577	$5,412	$5,147	$5,064	$5,762	$6,245	$7,187
Insurance	$2,404	$2,363	$1,638	$1,601	$1,518	$1,492	$1,938
GA/Commercial Totals	$24,059	$28,795	$30,287	$31,314	$39,022	$43,741	$49,998
5. Passenger Terminal Building Facilities							
Salaries & Benefits	$49,348	$60,493	$68,893	$73,076	$94,964	$109,253	$123,492
Terminal Building O & M	$19,653	$24,774	$24,710	$23,975	$28,842	$29,048	$34,251
Utiltities	$47,082	$55,662	$52,941	$52,090	$59,262	$64,235	$73,924
Insurance	$26,442	$25,990	$18,018	$17,608	$16,693	$16,414	$21,318
Miscellaneous Terminal Expenses	$1,500	$12,525	$11,506	$4,815	$17,500	$10,830	$10,623
Passenger Terminal Totals	$144,024	$179,444	$176,069	$171,564	$217,262	$229,780	$263,608
TOTAL EXPENSES (Excluding Capital Improvements and Debt Retirement)	$367,538	$441,966	$463,507	$481,778	$601,494	$637,175	$738,194

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TABLE 6-2 (Continued)
HISTORICAL OPERATIONS AND MAINTENANCE EXPENSES
(Fiscal Year 1987-1993)

EXPENSES	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993
Brought Forward from Preceding Page							
TOTAL EXPENSES (Excluding Capital Improvements and Debt Retirement)	$367,538	$441,966	$463,507	$481,778	$601,494	$637,175	$738,194
TOTAL INCOME (Excluding FAA Grants)	$1,050,760	$1,190,593	$1,285,018	$1,494,831	$1,371,722	$1,480,842	$3,505,024
SURPLUS AUTHORITY FUNDS AVAILABLE FOR CAPITAL IMPROVEMENTS & DEBT RETIREMENT	$683,222	$748,627	$821,511	$1,013,053	$770,228	$843,667	$2,766,830
FAA Grants	$533,738	$9,192	$1,609,465	$211,000	$572,329	$267,786	$1,857,520
TOTAL SURPLUS FUNDS AVAILABLE (Including FAA Grants)	$1,216,960	$757,819	$2,430,976	$1,224,053	$1,342,557	$1,111,453	$4,624,350
6. Capital Improvements							
Administration	$6,253	$17,657	$62,282	$8,797	$1,069		$60,000
Airside	$6,996	$10,225	$4,773	$27,424	$25,163	$88,938	$24,000
GA and Commercial	$17,026	$24,386	$27,721	$119,402	$13,636	$35,824	$35,000
Passenger Terminal	$14,595	$32,992	$3,785	$21,607	$18,146	$250,610	$3,678,250
FAA Participating Projects	$515,229	$73,350	$1,697,690	$398,759	$551,769	$313,819	$576,179
Capital Improvement Totals	$560,099	$158,610	$1,796,251	$575,989	$609,783	$689,191	$4,373,429
7. Debt Retirement							
Montana Aeronautics Division Loans	$30,768	$30,132	$22,930	$23,475	$23,435	$23,848	$23,711
1974 Series Bonds	$57,634	$44,800	$42,400				
1976 Series Bonds	$167,634	$182,508	$181,108	$224,393	$222,440	$225,160	$227,210
Debt Retirement Totals	$256,036	$257,440	$246,438	$247,868	$245,875	$249,008	$250,921
SURPLUS or (DEFICIT)	$400,825	$341,769	$388,288	$400,196	$486,899	$173,254	$0

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TABLE 6-3
HISTORICAL ALLOCATION OF ADMINISTRATIVE COSTS TO COST CENTERS
OPERATION & MAINTENANCE COST WITHOUT CAPITAL IMPROVEMENTS
FY 1987 THRU FY 1993

Cost Center	Budgeted Unallocated Costs	Budgeted Allocated Costs	Budgeted Cost Center Income	Budgeted Surplus (Deficit)
1. FY 1987				
Administration	$63,446		$218,215	$218,215
Reimbursed Expense	$0	$0	$0	$0
Airside	$136,009	$164,386	$252,679	$88,293
GA/Commercial	$24,059	$29,079	$92,769	$63,690
Terminal	$144,024	$174,073	$487,097	$313,024
FY 1987 Totals	$367,538	$367,538	$1,050,760	$683,222
2. FY 1988				
Administration	$76,154		$265,084	$265,084
Reimbursed Expense	$0	$0	$0	$0
Airside	$157,573	$190,376	$247,643	$57,267
GA/Commercial	$28,795	$34,789	$93,297	$58,508
Terminal	$179,444	$216,800	$584,569	$367,769
FY 1988 Totals	$441,966	$441,966	$1,190,593	$748,627
3. FY 1989				
Administration	$77,381		$310,074	$310,074
Reimbursed Expense	$0	$0	$0	$0
Airside	$179,771	$215,797	$279,365	$63,568
GA/Commercial	$30,287	$36,356	$91,072	$54,716
Terminal	$176,069	$211,353	$604,507	$393,154
FY 1989 Totals	$463,507	$463,507	$1,285,018	$821,511
4. FY 1990				
Administration	$87,223		$441,543	$441,543
Reimbursed Expense	$0	$0	$0	$0
Airside	$191,678	$234,051	$284,910	$50,859
GA/Commercial	$31,314	$38,236	$115,733	$77,497
Terminal	$171,564	$209,491	$652,645	$443,154
FY 1990 Totals	$481,778	$481,778	$1,494,831	$1,013,053
5. FY 1991				
Administration	$102,411		$259,093	$259,093
Reimbursed Expense	$0	$0	$0	$0
Airside	$242,800	$292,622	$296,655	$4,033
GA/Commercial	$39,022	$47,029	$131,352	$84,323
Terminal	$217,262	$261,843	$684,622	$422,779
FY 1991 Totals	$601,494	$601,494	$1,371,722	$770,228

TABLE 6-3 (Continued)
HISTORICAL ALLOCATION OF ADMINISTRATIVE COSTS TO COST CENTERS
OPERATION & MAINTENANCE COST WITHOUT CAPITAL IMPROVEMENTS
FY 1987 THRU FY 1993

Cost Center	Budgeted Unallocated Costs	Budgeted Allocated Costs	Budgeted Cost Center Income	Budgeted Surplus (Deficit)
6. FY 1992				
Administration	$105,984		$190,056	$190,056
Reimbursed Expense		$0	$0	$0
Airside	$257,670	$309,081	$314,592	$5,511
GA/Commercial	$43,741	$52,468	$131,807	$79,339
Terminal	$229,780	$275,626	$844,387	$568,761
FY 1992 Totals	$637,175	$637,175	$1,480,842	$843,667
7. FY 1993				
Administration	$126,545		$147,640	$147,640
Reimbursed Expense	$0	$0	$2,057,951	$2,057,951
Airside	$298,043	$359,706	$313,802	$-45,904
GA/Commercial	$49,998	$60,342	$135,537	$75,195
Terminal	$263,608	$318,146	$850,094	$531,948
Y 1993 Totals	$738,194	$738,194	$3,505,024	$2,766,830

Note: Administrative costs allocated in direct proportion to cost center costs less reimbursed costs. Reimbursed costs are reimbursed without any allocation of administrative costs.

IV. RECOMMENDED DEVELOPMENTS

General

Identified in Table 6-4 (Airport Capitol Improvement Program) are the major developments as outlined in Chapter 4 (Facility Requirements) and Chapter 5 (Terminal Area Facility Requirements). The majority of the items listed are necessary to maintain the airport's existing facilities in operable condition.

Five Year Capital Improvement Program (1993-1997)

The primary concerns of the Five Year Capitol Improvement Program are to address the terminal needs and complete the Environmental Assessment regarding Runway 21 for future expansion of this runway. The 1992 program included the following items:

Construction of acceleration/deceleration lanes at the intersection of the airport access road and Old Highway 10 to include bituminous paving, roadway signing and striping, lighting, and other incidental items.

Modify or install approximately 30 runway and taxiway guidance signs.

Construct and pave approximately 540 S.Y. of parking apron complete with fencing and aircraft tiedowns.

Complete safety area grading including required storm drainage structures.

Install five vertical pivot gates complete with necessary fencing.

Construct and pave approximately 1,000 S.Y. of parking lot adjacent to an existing car wash.

The Federal A.I.P. law was extended for one year in 1992. It is anticipated that there will be sufficient entitlement funds available for terminal construction of the allowable public use areas. It is anticipated that Phase I of the Terminal Expansion will be completed during 1993 and 1994 under a multi year grant. The required environmental documents for the future expansion of Runway 3-21 will also be completed during FY 1993 and 1994. Land Acquisition for Runway 3-21 is programmed in FY 1995.

Phase II terminal expansion will complete the Five Year Capital Improvement Program in FY 1997.

Medium Range Capitol Improvements (1998-2002)

The Medium Range Capital Improvements are programmed to include Phase III terminal expansion and the modifications to the terminal apron area to complete the center pier expansion. The replacement of the Airport's broom truck and Walters ARFF truck and other incidental vehicle purchase is also planned during this portion of the planning period. The first phase of Runway 3-21 development (extend to 4400 ft) will also be completed during the medium range planning period. The expansion to the fire station is also included in this planning period.

The Airport Authority should review the forecast enplanements developed in this plan before constructing Phase III of the terminal expansion. Actual enplanements should be compared to the forecast numbers and a needs assessment completed to justify the project. If it is found that Phase III is to be delayed into the future, the Passenger Facility Charge Plan should be reviewed and amended as necessary.

Long Range Capital Improvements (2003-2012)

The Long Range Capitol Improvements Program includes a building addition to the maintenance building. Expansion to the terminal area apron, Runway 12-30 and Runway 3-21 area also planned to be completed during the long range planning period. The remaining items of improvements include the rehabilitation of runways, taxiways, access road and tiedown aprons.

Table 6-4 is a complete list and preliminary cost estimate of the recommended improvements for the planning period. The cost estimates have been completed based on 1992 dollars and increased at an inflation rate of 4% per year to the year the improvements are to be completed.

Table 6-5 is the summary of the twenty year development schedule. The summary estimates A.I.P. entitlements based on the forecast enplanements developed in Chapter 2. The schedule maximizes the use of A.I.P. entitlements and includes P.F.C. funding of the terminal building expansion. Construction costs are as presented in Table 6-4.

TABLE 6-4
AIRPORT CAPITAL IMPROVEMENT PROGRAM
(1993-2012)
ASSUMES 1992 CONSTRUCTION COSTS PLUS 4% INFLATION

PHASE I 1993-1997		**COST**
1. Runway 3-21 Environmental Assessment		$ 30,000.00
2. Phase I Terminal Expansion	*	$5,022,000.00
3. Runway 3-21 Land Acquisition	*	$ 400,000.00
4. Phase II Terminal Expansion		$3,129,000.00
SUBTOTAL PHASE I		$8,581,000.00

PHASE II 1998-2002		**COST**
1. Replace Snow Plows #5 and #6		$ 300,000.00
2. Runway 3-21 Construction		$ 525,000.00
3. Front End Loader/Ramp Plow		$ 210,000.00
4. Phase III Terminal Expansion	*	$3,464,000.00
5. Terminal Apron Expansion (Asphalt)		$ 370,000.00
6. Fire Station Expansion		$ 593,000.00
7. Front End Loader		$ 235,000.00
SUBTOTAL PHASE II		$5,697,000.00

PHASE III 2003-2012	**COST**
1. Terminal Apron Expansion	$3,225,000.00
2. Expand Maintenance Building	$ 750,000.00
3. Access Road and Storm Drainage Improvements	$2,325,000.00
4. Overlay Taxiway System	$2,185,000.00
5. Overlay Runway 12-30	$1,350,000.00
6. Develop Runway 3-21 to BII Standards	$ 950,000.00
7. Extend Runway 12-30 to 10,500	$2,745,000.00
8. Extend Parallel Taxiway	$2,370,000.00
SUBTOTAL PHASE III	$15,900,000.00
TOTAL ESTIMATED COSTS OF PROJECT	**$30,178,000.00**

* Note:

Phase I Terminal expansion includes $100,000 for PFC application and bonding costs.

Runway 3-21 land acquistion requires AIP Discretionary Funds.

Phase III Terminal expansion includes $35,000 for bonding costs.

TABLE

TWENTY YEAR DEVELOPMENT SCHEDULE

DEVELOPMENT SCHEDULE MAXIMIZES THE AIP ENTITLEMENTS
Assumes 1992 Construction Costs - Plus 4.0% Inflation

FISCAL YR END	EST CY PASS'GERS	EST ENP INCOME	PROJECT COST	AIP SHARE	PFC FUNDING	SPONSOR SHARE	AIP BALANCE	PROJECT DESCRIPTION
							101,656	
1992	141,898	723,824					825,480	
1993	153,812	757,765	30,000	27,000		3,000	1,556,245	RUNWAY 3-21 ENVIRONMENTAL ASSESSMENT
1994	150,000	821,356	5,022,000	2,377,601	2,000,000	644,399		PHASE I TERMINAL EXPANSION
1995	155,635	801,000	400,000	360,000		40,000	801,000	* RUNWAY 3-21 LAND ACQUISITION
1996	161,270	831,091					1,632,091	
1997	167,236	861,182	3,129,000	2,493,273	550,000	85,727		PHASE II TERMINAL EXPANSION
1998	173,202	893,040	300,000	270,000		30,000	623,040	REPLACE SNOW PLOWS 5 & 6
1999	179,168	924,899	525,000	472,500		52,500	1,075,439	DEVELOP 3-21 TO 80% OF BII STANDARDS
			210,000	189,000			886,439	FRONT END LOADER/RAMP PLOW
2000	185,134	956,757					1,843,196	
2001	191,100	988,616	3,464,000	2,634,000	730,000	100,000	197,811	PHASE III TERMINAL EXPANSION
			370,000		370,000			TERMINAL APRON EXPANSION (ASPHALT)
2002	197,264	1,020,474	593,000	533,700		59,300	684,585	FIRE STATION EXPANSION
			235,000	211,500		23,500	473,085	FRONT END LOADER/RAMP PLOW
2003	203,428	1,053,390					1,526,475	
2004	209,592	1,086,306					2,612,781	
2005	215,756	1,119,221	3,225,000	2,902,500		322,500	829,502	TERMINAL APRON EXPANSION (CONCRETE)
2006	221,920	1,152,137	750,000	675,000		75,000	1,306,639	EXPAND MAINTENANCE BUILDING
2007	228,084	1,185,053	2,325,000	2,092,500		232,500	399,192	EXPAND TERMINAL ACCESS ROAD & G.A. APRON
								DEVELOP ACCESS ROAD TO SECONDARY STANDARDS
								MODIFY STORM DRAINAGE HANGAR & FUEL FARM AREAS
2008	234,248	1,217,969					1,617,160	
2009	240,412	1,250,884	2,185,000	1,966,500		218,500	901,545	OVERLAY TAXIWAY SYSTEM
2010	246,576	1,283,800	1,350,000	1,215,000		135,000	970,345	OVERLAY RUNWAY 12-30
2011	252,740	1,316,716	950,000	855,000		95,000	1,432,061	DEVELOP 3-21 TO BII STANDARDS
2012	258,904	1,349,632	2,745,000	2,470,500		274,500	311,192	EXTEND 12-30 TO 10,500
2013	265,068	1,382,547	2,370,000	2,133,000		237,000	-439,261	EXTEND PARALLEL TAXIWAY
TOTALS			30,178,000	23,878,574	3,650,000	2,628,426		

Revised: March 3, 1993
1994 PFC Funds include $100,000 for PFC Application and Bonding Costs
2001 PFC Funds include $35,000 for Bonding Costs
* FOR THIS ITEM TO BE COMPLETED AIP DISCRETIONARY FUNDS ARE NECESSARY

ECONOMIC FEASIBILITY

Federal Funding

FAA Enplanement Funds

As illustrated in Table 6-5, construction projects have been scheduled to maximize the use of FAA entitlement funds.

FAA discretionary funds may be available for future airside security, safety and runway/taxiway extension or overlay projects. However, the availability of discretionary funds does not affect financial feasibility, it only affects project scheduling in that projects can be accelerated if discretionary funds are available.

The economic analysis also assumes current FAA assistance programs will be extended by future federal legislation. The FAA Trust Fund has been in existence for 20 years, and given the demands for increases in airport capacity over the next 20 years, it is expected the FAA programs will continue.

Passenger Facility Charges

The Airport Authority has determined that Passenger Facility Charges will be used to pay the local matching share of the proposed terminal expansion project, as well as the construction of the PFC eligible terminal areas, which are not eligible for FAA enplanement funds. The new AIP legislation has changed the fundability of terminal projects at non-HUB airports. Although the funding level has increased with the new bill the percentages listed above do not vary due to the limited amount of entitlements available to the airport.

Of the estimated 12.1 million dollar terminal building construction project, FAA entitlement funds will pay about 64% of the project cost and PFC funds about 30% of the cost. Local funds will pay 6% of the terminal building cost for those areas, which are not eligible for AIP Enplanement or PFC funding.

Based on 65% of the enplaned passengers paying a $3.00 fee, and using the lower limit of projected passenger enplanements, Passenger Facility Charges will be required for a period of about 15 years.

Revenue Bond Issues

Discussions with bond underwriters indicate that Revenue Bond Issues repaid from the Gross Revenues of the Authority are a viable means of financing the airport share of the terminal construction cost, including that portion which will be financed

with annual PFC funding.

Due to the fact that PFC's are new, and few, if any, bond issues have been sold where only PFC funds have been pledged to retire a bond issue, Bond Underwriters are not recommending a Bond Issue which would be repaid solely by PFC funds.

The 1976 Bond Resolution permits the Authority to issue additional Revenue Bonds to pay for costs or improvement, reconstruction or expansion of the Airport. The 1976 Bond Resolution requires:

1. A certificate by a consulting engineer, stating that the additional funds plus funds on hand are sufficient to pay estimated cost of construction.

2. A certificate by an airport consultant, stating that the estimated new revenues during the first full fiscal year next following the date of issue of the additional Bonds and the estimated completion date on capital expenditures financed will equal either a) at least 130% of the total amount of principal and interest to become due during the same year on such outstanding Bonds and on the additional Bonds or b) in the event the Board of County Commissioners of Gallatin County by resolution covenant to levy a general tax on all taxable property in the County for payment of deficiencies in the net revenues pledged to the payment of the outstanding and additional Bonds and the electors of the County voting thereon, approve such resolution, *at least 100%* of the total amount of principal and interest to become due during the same year on such outstanding Bonds and on the additional Bonds.

3. A certificate signed by a certified public accountant, stating that net revenues of the then immediately preceding full fiscal year had been received in the amount required and that there are no deficiencies in any of the accounts of the Airport Fund.

Since Tax Backed Revenue Bonds are not anticipated, the Bond Coverage of 130% on both the 1976 and new Bond Issues will be required.

Bond underwriters have indicated that 20 year General Obligation Bonds would carry an interest rate of about 6.0%, and 20 year Airport Revenue Bonds an interest rate of about 7.5%. Bond Term affects interest rates slightly, with 10 year bonds bearing a rate of about 0.5 percent less than 20 year bonds, and 15 year bonds about 0.25 percent less.

The difference in interest is somewhat deceiving. The true cost of borrowing includes underwriting and legal fees, therefore the interest rate differential narrows when underwriting and legal fees are considered. Far more important is the fact that total interest paid for a 10 year bond is much less than the interest paid over the life of 20 year bonds.

Several bond sale scenarios were looked at, including varying terms, total number of bond issues, the possibility of borrowing funds from the reserve fund and repaying with PFC funds after an initial Phase I Bond Issue, and combining the Bond Issue for Phase I and II.

Combining a Bond Issue for the Phase I and II Improvements (1993 and 1995), and having a second bond issue in 2001 for the Phase III Improvements is recommended for the following reasons:

1. Combining the first two Bond Issues reduces underwriting, legal and administrative fees. Underwriting fees, depending on the size of the issue, will be 3 to 4%, and legal and administrative fees could be $10,000 to $20,000.

2. Use of a 15 year Bond in 1993 and a 10 year Bond in 2001 results in bond payments approximating estimated PFC income.

3. Total length of time to finance the projects with PFC funds was approximately 15 years in all scenarios.

4. Investment of bond proceeds required for Phase II will partially offset interest payments on the debt.

Table 6-6 illustrates the Recommended Bond Issue. An interest rate of 7.5% was used for the 10 year bonds in 2001 and 7.75% was used for the 15 year bonds in 1993. Excess funds from PFC revenues were invested at an interest rate of 4.0%.

The Bond Issues do not include funding of additional reserve funds or capitalization of interest. It is anticipated that current reserve funds will be reallocated to provide a one year's principal and interest reserve, and that capitalization of interest will not be required as PFC fund collection will start at about the same time Bonds are sold.

It should be noted that $320,000 of PFC funding was projected to be used for Terminal Apron Improvements in 2001 when the terminal is expanded.

Use of PFC funds for the apron will not be required if: (1) estimated AIP enplanement income exceeds projections, or (2) AIP discretionary funds are available.

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TABLE 6-6

PROPOSED BOND ISSUES - PASSENGER TERMINAL ADDITIONS
ESTIMATED DEBT RETIREMENT COSTS - 1993 BOND ISSUE 7.75% INTEREST RATE
- 2001 BOND ISSUE 7.50% INTEREST RATE
INVESTEMENT INTEREST - 4.0%

			PHASE I AND II CONSTRUCTION 1993 REVENUE BOND ISSUE				PHASE III CONSTRUCTION 2001 BOND ISSUE				TOTAL	
FISCAL YR END	EST CY PASS'GERS	EST PFC INCOME	REMAIN'G PRIN'PAL	PRIN'PAL PAYMENT	INTEREST PAYMENT	TOTAL PAYMENT	REMAIN'G PRIN'PAL	PRIN'PAL PAYMENT	INTEREST PAYMENT	TOTAL PAYMENT	ALL BOND ISSUES	*** PFC BALANCE
BUDG 92	141,898		0	0	0	0					0	0
BUDG 93	153,812		0	0	0	0					0	0
1994	150,000	292,500	2,550,000	90,000	197,625	287,625					287,625	4,875
1995	155,635	303,488	2,460,000	115,000	190,650	305,650					305,650	2,908
1996	161,270	314,477	2,345,000	135,000	181,738	316,738					316,738	764
1997	167,236	326,110	2,210,000	135,000	171,275	306,275					306,275	20,629
1998	173,202	337,744	2,075,000	175,000	160,813	335,813					335,813	23,386
1999	179,168	349,378	1,900,000	185,000	147,250	332,250					332,250	41,449
2000	185,134	361,011	1,715,000	185,000	132,913	317,913					317,913	86,206
2001	191,100	372,645	1,530,000	175,000	118,575	293,575	1,100,000	60,000	82,500	142,500	436,075	26,224
2002	197,264	384,665	1,355,000	165,000	105,013	270,013	1,040,000	60,000	78,000	138,000	408,013	3,925
2003	203,428	396,685	1,190,000	165,000	92,225	257,225	980,000	70,000	73,500	143,500	400,725	42
2004	209,592	408,704	1,025,000	185,000	79,438	264,438	910,000	80,000	68,250	148,250	412,688	-3,940
2005	215,756	420,724	840,000	195,000	65,100	260,100	830,000	90,000	62,250	152,250	412,350	4,277
2006	221,920	432,744	645,000	210,000	49,988	259,988	740,000	100,000	55,500	155,500	415,488	21,705
2007	228,084	444,764	435,000	215,000	33,713	248,713	640,000	130,000	48,000	178,000	426,713	40,624
2008	234,248	456,784	220,000	220,000	17,050	237,050	510,000	170,000	38,250	208,250	445,300	53,733
2009	240,412	468,803	0	0	0	0	340,000	170,000	25,500	195,500	195,500	329,185
2010	246,576	480,823	0	0	0	0	170,000	170,000	12,750	182,750	182,750	640,426
2011	252,740	0					0					
2012	258,904	0										
2013	265,068	0										
	TOTAL	6,552,049				4,293,363				1,644,500	5,937,863	

*** Interest computed as 4% of previous year balance.
Revised: 3/03/93

Estimated Income and Expenses FY 1994 to FY 2013

The aviation forecasts in Chapter 2, along with current lease policies, provide the basis for estimating airport income through the study period. Historic expense data adjusted for the terminal building additions was used as the basis of projecting Operations and Maintenance costs (O & M).

The 1976 Gallatin Field Airport Use Agreement and Lease of Premises with the Airlines serving the Airport will expire in 1998, 20 years after the present terminal building was occupied. Is has been assumed that the current airline operating agreement will be extended in more or less its current form for another 20 years in 1998 when it comes up for renewal and renegotiation. (Almost identical operating agreements are in place in Helena and Missoula, and rates at Butte are computed in a similar manner. Billings and Great Falls have somewhat different use agreements.)

This use agreement established weight - frequency formulas for the determination of airline landing fees. The airlines percent of landed weight is used to determine the airlines' share of facilities designed for air carriers and the airlines' percent of departures is used to determine the airlines' share of facilities used for general aviation.

For Airside Maintenance and Operation and Airside Capital Expense Items, the airlines share is determined by using the average percentage of departures and weight.

In the Terminal Cost Center, the airlines' share of debt retirement, maintenance and operations, and capital improvements is also based on a formula. This formula states that the airlines' percentage of the Terminal Cost Center is the total leased Airline Exclusive Use Space plus total based Airline Common Use Space, plus 25% of the public space, divided by the combined total of Airline, Revenue and Public Space.

Under the terms of the operating agreement, the Airlines have "budget approval" of expenses included in their rate base. The 1976 Bond Issue is included in the rate base. Subsequent bond issues will require Airline approval. (The airlines must be consulted prior to establishing a PFC, however airline approval is not required by the FAA to approve establishment of a PFC.)

In estimating costs, an inflation factor of 4.0% annually has been assumed. Since the Airline Rate Base is a function of costs, Airline Fees will generally increase as costs increase.

General Aviation and other income amounts are a function of growth in traffic in future years, as well as a function of future rates and charges negotiated by the Authority.

Assumptions used to estimate these fees are discussed in the following sections.

Projected Operation and Maintenance Expenses

Table 6-7 shows the Projected Operation and Maintenance Expenses for each cost center and allocates Administrative Expenses to the Reimbursed Expense, Airside, General Aviation/Commercial and Terminal Cost Centers in accordance with the Airline Operating Agreement and current accounting practices.

Reimbursed costs are not budgeted or anticipated during the study period. Reimbursed costs are one of the cost centers recognized by the Airline Operating Agreement.

The 1993 Budget was used as a basis for projecting Operations and Maintenance Costs. In 1995, when the first terminal addition will be occupied, in the Terminal Cost Center, non-labor costs were increased in direct proportion to the square footage increase. Labor costs were not increased in 1995, as Airport Management has determined the existing staff is capable of handling the added work without increasing staff. In 1997 and 2001, Terminal Cost Center costs including labor costs, were increased in direct proportion to the square footage as increased staff will be required when these additions are constructed.

An inflation rate of 4% per year was utilized to estimate O & M costs throughout the 20 year period.

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TABLE 6-7

GALLATIN FIELD TERMINAL ADDITION

PROJECTED OPERATION AND MAINTENANCE EXPENSES
Four Percent (4.0%) Inflation

FISCAL YR END		ADMIN COSTS	REIMBURSED COSTS	AIRSIDE COSTS	GA/COMM COSTS	TERMINAL COSTS	TOTAL O & M COSTS	** ADMIN ALLOCATED TO COST CENTERS ** REIMBURSED COSTS	AIRSIDE COSTS	GA/COMM COSTS	TERMINAL COSTS	TOTAL O & M COSTS
BUDG 92		160,709	0	252,935	94,308	215,358	723,310	0	325,187	121,247	276,876	723,310
BUDG 93		178,539	0	257,585	90,644	211,426	738,194	0	339,759	119,561	278,874	738,194
1994		185,681	0	267,888	94,270	219,883	767,722	0	353,349	124,343	290,029	767,722
1995	Note 1	193,108	0	278,604	98,041	304,950	874,702	0	357,537	125,817	391,348	874,702
1996		200,832	0	289,748	101,962	317,148	909,691	0	371,839	130,850	407,002	909,691
1997	Note 2	208,865	0	301,338	106,041	419,658	1,035,903	0	377,440	132,821	525,642	1,035,903
1998		217,220	0	313,392	110,282	436,445	1,077,339	0	392,537	138,134	546,667	1,077,339
1999		225,909	0	325,927	114,694	453,903	1,120,432	0	408,239	143,659	568,534	1,120,432
2000		234,945	0	338,964	119,281	472,059	1,165,249	0	424,569	149,405	591,275	1,165,249
2001	Note 3	244,343	0	352,523	124,053	622,809	1,343,727	0	430,873	151,624	761,231	1,343,727
2002		254,117	0	366,624	129,015	647,721	1,397,476	0	448,108	157,689	791,680	1,397,476
2003		264,281	0	381,289	134,175	673,630	1,453,375	0	466,032	163,996	823,347	1,453,375
2004		274,853	0	396,540	139,542	700,575	1,511,510	0	484,673	170,556	856,281	1,511,510
2005		285,847	0	412,402	145,124	728,598	1,571,971	0	504,060	177,378	890,532	1,571,971
2006		297,281	0	428,898	150,929	757,742	1,634,850	0	524,222	184,474	926,154	1,634,850
2007		309,172	0	446,054	156,966	788,052	1,700,243	0	545,191	191,852	963,200	1,700,243
2008		321,539	0	463,896	163,245	819,574	1,768,253	0	566,999	199,527	1,001,728	1,768,253
2009		334,400	0	482,452	169,775	852,357	1,838,983	0	589,679	207,508	1,041,797	1,838,983
2010		347,776	0	501,750	176,565	886,451	1,912,543	0	613,266	215,808	1,083,469	1,912,543
2011		361,687	0	521,820	183,628	921,909	1,989,044	0	637,797	224,440	1,126,807	1,989,044
2012		376,155	0	542,693	190,973	958,785	2,068,606	0	663,309	233,418	1,171,880	2,068,606
2013		391,201	0	564,400	198,612	997,137	2,151,350	0	689,841	242,755	1,218,755	2,151,350

** Administrative costs allocated in direct proportion to cost center costs less reimbursed costs.
Reimbursed costs are reimbursed without any allocation of administrative costs.

Note 1: Terminal Cost Center Budget increased 38.7%, increase in Revenue and Public Area square footage = 71.1%
Note 2: Terminal Cost Center Budget increased 32.3%, increase in Revenue and Public Area square footage = 27.2%
Note 3: Terminal Cost Center Budget increased 31.9%, increase in Revenue and Public Area square footage = 26.7%
Center Pier First Floor area excluded from rate base computations.

Revised: 3/03/93

Debt Retirement and Capital Improvement

Table 6-8 shows the Allocation of Debt and Capital Improvements to Cost Centers.

The 1976 Bonds and the 1985 Montana Division of Aeronautics Loans have been included in the Airlines and GA rate bases in accordance with the Airline Operating Agreement.

The 1993 and 2001 Bond Issues have been allocated to a Passenger Facility Cost Center and not included in the Airlines Rate Base.

Capital Improvements have been allocated to each cost center and an "Unallocated Capital Cost" center. The Unallocated Capital Improvements are those which are not included in the Airline or GA rate bases.

During the past five years, as the reserve fund size has increased to over three million dollars, most non-AIP Capital Improvement Projects have been excluded from the rate base and have been financed almost exclusively from interest on the reserve funds. Some AIP projects have also been excluded from the rate bases.

The Bond Reserve fund required by the 1976 Bond Resolution is equal to half the bond and principal payments due for the year plus the maximum payment due.

In order to be in compliance with Airport Bond Resolutions, the Minimum Bond Reserve will be approximately as follows:

FY 1993 through FY 2000	$ 850,000
FY 2001 through FY 2008	$ 690,000
FY 2009 through FY 2010	$ 300,000

Total Capital Improvement Costs, excluding Federal Participation during the period FY 1987 through FY 1993, have been:

Fiscal Year	Total Capital Improvement Excluding Federal Funds	
	AIP Projects	Non-AIP
1987	51,523	44,870
1988	7,335	85,260
1989	169,769	98,561
1990	39,876	177,230
1991	55,177	58,139
1992 (First 9 months)	6,079	325,046
1993 (Budget)	40,000	141,000
Average	52,823	132,872

During the study period, 1993 through 2013, $2,459,928 is required to match federal funds. Excluding the $705,128 required for the terminal building project, the average amount required over the study period is $100,000 per year. From FY 2000 through FY 2013, the average is $128,000 per year.

The following assumptions were used to estimate and allocate Capitol Improvement Costs:

(1) The Airlines would permit inclusion of Air Carrier Air side costs in their rate base. These airside costs are scheduled in the year shown in Table 6-5.

(2) A nominal $10,000, with adjustments for inflation, has been included in the GA/Commercial Cost Center except in the years when major improvements are proposed in GA facilities. The local share of those improvements has been allocated to the "Unallocated Capital Improvements" cost center and will be paid from the Reserve Fund.

(3) A similar assumption was made for the Terminal Cost Center. A nominal $12,000, with adjustments for inflation, has been budgeted except in FY 2005 when major improvements to terminal access are completed.

In FY 1994, 1997 and 2001, local costs associated with the terminal expansion are included in the "Unallocated Capital Improvements" cost center and will be paid from reserve funds.

(4) The Unallocated Capital Improvements is based on a budget of $100,000 per year with adjustments for inflation and the Capital Improvement Costs discussed above. $100,000 was used as the base even though the average during the last seven years was distorted by FY 90, 92 and 93 expenditures.

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TABLE 6-8

GALLATIN FIELD TERMINAL ADDITION

ALLOCATION OF DEBT AND CAPITAL IMPROVEMENT TO COST CENTERS

	AERONAUTICS LOANS AND BOND ISSUE REPAYMENT SCHEDULES						** DEBT COSTS ALLOCATED TO COST CENTERS **					*** CAPITAL IMPROVEMENT COST ALLOCATION ***				
FISCAL YR END	1976 BONDS	1/85 MDA LOAN	7/85 MDA LOAN	1993 BONDS	2001 BONDS	TOTAL PAYMENT	AIRSIDE COSTS	GA/COMM COSTS	TERMINAL COSTS	PASS'GR FAC COST	TOTAL PAYMENT	AIRSIDE COSTS	GA/COMM COSTS	TERMINAL COSTS	UNALLOC'TD CAP IMP	TOTAL CAP IMP
BUDG 92	225,160	12,204	10,576	0	0	247,940	59,270	8,543	180,128	0	247,940	3,600	1,208	20,524	305,793	331,125
BUDG 93	227,210	12,383	10,731	0	0	250,324	59,888	8,668	181,768	0	250,324	0	40,000	11,832	141,000	192,832
1994	228,570	12,475	10,811	287,625	0	539,481	60,268	8,732	182,856	287,625	539,481	0	10,000	12,000	744,399	766,399
1995	229,220	12,480	10,816	305,650	0	558,166	60,404	8,736	183,376	305,650	558,166	40,000	10,400	12,480	104,000	166,880
1996	229,140	0	0	316,738	0	545,878	45,828	0	183,312	316,738	545,878	0	10,816	12,979	108,160	131,955
1997	228,310			306,275	0	534,585	45,662		182,648	306,275	534,585	0	11,249	13,498	198,213	222,960
1998	231,710			335,813	0	567,523	46,342		185,368	335,813	567,523	30,000	11,699	14,038	116,986	172,723
1999	234,025			332,250	0	566,275	46,805		187,220	332,250	566,275	52,500	12,167	14,600	121,665	200,932
2000	0			317,913	0	317,913	0		0	317,913	317,913	0	12,653	15,184	126,532	154,369
2001				293,575	142,500	436,075				436,075	436,075	0	13,159	15,791	231,593	260,544
2002				270,013	138,000	408,013				408,013	408,013	82,800	13,686	16,423	136,857	249,765
2003				257,225	143,500	400,725				400,725	400,725	0	14,233	17,080	142,331	173,644
2004				264,438	148,250	412,688				412,688	412,688	0	14,802	17,763	148,024	180,590
2005				260,100	152,250	412,350				412,350	412,350	322,500	0	0	153,945	476,445
2006				259,988	155,500	415,488				415,488	415,488	75,000	16,010	19,212	160,103	270,326
2007				248,713	178,000	426,713				426,713	426,713	232,500	16,651	19,981	166,507	435,639
2008				237,050	208,250	445,300				445,300	445,300	0	17,317	20,780	173,168	211,265
2009				0	195,500	195,500				195,500	195,500	218,500	18,009	21,611	180,094	438,215
2010					182,750	182,750				182,750	182,750	135,000	0	22,476	313,298	470,774
2011												95,000	19,479	23,375	194,790	332,644
2012												274,500	20,258	24,310	202,582	521,650
2013												237,000	21,068	25,282	210,685	494,036

Note: 1994 Unallocated Capital Improvement Includes $644,399 Payment from Reserve Fund for Terminal Building Addition
Note: 1997 Unallocated Capital Improvement Includes $ 85,727 Payment from Reserve Fund for Terminal Building Addition
Note: 2001 Unallocated Capital Improvement Includes $100,000 Payment from Reserve Fund for Terminal Building Addition
Revised: 3/03/93

Airside Revenues and Expenses

Table 6-9 summarizes Airside Revenue and Expenses.

Airline Landing Fee revenues are based on the current weight frequency percentages which are not expected to vary significantly throughout the study period.

Airline Financial Responsibility

A.C. Debt Retirement	92%
Maintenance and Operation	65%
G.A. Debt Retirement	37% *

* Not used in analysis as not applicable for proposed improvements.

GA Landing Fees have historically averaged 11% of Air Carrier fees, and this percentage was used throughout the study period.

GA Fuel Flowage, Tiedown Fees and Miscellaneous income was projected to increase at about one (1) percent a year throughout the study period. One percent a year was chosen because of the low growth rate projected for general aviation. No adjustment in rates was made. However, it has been some time since rates were adjusted, and Gallatin Field fuel flowage and tiedown fees are at the lower end of fees charged to General Aviation by Montana Air Carrier Airports. These fees are reviewed on a periodic basis by the Authority, and adjustments should be considered during the study period to keep GA fees in line with fees paid by Air Carriers.

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TABLE 6-9

GALLATIN FIELD TERMINAL ADDITION
PROJECTED AIRSIDE REVENUE AND EXPENSES
(Four Percent Inflation)

FISCAL YR END	TOTAL AIRSIDE O&M	TOTAL AIRSIDE CAP IMPR	TOTAL AIRSIDE DEBT	AIRLINE LANDING FEES	GA/COMM LANDING FEES	GA FUEL FLOWAGE	GA TIEDOWN FEES	MISC INCOME	TOTAL AIRSIDE REVENUE	TOTAL AIRSIDE COSTS
BUDG 92	325,187	3,600	59,270	266,732	30,848	9,000	3,220	5,700	315,500	388,056
BUDG 93	339,759	0	59,888	263,858	29,934	9,000	3,410	5,050	311,252	399,647
1994	353,349	0	60,268	285,123	31,364	9,090	3,444	5,101	334,121	413,617
1995	357,537	40,000	60,404	313,971	34,537	9,181	3,479	5,152	366,319	457,941
1996	371,839	0	45,828	283,857	31,224	9,273	3,513	5,203	333,070	417,667
1997	377,440	0	45,662	287,345	31,608	9,365	3,548	5,255	337,122	423,102
1998	392,537	30,000	46,342	317,284	34,901	9,459	3,584	5,308	370,536	468,879
1999	408,239	52,500	46,805	342,541	37,680	9,554	3,620	5,361	398,755	507,544
2000	424,569	0	0	275,970	30,357	9,649	3,656	5,414	325,046	424,569
2001	430,873	0	0	280,067	30,807	9,746	3,693	5,468	329,781	430,873
2002	448,108	82,800	0	345,090	37,960	9,843	3,729	5,523	402,146	530,908
2003	466,032	0	0	302,921	33,321	9,942	3,767	5,578	355,529	466,032
2004	484,673	0	0	315,038	34,654	10,041	3,804	5,634	369,171	484,673
2005	504,060	322,500	0	537,264	59,099	10,141	3,842	5,690	616,037	826,560
2006	524,222	75,000	0	389,495	42,844	10,243	3,881	5,747	452,210	599,222
2007	545,191	232,500	0	505,499	55,605	10,345	3,920	5,805	581,174	777,691
2008	566,999	0	0	368,549	40,540	10,449	3,959	5,863	429,360	566,999
2009	589,679	218,500	0	525,316	57,785	10,553	3,998	5,922	603,574	808,179
2010	613,266	135,000	0	486,373	53,501	10,659	4,038	5,981	560,552	748,266
2011	637,797	95,000	0	476,318	52,395	10,765	4,079	6,041	549,598	732,797
2012	663,309	274,500	0	609,576	67,053	10,873	4,120	6,101	697,722	937,809
2013	689,841	237,000	0	602,447	66,269	10,982	4,161	6,162	690,020	926,841

Revised: 3/03/93

GA/Commercial Revenue and Expenses

Table 6-10 shows projected General Aviation and Commercial Revenue and Expenses.

Revenue sources include the Old Terminal, FAA Sector and FBO building rentals, hangar rents and ground leases.

All of the Authority leases contain provisions for rate renegotiation, generally on a five year frequency.

Gallatin Field rates are at the low end of rates charged in the State, therefore, the Authority should review rates during the lease renegotiation periods and increase fees if appropriate.

The projections are based on a 5% fee increase every five years. In order to balance projected revenue with expenses, an increase of about 15% every five years would be required.

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TABLE 6-10

GALLATIN FIELD TERMINAL ADDITION
PROJECTED GA/COMMERCIAL REVENUE AND EXPENSES
(Four Percent Inflation)

FISCAL YR END	TOTAL GA/COMM O&M	TOTAL GA/COMM CAP IMPR	TOTAL GA/COMM DEBT	OLD TERMINAL RENT	FAA SECTOR OFFICE	FBO BUILDING LEASE	HANGAR RENTS	GROUND LEASES	TOTAL GA/COMM REVENUE	TOTAL GA/COMM COSTS
BUDG 92	121,247	1,208	8,543	62,513	36,450	17,315	4,621	37,100	157,999	130,998
BUDG 93	119,561	40,000	8,668	61,424	25,808	17,315	4,620	37,170	146,337	168,229
1994	124,343	10,000	8,732	62,000	26,000	17,315	4,620	37,200	147,135	143,075
1995	125,817	10,400	8,736	62,000	26,000	17,315	4,620	37,200	147,135	144,953
1996	130,850	10,816	0	62,000	26,000	17,315	4,620	37,200	147,135	141,666
1997	132,821	11,249	0	65,100	27,300	18,181	4,851	39,060	154,492	144,070
1998	138,134	11,699	0	65,100	27,300	18,181	4,851	39,060	154,492	149,832
1999	143,659	12,167	0	65,100	27,300	18,181	4,851	39,060	154,492	155,826
2000	149,405	12,653	0	65,100	27,300	18,181	4,851	39,060	154,492	162,059
2001	151,624	13,159	0	65,100	27,300	18,181	4,851	39,060	154,492	164,783
2002	157,689	13,686	0	68,355	28,665	19,090	5,094	41,013	162,216	171,374
2003	163,996	14,233	0	68,355	28,665	19,090	5,094	41,013	162,216	178,229
2004	170,556	14,802	0	68,355	28,665	19,090	5,094	41,013	162,216	185,359
2005	177,378	0	0	68,355	28,665	19,090	5,094	41,013	162,216	177,378
2006	184,474	16,010	0	68,355	28,665	19,090	5,094	41,013	162,216	200,484
2007	191,852	16,651	0	71,773	30,098	20,044	5,348	43,064	170,327	208,503
2008	199,527	17,317	0	71,773	30,098	20,044	5,348	43,064	170,327	216,843
2009	207,508	18,009	0	71,773	30,098	20,044	5,348	43,064	170,327	225,517
2010	215,808	0	0	71,773	30,098	20,044	5,348	43,064	170,327	215,808
2011	224,440	19,479	0	71,773	30,098	20,044	5,348	43,064	170,327	243,919
2012	233,418	20,258	0	75,361	31,603	21,046	5,616	45,217	178,844	253,676
2013	242,755	21,068	0	75,361	31,603	21,046	5,616	45,217	178,844	263,823

Revised: 3/03/93

Note: Revenue increased five percent every five years

Terminal Revenue and Expenses

Table 6-11 shows projected Terminal Revenue and Expenses.

Airline rent was based on the Airline Operating Agreement, as follows:

- 57% of the Terminal Debt (1976 Bonds) was included in airline rent.

- The Airline percentage of O&M Costs and Capital improvement costs included in airline rent used in the analysis was:

56%	FY 1994
48%	FY 1995 - 98
56%	FY 1999 - 2001
58%	FY 2002 - 13

The restaurant lounge income was projected to increase at about one (1) percent per year, following occupancy of their new quarters. This allows the concessionaire an adequate time to amortize the cost of the move and purchase of additional equipment.

The major revenue producers in the terminal are the rental car, other concessions and auto parking concessionaires. Revenue from these sources can be equated to an estimated amount of revenue per enplaned passenger.

The revenue projections use the following:

- Rental Car Revenue per enplaned passenger averaged about $2.23 per passenger from FY 88 through FY 91. For FY 92 and FY 93, using current enplaned passenger estimates, the revenue per passenger will be about $2.67.

  The projected revenue is based on $2.35 per passenger, with the rate adjusted annually at 2%. The rate increase is one-half the 4% rate estimated for inflation.

- Other Concession Revenue per enplaned passenger averaged about 33¢ from FY 87 through FY 91, and is estimated to average about 40¢ in FY 92 and FY 93.

  The projected revenue is based on $0.40 per enplaned passenger with the rate increased at 2% per year.

- Car Parking Revenue which averaged close to 48¢ per passenger in FY 88 through FY 91, has increased to about

74¢ per passenger in 1992 due to rate adjustments. Per passenger revenues are not as subject to inflationary pressure because parking rates are generally not adjusted on a frequent basis.

The projected car parking revenue is based on $0.72 per enplaned passenger throughout the study period.

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TABLE 6-11

GALLATIN FIELD TERMINAL ADDITION
PROJECTED TERMINAL REVENUE AND EXPENSES
(Four Percent Inflation)

FISCAL YR END	EST CAL YR ENPLANED PASS'GERS	TOTAL TERMINAL O & M	TOTAL TERMINAL CAP IMPRV	TOTAL TERMINAL DEBT	AIRLINE RENT	CAFE LOUNGE	RENTAL CAR CONS FEE	MISC TERM & OTHER CONCESS	AUTO PARKING	TOTAL TERMINAL REVENUE	TOTAL TERMINAL COSTS
BUDG 92	141,898	276,876	20,524	180,128	273,767	13,500	316,000	40,267	68,250	711,784	477,528
BUDG 93	153,812	278,874	11,832	181,768	271,534	14,500	380,320	61,040	104,000	831,394	472,474
1994	150,000	290,029	12,000	182,856	271,536	14,790	359,550	61,200	108,000	815,076	484,885
1995	155,635	391,348	12,480	183,376	281,858	17,748	373,057	63,499	112,057	848,219	587,204
1996	161,270	407,002	12,979	183,312	289,581	17,925	386,564	65,798	116,114	875,983	603,293
1997	167,236	525,642	13,498	182,648	346,458	18,105	400,865	68,232	120,410	954,070	721,788
1998	173,202	546,667	14,038	185,368	358,115	18,286	415,165	70,666	124,705	986,938	746,074
1999	179,168	568,534	14,600	187,220	431,398	18,469	429,466	73,101	129,001	1,081,434	770,354
2000	185,134	591,275	15,184	0	339,617	18,653	443,766	75,535	133,296	1,010,868	606,459
2001	191,100	761,231	15,791	0	435,132	18,840	458,067	77,969	137,592	1,127,600	777,022
2002	197,264	791,680	16,423	0	468,700	19,028	472,842	80,484	142,030	1,183,083	808,103
2003	203,428	823,347	17,080	0	487,448	19,219	487,617	82,999	146,468	1,223,750	840,427
2004	209,592	856,281	17,763	0	506,945	19,411	502,392	85,514	150,906	1,265,168	874,044
2005	215,756	890,532	0	0	516,509	19,605	517,167	88,028	155,344	1,296,653	890,532
2006	221,920	926,154	19,212	0	548,312	19,801	531,942	90,543	159,782	1,350,381	945,366
2007	228,084	963,200	19,981	0	570,245	19,999	546,717	93,058	164,220	1,394,240	983,181
2008	234,248	1,001,728	20,780	0	593,055	20,199	561,492	95,573	168,659	1,438,978	1,022,508
2009	240,412	1,041,797	21,611	0	616,777	20,401	576,268	98,088	173,097	1,484,630	1,063,408
2010	246,576	1,083,469	22,476	0	641,448	20,605	591,043	100,603	177,535	1,531,233	1,105,944
2011	252,740	1,126,807	23,375	0	667,106	20,811	605,818	103,118	181,973	1,578,825	1,150,182
2012	258,904	1,171,880	24,310	0	693,790	21,019	620,593	105,633	186,411	1,627,446	1,196,190
2013	265,068	1,218,755	25,282	0	721,542	21,229	635,368	108,148	190,849	1,677,135	1,244,037

Revised: 3/03/93

Projected Cash Flow

Table 6-12 shows the Projected Cash Flow for the Terminal Addition and other recommended improvements during the study period.

Using the revenues and expenses projected in the previous tables, the proposed improvements are feasible assuming the airlines are willing to commit to the projected landing fees and rents, and assuming bonds can be sold.

In 2013, after adjusting for inflation, it is projected that airline landing fees will be approximately the same as those projected for 1994.

Airline terminal rents will raise from the present $271,000 per year to $721,000 per year in 2013, almost triple. This is due to the increase in area rented. However, the average terminal rental rate decreases from approximately $16.83 s.f. to $15.74 per square foot in the expanded terminal.

With adjustments for inflation, the $721,000 in 2013 represents $329,000 in 1994 dollars. The $15.21/sq. ft. equates to $6.95/sq. ft in 1994 dollars.

Other income includes interest income from the Bond Reserve Fund and other Authority cash reserves.

Revenue Bond Coverage (Net Revenue in Excess of Bond Issue Payments) is adequate. Coverage of 100% in the case of Tax Backed Revenue Bonds and 130% for standard Revenue bonds is required. Bond coverage, with appropriate adjustments for Capital Outlay, exceeds 160%. (Generally, an adjustment can be made for Capital Outlay expenses when computing coverage. Bond Covenants normally require O&M and debt to be paid prior to committing funds for Capital Outlay). Final cash flow projections will need to be computed in accordance with the criteria of the Bond Fiscal Advisor and Bond Counsel selected by the Gallatin Airport Authority.

The "Cash Balance" column includes Bond Reserve funds. This column shows the reserve will continue to increase throughout the study period. However, in 1994 dollars, there is virtually no increase when inflation is considered.

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TABLE 6-12

GALLATIN FIELD TERMINAL ADDITION
PROJECTED CASH FLOW FY 1992-FY 2013

FISCAL YR END	PROJECTED REVENUE: AIRSIDE	AIRLINE TERMINAL	GA/COMM	PASSG'R FAC CHRG	OTHER & INTEREST	TOTAL REVENUES	O & M AND CAPITAL IMPROVEMENT: TOTAL O & M	TOTAL CAP IMPRV	TOTAL EXPENSES	NET REVENUE	PLUS CAPITAL OUTLAY	ADJUSTED NET INCOME	BOND ISSUE PAYMENTS	BOND PERCENT COVERAGE	LESS NET INCOME CAPITAL OUTLAY	AFTER BOND CAP IMPR	CASH BALANCE
																	3,107,000
BEGINNING CASH BALANCE 7/1/91																	
BUDG 92	315,500	711,784	157,999	0	195,060	1,380,343	723,310	331,125	1,054,435	325,908	331,125	657,033	247,940	265	331,125	77,968	3,184,968
BUDG 93	311,252	831,394	146,337	0	158,090	1,447,073	738,194	192,832	931,026	516,047	192,832	708,879	250,324	283	192,832	265,723	3,450,691
1994	334,121	815,076	147,135	292,500	138,028	1,726,860	767,722	766,399	1,534,121	192,739	766,399	959,138	539,481	178	766,399	-346,742	3,103,949
1995	366,319	848,219	147,135	303,488	124,158	1,789,319	874,702	166,880	1,041,582	747,737	166,880	914,617	558,166	164	166,880	189,571	3,293,520
1996	333,070	875,983	147,135	314,477	131,741	1,802,406	909,691	131,955	1,041,646	760,760	131,955	892,715	545,878	164	131,955	214,882	3,508,402
1997	337,122	954,070	154,492	326,110	140,336	1,912,130	1,035,903	222,960	1,258,863	653,267	222,960	876,227	534,585	164	222,960	118,682	3,627,084
1998	370,536	986,938	154,492	337,744	145,083	1,994,793	1,077,339	172,723	1,250,061	744,732	172,723	917,455	567,523	162	172,723	177,209	3,804,293
1999	398,755	1,081,434	154,492	349,378	152,172	2,136,230	1,120,432	200,932	1,321,364	814,866	200,932	1,015,798	566,275	179	200,932	248,591	4,052,884
2000	325,046	1,010,868	154,492	361,011	162,115	2,013,532	1,165,249	154,369	1,319,618	693,914	154,369	848,283	317,913	267	154,369	376,001	4,428,886
2001	329,781	1,127,600	154,492	372,645	177,155	2,161,673	1,343,727	260,544	1,604,271	557,402	260,544	817,946	436,075	188	260,544	121,327	4,550,213
2002	402,146	1,183,083	162,216	384,665	182,009	2,314,119	1,397,476	249,765	1,647,242	666,877	249,765	916,642	408,013	225	249,765	258,864	4,809,077
2003	355,529	1,223,750	162,216	396,685	192,363	2,330,543	1,453,375	173,644	1,627,019	703,523	173,644	877,167	400,725	219	173,644	302,798	5,111,876
2004	369,171	1,265,168	162,216	408,704	204,475	2,409,735	1,511,510	180,590	1,692,100	717,635	180,590	898,225	412,688	218	180,590	304,947	5,416,823
2005	616,037	1,296,653	162,216	420,724	216,673	2,712,304	1,571,971	476,445	2,048,416	663,888	476,445	1,140,334	412,350	277	476,445	251,538	5,668,361
2006	452,210	1,350,381	162,216	432,744	226,734	2,624,286	1,634,850	270,326	1,905,175	719,111	270,326	989,436	415,488	238	270,326	303,623	5,971,984
2007	581,174	1,394,240	170,327	444,764	238,879	2,829,384	1,700,243	435,639	2,135,882	693,502	435,639	1,129,141	426,713	265	435,639	266,789	6,238,773
2008	429,360	1,438,978	170,327	456,784	249,551	2,745,000	1,768,253	211,265	1,979,518	765,482	211,265	976,746	445,300	219	211,265	320,182	6,558,955
2009	603,574	1,484,630	170,327	468,803	262,358	2,989,693	1,838,983	438,215	2,277,198	712,494	438,215	1,150,710	195,500	589	438,215	516,994	7,075,950
2010	560,552	1,531,233	170,327	480,823	283,038	3,025,973	1,912,543	470,774	2,383,317	642,657	470,774	1,113,431	182,750	N/A	470,774	459,907	7,535,856
2011	549,598	1,578,825	170,327	0	301,434	2,600,184	1,989,044	332,644	2,321,688	278,496	332,644	611,140	0	N/A	332,644	278,496	7,814,352
2012	697,722	1,627,446	178,844	0	312,574	2,816,586	2,068,606	521,650	2,590,256	226,330	521,650	747,979	0	N/A	521,650	226,330	8,040,682
2013	690,020	1,677,135	178,844	0	321,627	2,867,626	2,151,350	494,036	2,645,386	222,240	494,036	716,276	0	N/A	494,036	222,240	8,262,923

Note: 1994 Capital Improvement Includes $644,399 Payment from Reserve Fund for Terminal Building Addition
Note: 1997 Capital Improvement Includes $ 85,727 Payment from Reserve Fund for Terminal Building Addition
Note: 2001 Capital Improvement Includes $100,000 Payment from Reserve Fund for Terminal Building Addition
Revised: 3/03/93

SENSITIVITY ANALYSIS

The economic analysis presented in the previous sections is considered relatively conservative. To determine at what point the economic analysis would indicate the proposed projects could not be constructed, a scenario with lower enplanements was projected. In this scenario, the local share of all capital improvements was paid from reserve funds to provide a lower limit on revenues and to maximize use of current reserves.

With enplanements projected to increase at 1.5% per year, lower PFC income required stretching out the 1993 Bond Issue to a 20 year term, and the 2001 Bond Issue to a 15 year term.

Stretching out the Bond Payment Schedule resulted in about $520,000 more PFC funds being required to retire the bonds.

The use of reserve funds to pay the local share of all capital improvements resulted in lower Airside Revenue as these costs were not included in the Airline Rate Base.

Likewise, lower enplanements resulted in less revenue in the terminal cost center from rental car, parking and other concession fees.

Table 6-13 shows the Cash Flow analysis for this scenario. Bond Coverage is not affected. The Reserve Fund continues to grow from 3 million in 1993 to 4.8 million in 2013.

The above sensitivity analysis indicates that a "no growth" situation would be required to make the project infeasible. If such a situation occurred, the Authority would need to consider canceling the Phase III Terminal Improvements and reprogramming PFC funds for Airside Improvements.

The above analysis did not consider the effect of lower FAA enplanement funding, it assumed discretionary funds would be available for the proposed projects as scheduled. This allowed the local funding requirement to be the same in both scenarios.

However, if discretionary funds are not available, priorities will change and programs will need to be reevaluated.

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TABLE 6-13

GALLATIN FIELD TERMINAL ADDITION
PROJECTED CASH FLOW FY 1992-FY 2013
ASSUMING ENPLANEMENTS INCREASE AT 1.5% ANNUALLY AND
CAPITAL OUTLAY PROJECTS ARE PAID FROM RESERVE FUNDS

	PROJECTED REVENUE						O & M AND CAPITAL IMPROVEMENT										
FISCAL YR END	AIRSIDE	AIRLINE TERMINAL	GA/COMM	PASSG'R FAC CHRG	OTHER & INTEREST	TOTAL REVENUES	TOTAL O & M	TOTAL CAP IMPRV	TOTAL EXPENSES	NET REVENUE	PLUS CAPITAL OUTLAY	ADJUSTED NET INCOME	BOND ISSUE PAYMENTS	BOND PERCENT COVERAGE	LESS NET INCOME CAPITAL OUTLAY	LESS NET INCOME AFTER BOND CAP IMPR	CASH BALANCE
BEGINNING CASH BALANCE 7/1/91																	3,107,000
BUDG 92	315,500	711,784	157,999	0	195,060	1,380,343	723,310	331,125	1,054,435	325,908	331,125	657,033	247,940	265	331,125	77,968	3,184,968
BUDG 93	311,252	831,394	146,337	0	158,090	1,447,073	738,194	192,832	931,026	516,047	192,832	708,879	250,324	283	192,832	265,723	3,450,691
1994	334,121	815,076	147,135	292,500	138,028	1,726,860	767,722	766,399	1,534,121	192,739	766,399	959,138	539,481	178	766,399	-346,742	3,103,949
1995	366,319	836,287	147,135	296,888	124,158	1,770,786	874,702	166,880	1,041,582	729,204	166,880	896,084	553,166	162	166,880	176,038	3,279,987
1996	333,070	852,238	147,135	301,341	131,199	1,764,983	909,691	131,955	1,041,646	723,338	131,955	855,293	531,265	161	131,955	192,073	3,472,060
1997	337,122	917,465	154,492	305,861	138,882	1,853,822	1,035,903	222,960	1,258,863	594,959	222,960	817,920	531,135	154	222,960	63,824	3,535,884
1998	370,536	937,597	154,492	310,449	141,435	1,914,509	1,077,339	172,723	1,250,061	664,448	172,723	837,170	544,460	154	172,723	119,988	3,655,872
1999	398,755	1,019,481	154,492	315,106	146,235	2,034,068	1,120,432	200,932	1,321,364	712,704	200,932	913,635	550,150	166	200,932	162,554	3,818,425
2000	325,046	936,429	154,492	319,832	152,737	1,888,535	1,165,249	154,369	1,319,618	568,917	154,369	723,286	313,338	231	154,369	255,579	4,074,005
2001	329,781	1,040,803	154,492	324,630	162,960	2,012,665	1,343,727	260,544	1,604,271	408,395	260,544	668,938	332,275	201	260,544	76,120	4,150,125
2002	402,146	1,083,361	162,216	329,499	166,005	2,143,227	1,397,476	249,765	1,647,242	495,985	249,765	745,751	327,650	228	249,765	168,335	4,318,460
2003	355,529	1,111,234	162,216	334,442	172,738	2,136,159	1,453,375	173,644	1,627,019	509,139	173,644	682,783	332,638	205	173,644	176,502	4,494,961
2004	369,171	1,139,992	162,216	339,458	179,798	2,190,636	1,511,510	180,590	1,692,100	498,536	180,590	679,126	341,475	199	180,590	157,061	4,652,023
2005	616,037	1,158,954	162,216	344,550	186,081	2,467,839	1,571,971	476,445	2,048,416	419,423	476,445	895,868	343,788	261	476,445	75,635	4,727,658
2006	452,210	1,200,296	162,216	349,718	189,106	2,353,547	1,634,850	270,326	1,905,175	448,372	270,326	718,698	349,963	205	270,326	98,409	4,826,067
2007	581,174	1,231,909	170,327	354,964	193,043	2,531,418	1,700,243	435,639	2,135,882	395,535	435,639	831,174	354,613	234	435,639	40,923	4,866,990
2008	429,360	1,264,544	170,327	360,289	194,680	2,419,200	1,768,253	211,265	1,979,518	439,682	211,265	650,947	362,738	179	211,265	76,945	4,943,934
2009	603,574	1,298,238	170,327	365,693	197,757	2,635,590	1,838,983	438,215	2,277,198	358,391	438,215	796,606	363,950	219	438,215	-5,559	4,938,375
2010	560,552	1,333,029	170,327	371,178	197,535	2,632,621	1,912,543	470,774	2,383,317	249,305	470,774	720,078	368,638	195	470,774	-119,333	4,819,042
2011	549,598	1,368,957	170,327	376,746	192,762	2,658,390	1,989,044	332,644	2,321,688	336,701	332,644	669,345	381,438	175	332,644	-44,736	4,774,306
2012	697,722	1,406,065	178,844	382,397	190,972	2,856,001	2,068,606	521,650	2,590,256	265,745	521,650	787,395	381,563	206	521,650	-115,818	4,658,489
2013	690,020	1,444,396	178,844	388,133	186,340	2,887,732	2,151,350	494,036	2,645,386	242,346	494,036	736,382	75,250	979	494,036	167,096	4,825,585

Note: 1994 Capital Improvement Includes $644,399 Payment from Reserve Fund for Terminal Building Addition
Note: 1997 Capital Improvement Includes $ 85,727 Payment from Reserve Fund for Terminal Building Addition
Note: 2001 Capital Improvement Includes $100,000 Payment from Reserve Fund for Terminal Building Addition
Revised: 3/03/93

APPENDIX - CHAPTER 6

The square footage used to determine the Airline Financial Responsibility is shown on the following page.

The appendix also contains excerpts from AC 150/5360-13 concerning AIP Participation in the costs of Terminal Development and excerpts from the PFC Handbook concerning "Gates and Related Areas for Movement of Passengers and Luggage".

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November 6, 1992

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GALLATIN FIELD AIRPORT TERMINAL
(Square Feet - Existing and Proposed)

		FY 1992 Sq. Feet	FY 1994 Sq. Feet	FY 1998 Sq. Feet	FY 2001 Sq. Feet
I.	Revenue Areas				
	A. Airline Exclusive Use				
	1st Floor Ticket/Offices	2,523	3,974	3,974	3,974
	1st Floor Outbound Baggage	3,094	5,501	5,501	5,501
	2nd Floor Offices	312	0	0	0
	Airline Common Use (Excludes First Floor Center Pier)				
	Secured Hold Room	4,494	4,806	4,806	14,811
	Airline Dock	426	815	815	815
	Bag Claim Lobby	1,128	1,128	4,724	4,724
	Bag Claim Drive	1,159	1,159	8,679	8,679
	Sub-Total Airline Exclusive and Common Use	13,136	17,383	28,499	38,504
	B. Concession and Other				
	Gift Shop	404	404	871	871
	Game Room/Concessions	164	0	195	195
	Car Rental/Grnd Transport	872	872	2,759	2,759
	Bar/Restaurant	1,722	4,934	4,934	4,934
	Administration	614	2,205	2,205	2,205
	Sub-Total Concession and Other	3,776	8,415	10,964	10,964
	TOTAL - Revenue Area	16,912	25,798	39,463	49,468
II.	Public Areas				
	1st Floor Lobby/General Circulation	7,137	12,523	12,523	12,895
	2nd Floor Lobby/General Circulation	3,844	4,547	4,547	9,353
	1st Floor Public Toilets	589	959	1,166	1,166
	2nd Floor Public Toilets	289	650	650	2,939
	Public Mtg Room/Unassigned	0	2,425	2,425	2,425
	Sub-Total Public Areas	11,859	21,104	21,311	28,778
	TOTAL REVENUE AND PUBLIC AREAS	28,771	46,902	60,774	78,246
III.	Other Areas				
	1st & 2nd Flr Bldg Services/Mech	494	669	669	1,967
	Basement Mechanical/Other	9,725	9,725	9,725	9,725
	First Floor Center Pier	0	0	0	8,194
	Sub-Total Other Areas	10,219	10,394	10,394	19,886
	TOTAL BUILDING AREA	38,990	57,296	71,168	98,132
IV.	Computation of Airline's Finacial Responsibility				
	Airline Exclusive & Common Use	13,136	17,383	28,499	38,504
	25% of Public Area	2,965	5,276	5,328	7,195
	Total Airline Responsibility sq ft	16,101	22,659	33,827	45,699
	Divided by				
	Total Revenue & Public Area sq ft	28,771	46,902	60,774	78,246
	Percent Airline Responsibility	55.96%	48.31%	55.66%	58.40%

CHAPTER 10. FEDERAL PARTICIPATION IN THE COSTS OF TERMINAL DEVELOPMENT

161. GENERAL. This chapter contains information pertaining to Federal participation in the costs of airport terminal development under the terms of the Airport and Airway Improvement Act of 1982 (P.L. 97-248), as amended by the Airport Airway Safety and Capacity Expansion Act of 1987 (P.L. 100-223).

162. BACKGROUND. The 1982 Act (P.L. 97-248), successor to the Airport and Airway Development Act of 1970, continued financial support for necessary improvements to the Nation's airport and airway system. The Act's Airport Improvement Program (AIP) provides Federal funds through airport grants to finance improvements to eligible public-use airports in the United States. Section 513 of the this Act authorizes funds for airport terminal development and establishes requirements and limitations for funding these facilities.

163. PROJECT ELIGIBILITY.

a. Project costs for terminal development (including multi-modal terminals) in nonrevenue producing public use areas at commercial service airports are eligible for reimbursement. The costs must, however, directly relate to the movement of passengers and baggage within the boundaries of the airport. Eligibility extends to the cost of vehicles used for the movement of passengers between terminal facilities or between terminals and aircraft. Commercial service airports are defined as public airports enplaning annually 2,500 or more passengers and serving scheduled passenger service aircraft.

b. In addition to those projects not meeting eligibility criteria specified previously, the following projects are specifically prohibited by the legislation for reimbursement with Federal funds:

(1) The cost of construction of that part of an airport development project intended for use as a public parking facility for passenger automobiles; and

(2) The cost of construction, alteration, or repair of a hangar or of any part of an airport building not intended to house facilities or activities directly related to the safety of persons at the airport.

164. NONREVENUE PRODUCING PUBLIC-USE AREAS. For purposes of planning, estimating, and programming of terminal development eligible for Federal financial assistance, the following guidance should be used in defining nonrevenue producing public areas:

a. Nonrevenue producing public-use areas are areas which are directly related to the movement of passengers and baggage in air commerce within the boundaries of the airport. Baggage claim areas/equipment, boarding area/corridor, dedicated passenger vehicles for inter terminal/aircraft movement, central waiting rooms, rest rooms, holding areas, and foyers/entryways are examples. Excluded are those areas which are primarily revenue producing, such as restaurants, concession stands, and airline ticketing areas. With regard to baggage areas, only public-use areas associated with baggage claim delivery and automated baggage handling equipment are eligible. Public-use areas and facilities which are leased and receive revenue to defray building amortization, maintenance, and operation costs nevertheless remain public and eligible. Also, limiting the use of areas for reasons of security or processing international passengers does not affect their eligibility.

b. Incidental use of public space for display or advertising, vending machines for public convenience, or coin-operated locks for restrooms does not render areas ineligible. However, costs associated with building adaptation to accommodate these items are not eligible. Further, areas provided to produce income by serving the public with cleaning and laundry areas, game rooms, etc., are not eligible.

c. Eligible vehicles may be specially designed and used for moving passengers between public-use areas within or between terminal facilities or aircraft. Although monies are recovered to defray the costs of amortization, maintenance, and operations, such vehicles remain eligible.

165. FEDERAL SHARE. The Federal share for eligible project costs is limited to 75 percent.

166. PROGRAMMING LIMITATIONS. The following programming limitations are imposed on terminal development by the legislation:

a. All or any portion of the sums apportioned to individual airports under the passenger enplanement formula for any fiscal year may be obligated for terminal development.

b. Not more than $200,000 of discretionary funds may be programmed during any fiscal year for terminal development at a commercial service airport which is not a primary airport. A primary airport is defined as a commercial service airport enplaning 10,000 or more passengers annually.

167. SPECIAL REQUIREMENTS.

a. All safety and security equipment required by rule or regulation is required to be acquired prior to approval of an AIP project for terminal development.

b. Provision of access to the terminal building for passengers enplaning or deplaning from aircraft other than air carrier is required (see paragraph 131).

c. New and existing terminal buildings and facilities are required to be made accessible to the physically handicapped (see Chapter 7).

168. PRORATION OF TERMINAL BUILDING DEVELOPMENT COSTS. In the computation of the Federal share for participation, a determination of eligible/ineligible areas is made by FAA personnel. Engineering judgment, made on the basis of a reasonable and common-sense review of the areas and facilities is relied upon. The procedures used in making this determination should be discussed with the FAA, since there are several acceptable methods for prorating terminal development costs.

169. BOND RETIREMENT. Funds apportioned under the entitlement formulas may be used for retiring the principal of bonds or other indebtedness for eligible terminal development providing:

a. The airport met the definition of an air carrier airport under the previous Airport and Airway Improvement Act;

b. The terminal development was carried out on or after July 1, 1970, and before July 12, 1976;

c. The airport sponsor certifies that the airport has all the safety and security equipment required (see paragraph 131);

d. The Secretary of Transportation determines that no project for airport development outside the terminal area will be deferred if such sums are used for bond retirement; and

e. It is agreed that no funds available for airport development will be obligated for any additional terminal development at such airport for a period of 3 years beginning on the date any such sums are used for bond retirement.

170. APPLICATION OF FEDERAL GUIDANCE. Each terminal is a unique facility designed to meet the individual requirements and desires of the particular community in which it is located. The final design will reflect various demands, constraints, and compromises, as well as physical and financial limitations. Consequently, it is both impractical and undesirable to impose rigid Federal standards for determining space and facility requirements for terminal facilities as a condition for receiving Federal funds. It is neither the intent or desire of the Federal Government to utilize a "cookbook" approach in the design of airport terminals or to impose a particular architectural style. Accordingly, except for the requirements established by legislation or regulation (see paragraph 167), the material contained in this advisory circular is presented as general guidance to assist airport sponsors and their consultants in the planning and design of airport terminals. It is not intended for use in establishing minimum or maximum limits for determining Federal participation. The final review and approval of Federal funds for terminal development will consider whether the design is reasonable, functional, and not overly extravagant or wasteful.

171. - 180. RESERVED.

approve it for PFC funding. Specific justification, according to FAA guidance, has in the past included factors such as unusually low ambient noise levels against which a 65 Ldn contour represents a substantial increase; inclusion of particular terrain features; and noise mitigation for facilities outside the 65 Ldn that have operating hours disproportionally within the daily noise "peaks" (such as schools).

C. *Gates and Related Areas for Movement of Passengers and Luggage*

The final category of projects that can be funded with PFCs is construction of passenger-use areas. Projects eligible under this category are those that facilitate the movement of passengers and baggage in air commerce at the airport. The preamble to the final rule states that the provision did not change in any material way from the NPRM, which had listed the following projects as explicitly eligible: loading gates, baggage handling and make-up areas, ticketing areas, security devices, holding areas, waiting rooms, and associated corridors. Despite efforts by some small airports commenting on the NPRM to convince FAA that concession areas and rental car facilities are necessary components of the overall air transportation system, the regulations explicitly prohibit PFC funding of areas that will be used for concessions. PFC funds cannot be used for improvements related to concession facilities such as rental car facilities, restaurants, and shops.[5]

FAA will publish a list of projects approved and disapproved each month. Study these lists to get a sense of the projects that are acceptable.

D. *Additional Considerations*

A few additional points should be highlighted regarding project eligibility. First, the PFC regulations explicitly state that bond financing costs can be funded with PFC revenues. Bond financing costs include costs associated with issuance, underwriting discount, original issue discount, capitalized interest, debt service reserve funds, initial credit enhancement costs, and initial trustee and paying agent fees.

[5] See Appendix 9, PFC Regulations at § 158.15(b)(6).

surveying, or appraisal for a significant portion of the property to be acquired.

Issuing carrier means any air carrier or foreign air carrier that issues an air travel ticket or whose imprinted ticket stock is used in issuing such ticket by an agent.

One-way trip means any trip that is not a round trip.

Passenger enplaned means a domestic, territorial or international revenue passenger enplaned in the States in scheduled or nonscheduled service on aircraft in intrastate, interstate, or foreign commerce.

PFC means a passenger facility charge covered by this part imposed by a public agency on passengers enplaned at a commercial service airport it controls.

Project means airport planning, airport land acquisition or development of a single project, a multi-phased development program, (including but not limited to development described in an airport capital plan) or a new airport for which PFC financing is sought or approved under this part.

Public agency means a State or any agency of one or more States; a municipality or other political subdivision of a State; an authority created by Federal, State or local law; a tax-supported organization; or an Indian tribe or pueblo that controls a commercial service airport.

Round trip means a trip on a complete air travel itinerary which terminates at the origin point.

State means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, and Guam.

Unliquidated PFC revenue means revenue received by a public agency from collecting carriers but not yet used on approved projects.

§ 158.5 Authority to impose PFC's.

Subject to the provisions of this part, the Administrator may grant authority to a public agency that controls a commercial service airport to impose a PFC of $1.00, $2.00, or $3.00 on passengers enplaned at such an airport. No public agency may impose a PFC under this part unless authorized by the Administrator. No State or political subdivision or agency thereof that is not a public agency may impose a PFC covered by this part.

§ 158.7 Exclusivity of authority.

(a) No State or political subdivision or agency thereof may impair the imposition of a PFC, collection of such PFC, or use of PFC revenue by a public agency in accordance with this part.

(b) No contract or agreement between an air carrier or foreign air carrier and a public agency may impair the authority of such public agency to impose a PFC or use the PFC revenue in accordance with this part.

§ 158.9 Limitations.

(a) No public agency may impose a PFC on any passenger on any flight to an eligible point on an air carrier that receives essential air service compensation on that route under section 419 of the Federal Aviation Act (49 U.S.C. app. 1389). The Administrator makes available a list of carriers and eligible routes determined by the Department of Transportation for which PFC's may not be imposed under this section.

(b) No public agency may require a foreign airline that does not serve a point or points in the U.S. to collect a PFC from a passenger.

§ 158.11 Public agency request not to require collection of PFC's by a class of air carriers or foreign air carriers.

Subject to the requirements of this part, a public agency may request under § 158.25 or § 158.37 that collection of PFC's by any class of air carriers or foreign air carriers not be required if the number of passengers enplaned by the carriers in the class constitutes no more than one percent of the total number of passengers enplaned annually at the airport at which the PFC is imposed.

§ 158.13 Use of PFC revenue.

PFC revenue, including any interest earned after such revenue has been remitted to a public agency, may be used only to finance the allowable costs of approved projects at any airport the public agency controls.

(a) *Total cost.* PFC revenue may be used to pay all or part of the allowable cost of an approved project.

(b) *Bond-associated debt service and financing costs.* (1) PFC revenue may be used to pay debt service and financing costs incurred on that portion of a bond issued to carry out approved projects.

(2) If bond documents require that PFC revenue be commingled in the general revenue stream of the airport controlled by the public agency and pledged generally for the benefit of holders of obligations issued thereunder, PFC revenue is deemed to have been used to pay the costs covered in § 158.13 (b)(1) if—

(i) An amount equal to that portion of the proceeds of the bond issued to carry out approved projects is used to pay allowable costs of such projects; and

(ii) To the extent that the amount of PFC revenue collected in any year exceeds the amount of debt service and financing costs on such bonds during that year, an amount equal to the excess is applied as required by § 158.39.

(c) *Combination of PFC revenue and Federal grant funds.* A public agency may use a combination of PFC revenue and airport grant funds to accomplish an approved project. Such projects shall be subject to the recordkeeping and auditing requirements set forth in subpart D of this part, in addition to the reporting, recordkeeping and auditing requirements imposed pursuant to the Airport and Airway Improvement Act of 1982 (AAIA).

(d) *Non-Federal share.* PFC revenue may be used to meet the non-Federal share of the cost of projects funded under the Federal airport grant program.

(e) *Approval of project following approval to impose a PFC.* The public agency shall not use PFC revenue or interest earned thereon except on an approved project.

§ 158.15 Project eligibility.

(a) To be eligible, a project must—

(1) Preserve or enhance safety, security, or capacity of the national air transportation system;

(2) Reduce noise or mitigate noise impacts resulting from an airport; or

(3) Furnish opportunities for enhanced competition between or among air carriers.

(b) Eligible projects are—

(1) Airport development eligible under the AAIA;

(2) Airport planning eligible under the AAIA;

(3) Terminal development as described in 49 U.S.C. App. 2212(b);

(4) Airport noise compatibility planning as described in 49 U.S.C. App. 2103(b);

(5) Noise compatibility measures eligible for Federal assistance under 49 U.S.C. App. 2104(c), without regard to whether the measures have been approved pursuant to 14 CFR part 150; or

(6) Construction of gates and related areas at which passengers are enplaned or deplaned and other areas directly related to the movement of passengers and baggage in air commerce within the boundaries of the airport. These areas do not include restaurants, car rental facilities, automobile parking facilities, or other concessions.

GALLATIN FILED AIRPORT
MASTER PLAN UPDATE/TERMINAL FEASIBILITY STUDY
CHAPTER 7 - ENVIRONMENTAL OVERVIEW

I. ENVIRONMENTAL OVERVIEW

The Environmental Overview section of this study addresses the social, economic,and environmental effects of the development recommendations made in conjunction with the Gallatin Field Airport Master Plan Update/Terminal Feasibility Study. This study addresses the developments required at Gallatin Field to safely and efficiently meet aviation demands over the twenty year planning period. The recommended developments are presented in Chapter 4 - Facility Requirements, and Chapter 5 - Terminal Area Facility Requirements. Chapter 4 discusses physical requirements such as runway length and strength, taxiways, aprons, land, equipment, buildings, and support facilities necessary to meet the aviation needs of the community throughout the planning period. Chapter 5 discusses the physical requirements of the terminal building necessary to accommodate current and future needs of air carrier passengers, airlines, and terminal tenants.

Specific airport development recommendations at Gallatin Field Airport which require environmental analysis are described in the following sections.

II PURPOSE AND NEED

The purpose of this environmental overview is to present the recommended developments for Gallatin Field Airport and systematically describe the potential environmental impacts of those developments.

The need for improvements at the airport was identified and justified in previous chapters of this study. The fact that forecasts indicate increasing enplanments and operations at the airport over the next twenty years confirms the need to maintain and improve airport facilities. Recommended developments presented in Chapter 4, Table 4-13, are repeated in Table 7-1 for ease of reference.

TABLE 7-1
AIRPORT CAPITAL IMPROVEMENT PROGRAM
(1993-2012)
ASSUMES 1992 CONSTRUCTION COSTS PLUS 4% INFLATION

PHASE I 1993-1997		**COST**
1. Runway 3-21 Environmental Assessment		$ 30,000.00
2. Phase I Terminal Expansion	*	$5,022,000.00
3. Runway 3-21 Land Acquisition	*	$ 400,000.00
4. Phase II Terminal Expansion		$3,129,000.00
SUBTOTAL PHASE I		$8,581,000.00

PHASE II 1998-2002		**COST**
1. Replace Snow Plows #5 and #6		$ 300,000.00
2. Runway 3-21 Construction		$ 525,000.00
3. Front End Loader/Ramp Plow		$ 210,000.00
4. Phase III Terminal Expansion	*	$3,464,000.00
5. Terminal Apron Expansion (Asphalt)		$ 370,000.00
6. Fire Station Expansion		$ 593,000.00
7. Front End Loader		$ 235,000.00
SUBTOTAL PHASE II		$5,697,000.00

PHASE III 2003-2012	**COST**
1. Terminal Apron Expansion	$3,225,000.00
2. Expand Maintenance Building	$ 750,000.00
3. Access Road and Storm Drainage Improvements	$2,325,000.00
4. Overlay Taxiway System	$2,185,000.00
5. Overlay Runway 12-30	$1,350,000.00
6. Develop Runway 3-21 to BII Standards	$ 950,000.00
7. Extend Runway 12-30 to 10,500	$2,745,000.00
8. Extend Parallel Taxiway	$2,370,000.00
SUBTOTAL PHASE III	$15,900,000.00
TOTAL ESTIMATED COSTS OF PROJECT	**$30,178,000.00**

* Note:

Phase I Terminal expansion includes $100,000 for PFC application and bonding costs.

Runway 3-21 land acquisition requires AIP Discretionary Funds.

Phase III Terminal expansion includes $35,000 for bonding costs.

The recent completion of a taxiway guidance sign program, revision of existing signs, and installation of new signs means Gallatin Field is in total compliance with Advisory Circular 5340-18C. In 1992, construction of acceleration/deceleration lanes and improved Road Signing on Old U.S. 10 enhanced the safety of individuals driving to and from Gallatin Field. Safety areas between T/W A & E were also improved by the filling of the ditch that lies between them. Part 107, Security, was improved by the installation of a new security gate near the terminal and by the upgrading of several existing gates.

By completing the above improvements, Gallatin Field is in full compliance with all FAR Part 139 Airport Certification requirements and all mandatory requirements relating to Security and Safety. This permits Gallatin Field to proceed with needed improvements in the Terminal Area and to start planning improvements to bring the crosswind Runway 3-21 up to current FAA standards.

The Terminal Feasibility portion of this study recommends expanding the existing terminal building in three construction phases to maximize the utilization of Airport Improvement Program (A.I.P.) funds. The expansion of the terminal building is required to resolve the existing building deficiencies discussed below and to provide facilities for the forecast increased passenger enplanements.

The FAA's implementation of security screening of all passengers has caused significant congestion in the second floor lobby of the terminal building at Gallatin Field during peak periods. The expansion of the security screening and queuing area in the terminal is required to provide adequate space for meeters and greeters, as well as the passengers boarding their flights. Another area of congestion during peak periods is in the existing ticketing lobby. The proposed improvements include moving the ticket counters and expanding the building on both ends to provide more space. The existing restaurant, lounge and kitchen are too small to accommodate the existing demand. The need for additional space for rental car concessions and for a recirculating claim conveyor or claim device are also addressed in the Terminal Feasibility Section of the Master Plan.

Runway 3-21 is a crosswind runway serving small aircraft at Gallatin Field. The length of this runway is only 3,412 feet and it serves only 75% of the General Aviation Fleet. The existing threshold of Runway 3 needs to be relocated to the north to provide adequate runway sight distance. In addition, Runway 3-21 requires an extension to accommodate 95% of the General Aviation Fleet. The northerly expansion of this runway requires purchasing additional land and relocation of three residents, as well as the relocation of a county road. Relocation of the residents and the county road will be required even if the runway is not extended for 95% of the General Aviation Fleet due to need to relocate the

Runway 3 Threshold and maintain the current 3,400 ft. runway length.

Additional recommended development items include the acquisition of, or the replacement of snow removal equipment, and Aircraft Rescue and Firefighting (ARFF) equipment, the development of a Storm Water Drainage program for the terminal and apron areas, a program for maintenance to the asphalt surfaces and modifications to enhance the existing Flight Service Station facility.

Late in the study period, the extension of Runway 12-30 from 9,000 ft. to 10,500 ft. is anticipated. Currently, airlines operate with a take off weight penalty during summer months for some route segments. Extension of the runway will permit aircraft to be utilized to their full capacity, and also permit carriers to fly longer segments.

All of the above development items are necessary to efficiently and safely meet aviation demands and the needs of airport users throughout the planning period.

III. AFFECTED ENVIRONMENT

GALLATIN FIELD AIRPORT is located West of Bozeman, Montana, East of Belgrade, Montana, at latitude 45° 46' 47" North and Longitude 111° 09' 22" West. The airport is bordered by the City of Belgrade to the West, Baseline Road to the North, Airport Road to the East, and Old Highway 10 to the South. Present and future population and general economic status of the area served by the airport were evaluated in Chapter 2.

A list of potential impacts for each of the recommended developments is provided on the following matrix (Table 7-2). The airport is surrounded mostly by farmland or other compatible land uses, with the exception of a small area to the North. The recommended developments with the exception of the Runway 3-21 extension are confined to existing airport property. therefore, no significant impact is anticipated by any of the proposed projects.

The FAA will require a complete Environment Assessment (EA) prior to approving the construction of an extension of Runway 3-21 and Runway 12-30. The EA will discuss alternatives, including the "do nothing alternative", in the case of Runway 3-21, as well as, other alignment alternatives.

The Master Plan Update included the development of new wind roses with one and one half years available wind data. The data available was not over a long enough period to substantiate a change in the current wind roses.

As part of the EA for Runway 3-21, additional wind data should be summarized. This wind data is necessary for reviewing other alignment alternatives.

The "do nothing alternative" is unacceptable due to Runway 3-21 not meeting new FAA runway line of sight criteria. Other runway alignments do not provide comparable wind coverage based on the current wind rose, and adversely affect future airport land uses and adjacent environment.

The most viable alternative alignment for Runway 3-21 is a 16-34 North South runway alignment. This alignment can be constructed on existing airport property. Depending on final location of this alternative, Avigation Easements may be required from the National Guard and other adjacent land owners. The FAA's FSO facilities may need to be relocated if a Runway 16-34 alignment is selected during the EA process, rather than extending Runway 3-21.

A Runway 16-34 alignment, however, does not meet Gallatin Field needs. A paved Runway 16-34 was abandoned in the 50's in favor of the construction and maintenance of a turf Runway 3-21. In the 1971 Master Plan, when the new terminal site required abandonment of the old turf Runway 3-21, a new turf runway on the same alignment was constructed to meet general aviation needs.

The Runway 3-21 expansion requires purchase of 90 acres of additional land, relocation of three families (two trailer houses and one house) and relocation of 6,700 ft. of county road.

TABLE 7-2
POTENTIAL ENVIRONMENTAL IMPACT

ENVIRONMENTAL CONCERNS	POTENTIAL IMPACT OF RECOMMENDED DEVELOPMENTS
Noise	L
Compatible Land Use	M
Social Impact	M
Air Quality	L
WATER Quality	L
Dept. of Trans. Sec. 4F Lands	NA
Historical, Architectural, Archaeological, and Cultural Resources	L
Biotic Communities	L
Endangered and Threatened Species of Flora and Fauna	NA
Wetlands	L
Floodplains	L
Coastal Zone Management Program	NA
Coastal Barriers	NA
Wild Scenic Rivers	NA
Farmlands	L
Energy Supply and Natural Resources	L
Light Emissions	L
Solid Waste Impact	L
Construction Impact	L

Potential Impact

S = SIGNIFICANT IMPACT
M - MODERATE IMPACT
L = LOW IMPACT
NA = NOT APPLICABLE

IV. ENVIRONMENTAL CONSEQUENCES

IV(a) NOISE

Aircraft sound emissions are often the most noticeable environmental effect an airport will produce. If the sound is sufficiently loud or frequent in occurrence it may interfere with daily activities and be considered objectionable. The impact of aircraft noise depends on the uses of the land in the vicinity of the airport, the number of aircraft operations, and characteristics of the aircraft using the airport.

The Gallatin Airport Authority has completed airport-land use compatibility studies and implemented these studies in order to achieve and maintain the compatibility of Gallatin Field with its environs. Inherent in implementation of the plan is the assurance that the airport can maintain or expand its size and level of operations to satisfy existing and future aviation demands and that persons who live, work, or own property near the airport may enjoy a maximum amount of freedom from noise or other adverse impacts of the airport.

The uses of the land surrounding an airport exhibit different compatibilities with the Airport. Land used for schools, residences, churches, health care facilities, libraries, and theaters are generally non-compatible land uses due to persons living or working in the facilities being sensitive to noise. Factories, warehouses, storage yards, and open farmland are generally compatible as persons using the facilities are not sensitive to airport noise. Some land uses such as offices, shopping centers, recreation areas, or hotels, have intermediate levels of compatibility due to construction mitegating the noise exposure of uses.

The first step in determining noise related impacts on the environment surrounding Gallatin Field Airport requires analysis of noise exposure patterns. Noise contours, which indicate areas that may be impacted by aircraft noise during the planning period, were developed in an Airport Noise - Land use Study completed for Gallatin Field in 1979.

The 1979 Noise Study was reviewed and the projections contained in this study are still applicable. As discussed in the Noise Interpretation Section, forecast operations for the 1979 study period are comparable with the operations for the study period in this Master Plan update. For this reason, new noise contours were not required to be developed as a part of the scope of work of this update.

Noise Contour Development

The noise contours for this study were developed through the FAA's process called the Version 1 Model of the Integrated Noise

Model (INM). The noise that the 1979 Gallatin Field study concerned itself with were identified as Zones C and D. These two zones, or districts, are the areas where significant exposure and severe exposure to noise have resulted in the Housing and Urban Development (HUD) classification of Zone C being "normally unacceptable" for residences because the decibel range is between 65 and 75. The classification of "clearly unacceptable" is placed on Zone D, which is 75 decibels and higher. The classification of the two districts pertain to residences being located in those areas. Many other acceptable land uses can be conducted in District C, but District D should contain nothing but aviation related facilities due to the severity of noise levels.

The noise contours were developed based on the forecasted traffic for the period of 1979 to 1997. The aircraft traffic is quantified by the runway approach and departure usage and flight path. The size of airplane, its weight and its stage length are also programmed and built into the computer model. The projected numbers of aircraft are actually computer "flown" or simulated for the twenty year period and the resultant noise contours are plotted by computer on the map of the airport vicinity. The noise contour lines are annual averages and not based on actual readings. The actual readings would vary from day to day dependent upon the variables for that day. For example, there could be occasions when decibel readings as high as 100 could be recorded for a few seconds at a given location near the airport and on the following day when the bad weather precludes flights there would be no exposure to aircraft noise.

Noise contours are used in land use planning as guidance tools and a considerable amount of professional judgment, logic, and interpretation is used in plotting the contours and recommending resultant land uses. It must be remembered that the contours do not represent distinct boundaries between perceived noise levels. Residents on one side of the contour line will not be able to take a few steps to the "other side" of the line and experience a new noise level. Nevertheless, the line is drawn in the most practical and technically accurate location taking into consideration existing land uses and geographic features, such as roads, streams and man-made barriers.

The primary objective of the 1979 plan was to provide a tool to prevent noncompatible land use encroachments within the airport influence area. The plan is used as a preventative, as well as a corrective planning tool. Based on the Plan, the Gallatin Airport Authority completed several extensive land acquisition and property owner relocation projects. Through these projects, the Airport Authority either purchased the land within the LDN 75 Noise Contour or purchased the development rights through easement. The majority of land within the LDN 65, normally unacceptable, for any type of development, was also acquired by the same means listed above. These projects are complete at the time of the preparation of the 1993 Master Plan Update.

NOISE INTERPRETATION

Noise of all types influences human behavior and activities in many different ways. In particular, the impact of aircraft noise may affect people both physically and psychologically. Detailed quantification of these impacts is extremely difficult due to different individual reactions to noise. The Environmental Protection Agency (EPA) has sponsored and conducted a number of studies with the goal of determining the impact of aircraft noise on the human environment.

With regard to structural damage to buildings, airborne sound normally encountered does not usually carry sufficient energy to cause damage to most structures. The major exceptions to this are sonic booms produced by supersonic aircraft, low frequency sound produced by rocket engines, and some construction equipment.

Studies done in the mid-1960's have shown that in communities impacted by aircraft noise, interruption of rest, relaxation, and sleep were the underlying causes of most registered complaints. No two individuals perceive noise in exactly the same fashion. Such factors as morale, anxiety, and introversion play a role in determining one's reaction to noise. This, the major detrimental impact of community noise exposure is primarily psychological rather than physical.

Noise contours were developed in the 1979 Airport Noise - Land use Study based on 7,348 commercial jet and turbine operations in 1977 and 29,580 at the end of the planning period in 1997. The 1992 Master Plan Terminal Feasibility Study forecast operations for similar aircarrier, commuter, airtaxi and charter type aircraft in 1990 at 13,888 operations and 26,687 operations at the end of the planning period in 2010. Forecasts completed for Gallatin Field in the 1970's were optimistic and have not been achieved. Because of the similarities of the projected operations, the present noise contours for Gallatin Field should remain intact.

The FAA process for developing contours today is consistent with that used in 1979, Version 1, Integrated Noise Model (INM). Technological advancements made on the jet engine today will continue to produce a much quieter engine in the future.

In general, it is not until noise levels of 65 LDN are experienced that land uses become sensitive to noise. Forecasted contours for the year 2010 would most likely decrease from those estimated in 1979 in spite of increased operations because of technological advances in airplane engines. In conclusion, the increased operations at Gallatin Field will produce no significant impact over noise sensitive areas.

IV(b). COMPATIBLE LAND USE

The land uses around Gallatin Field Airport are generally compatible with airport functions and have been properly zoned to reflect this. Easements or outright purchase of the land for Runway Protection Zones have been obtained beyond airport property. As part of each project application for Airport Improvement Projects undertaken at the airport, the Gallatin Airport Authority has made assurances of land use compatibility as required by Section 19(a)(4) of the Airport and Airway Development Act.

IV(c). SOCIOECONOMIC IMPACTS

The additional land required for airport improvements is presently used for both agriculture and private residences. While the farmland contains no structures, there are three residences that will be impacted when Runway 3-21 is extended.

The actual values of the land and residences will be determined during the land acquisition phase. Appraisals will be performed in accordance with advisory Circular 150/5100-11, Land Acquisition and Relocation Assistance under the AIRPORT Development Aid Program.

IV(d). AIR QUALITY

Federal Aviation Administration Order 5050.4 "Airport Environmental Handbook" states that no air quality analysis is needed if the airport is "a commercial service airport and has less than 1.3 million passengers and less than 180,000 general aviation operations forecast annually" (FAA Order 5050.4A, Chapter 5, page 33). Enplanement and general aviation operations forecast for the twenty year planning period at Gallatin Field Airport do not meet these requirements.

FAA Order 5050.4 further states that unless the "Federal action involves airport location, runway development or other physical airside and/or landside improvements which increase airport capacity,...normally no air quality analysis is required for the environmental assessment; normally it may be assumed that there is no potential for significant air quality impacts." The improvements recommended by this study do not change the airport site. Although operations are forecast to increase, air pollutants shouldn't increase significantly from current levels, which do not indicate significant environmental impact.

IV(e). WATER QUALITY

The airport property is crossed by the Spain-Ferris ditch. This is a seasonal irrigation supply ditch used for the transfer of water to property north of the airport. The airport presents no significant impact on the ditch.

The airport is located on relatively flat land which is generally not subject to erosion due to run-off. The recommended developments will not significantly change the topography of the site, and no increase sediment will be transmitted to stream channels. No significant water quality impacts are foreseen.

IV(f). DEPARTMENT OF TRANSPORTATION SECTION 4 (f) LANDS

There are no Section 4 (f) lands involved with any of the recommended developments as defined in FAA Order 5050.5. All recommended developments are on airport property with the exception of the extension of Runway 3-21.

IV(g). HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

A cultural resource survey was conducted in June, 1992. The survey was limited to lands indicated for use in future expansion projects, and no significant cultural resources were located. Most of the recommended developments throughout the planning period are limited to areas previously disturbed. The survey is contained in an appendix to Chapter 7.

IV(h). BIOTIC COMMUNITIES

The recommended developments will not impact any publicly owned wildlife or waterfowl refuge of local, state or national significance. The improvements will not affect any water resources, and will be limited to existing airport property o r property acquired for the Runway 3-21 extension. Some small rodents, larger mammals, birds, and reptiles may be displaced during construction activities. These animals will return to the area when construction is completed or relocated to other areas, depending on the availability to suitable habitat.

IV(i). ENDANGERED AND THREATENED SPECIES

There are no known endangered or threatened species of flora or fauna on the existing or proposed airport property.

IV(j). WETLANDS

The existing airport property and adjacent lands contain no wetlands that would be affected by the recommended developments. No significant impacts are anticipated.

IV(k). FLOODPLAINS

There are no floodplains existing on Gallatin Field Property. No significant impacts are foreseen for any of the recommended developments.

IV(l). COASTAL ZONE MANAGEMENT PROGRAM

Not Applicable

IV(m). COASTAL BARRIERS

Not Applicable

IV(n) WILD AND SCENIC RIVERS

Not Applicable

IV(o). PRIME AND UNIQUE FARMLAND

The recommended developments are limited to existing airport property and low density residential acreage. No conversion of existing farmland is proposed throughout the study period.

IV(p). ENERGY SUPPLY AND NATURAL RESOURCES

No unusual energy demand or use of natural resources is anticipated due to construction of the recommended developments.

There should be no unusual or significant impacts during the planning period.

IV(q) LIGHT EMISSIONS

All recommended developments except Runway 3-21 extension are limited to airport property and most of the developments will take place in area previously developed. No significant impact is expected.

IV(r). SOLID WASTE

Proposed developments at the airport will not have any direct relationship to solid waste collection, control, or disposal other than that associated with the construction itself. The existing landfill is over five miles for the nearest runway. An existing sewage lagoon exists north of the airport. There is no known expansion at this facility that would increase the activity of water fowl in the vicinity of the airport. No significant impacts are foreseen for any of the recommended developments.

IV(s). CONSTRUCTION IMPACTS

It is anticipated that construction of the recommended developments will be phased over relatively short term periods, and some short term effects could be present.

During the various construction periods, safeguards as outlined in Federal Aviation Advisory 150/3370-7 (Airport Construction Control to Prevent Air and Water Pollution), will be utilized to minimize adverse effects on the environment.

The construction will also be competed in accordance with the current State and County Air and Water pollution control standards. No significant impacts are foreseen for any of the recommended developments.

LIST OF PREPARERS

Scott T. Bell, P.E., Montana #8123 P.E.
B.S. Civil Engineering/1984
M.S. Civil ENgineering/1990

Chief Airport Engineer and Project Manager. Responsible for the Gallatin Field Airport Master Plan Update/Terminal Feasibility Study. Mr. Bell is responsible for airport planning, design and construction management at both general aviation and commercial airports. Mr. Bell has been project manager for airport Master Plans, site investigations, and feasibility studies. His experience includes plan preparation, specifications, quantity and cost estimates, Federal and State grant applications, and contract administration for air carriers, commercial services, and general aviation development projects.

F.E. (Woody) Fogg
Engineering Technician

Mr. Fogg has been involved with commercial air transportation and airport operation for 23.5 years. His experience includes, but is not limited to the following: Managing commercial service airports, contract administration, quantity and cost estimates, State and Federal grant applications, lease negotiations, and project inspection.

AGENCIES

List of Agencies in receipt of the Draft Environmental Overview:

Gallatin Field Airport Authority

Federal Aviation Administration, Helena

Cultural Resource Management Report

GALLATIN AIRPORT AUTHORITY - GALLATIN FIELD AIRPORT

AIP 3-30-0010-12

GALLATIN COUNTY, MONTANA

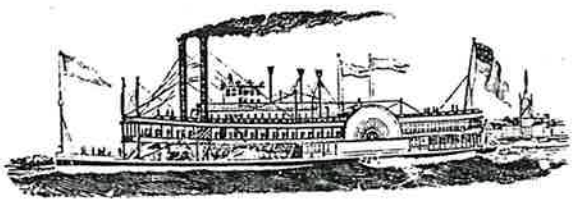
Date: 16 April 1992

For: Gallatin Airport Authority
Gallatin Field
Belgrade, Montana 59714

Inspector: Garvey C. Wood
David E. Highness

Gar C. Wood and Associates

LOMA, MONTANA 59460 Phone 406 739-4224



Archaeological Consultants

CULTURAL RESOURCES INVENTORY
AVIATION TRANSPORTATION

ABSTRACT

On 23 March through 26 March 1992 a cultural resources inventory was completed on the 548 acres of a proposed general aviation airport expansion project. No historic cultural resources were found and no additional investigations are recommended.

PROJECT DESCRIPTION

Project: Gallatin Airport Authority - Gallatin Field Airport
AIP 3-30-0010-12

Location:

AREA A: S 1/2 NW 1/4, SW 1/4, & W 1/2 SE 1/4 of Section 36 of T1N & R4E; and N 1/2 N 1/2 NE 1/4 of Section 1 of T1S and R4E;

AREA B: E 1/2, & E 1/2 NW 1/4 of Section 6, and SW 1/4, & S 1/2 S 1/2 NW 1/4 of Section 5 of T1S & R5E;

AREA C: NW 1/4 of Section 7;

AREA D: E 1/2 E 1/2 of Section 1 of T1S & R4E, SW 1/4 NW 1/4, & SW 1/ of Section 6 of T1S & R5E, and N 1/2 NW 1/4 of Section 7 of T1S & R5E in Gallatin County, Montana; Montana Principal Meridian.

Ownership: surface - Gallatin Airport Authority/private; minerals - same.

Date of Report: 16 April 1992.

Date of proposed operations: As soon as approved.

Potential expansion and development is proposed on Gallatin Field to serve Bozeman, Belgrade, and the other communities of the Gallatin River valley in northern Gallatin County. The airport is continually expanding due to increased demands for service. There was considerable evidence of previous artificial surface disturbance across more than 95% of the proposed area. There were several cultivated fields on the property at one time which have been placed in tame and native grasses.

ENVIRONMENTAL REVIEW.

The general topography is rolling foothills from the edges of timber in the mountains to the plains. The local topography is the wide Gallatin River valley and its tributary rivers and creeks. Soils are sandy and gravelly loams to silt and clay. The shallow topsoil is dark grayish-brown. The Gallatin River valley is about 25 miles wide and at Belgrade is 4474' above mean sea level. The confluence of the Gallatin, Madison, and Jefferson Rivers to form the Missouri River is about 20 miles to the west northwest. The mountains north of Belgrade rise nearly 5,000' above the valley floor. There are scattered stands of trees located at random intervals across the valley floor. The local topography is the grassy floor of the valley. Vegetation on nearby native sod consists of native species typical of the Foothill Grassland vegetation region. The principal forage species include wheatgrasses, fescues, and needle-and-thread. Crested wheatgrass predominates over most of the inspection area. The range conditions were about 25% of normal. Soil surface visibility was about 75%.

FIELD WORK

A file search of the records at the Site Files at the University of Montana in Missoula by the State Historic Preservation Office in Helena revealed 5 sites have been previously recorded on the vicinity of the project (Schwab 1992).

Two of these sites have been recorded in error and their legal description should be changed to reflect their actual location. The R.T. Barnett and Company building (24GA715) is not in Section 7 of T1S & R5E. It may be in Section 7 of T2S & R5E, which is the center of the City of Bozeman. The South Willson Historic District (24GA717) is also not in Section 7 of T1S & R5E. It also may be in Section 7 of T2S & R5E. The discovery of the exact legal locations of these two sites is beyond the scope of this project.

Site 24GA391 is the Thomas Quaw house recorded by Jiusto in 1990 and located in T1S & R4E within the city limits of Belgrade (Jiusto 1990). It was located on the 7.5' Blegrade quad map and that location is reflected on Figure 2.

Site 24GA423 is a prehistoric shallow lithic scatter located by Bailey in 1978 in conjunction with an airport improvement project (Bailey 1978). It is located in the SW 1/4 SE 1/4 SE 1/4 NE 1/4 and NW 1/4 NE 1/4 NE 1/4 SE 1/4 of Section 7 of T1S & R5E. It was located on a sketch map and the site report also included a physical desription of the location. This is reflected on Figure 2.

Site 24GA768 is the Belgrade City Hall and Jail recorded by Heath in 1981 in Section 1 of T1S & R4E (Heath 1981). No map was included in the report. It was located from a street description in the report and this is reflected on Figure 2.

David E. Highess did an intensive cultural resources survey and surface evaluation of the area shown on the enclosed maps beginning on 23 March and continuing through 26 March 1992. The 548 acres of the proposed airport improvement areas were surveyed with multiple pedestrian transects with an average spacing of 100 feet. All areas of the survey received equal attention. Special attention was then given to areas of higher site potential and visibility, such as sandy areas, dunes, coulees, erosional areas, animal holes, benches, and hilltops.

CULTURAL RESOURCES INVENTORY

One potential historic site was discovered (see below) during the inventory. Clearance is recommended.

The Spain Ferris Fork Ditch crosses a portion of AREA D. The ditch is about 6' wide and 3' deep. There are two ditches with this name in the vicinity. The are four different water rights filed on these two ditches dating back to October 1886. The newest water right claim is June of 1890 (Compton 1992). This use date would obviously make the ditch an historical site. However, that portion of the ditch in the project area was placed in its current location less than 20 years ago (Dykstra 1992). The diversion was from the Gallatin river. The ditch that passes through the Gallatin Field is a fork of the main ditch. It was moved to its present location during a very recent airport improvement project (Dykstra 1992). The recordation of the original ditch about a mile east of this ditch is beyond the scope of this project. No subsurface testing was conducted. No evidence of any other features were discovered..

The portion of the ditch which crosses airport property has a low potential to yield further information on local history. It lacks time depth to even be considered a site at this time; dating much less than 45 years old. The original ditch should be recorded if it is ever impacted by construction.

RECOMMENDATIONS

The Spain Ferris Fork Ditch as it was located should not be considered a site and is not recommended as eligible for nomination to the National Register. No further work is recommended for this project.

The cultural resources found within the project area do not appear to be eligible for nomination to the National Register of Historic Places because of severe disturbance. No sacred or religious sites were discovered on the inspection area. The action will have no effect on any previously recorded site. Archaeological clearance is recommended as long as no deviation is made from the project areas as located in March 1992.

If subsurface cultural materials are found during construction the State Historic Preservation Office should be contacted immediately at (406) 444-7715.

These recommendations are subject to the approval of the the State Historic Preservation Office will be carried out after authorization by the Gallatin Airport Authority, Belgrade, Montana 59714.

Garvey C. Wood, Inspector

cc: Scott Bell, MM, Bozeman (2)
Dr. Tom Foor, UM, Missoula (1)
David Schwab, SHPO, Helena (1)

REFERENCES CITED:

Bailey, Marilyn
1978 Site report 24GA423 on file in Archaeology Records, University of Montana, Missoula.

Compton, Scott
1992 Personal communication. Regional Manager, DNRC Field Office, Bozeman.

Dykstra, Norman
1992 Personal communication. Chairman, Spain Ferris Fork Ditch Association, Belgrade.

Heath, Kingston
1981 Site report 24GA768 on file in Archaeology Records, University of Montana, Missoula.

Jiusto, Chere
1990 Site report 24GA391 on file in Archaeology Records, University of Montana, Missoula.

Schwab, David
1992 Cultural resource file search for Gallatin Airport Project, State Historic Preservation Office, Helena.

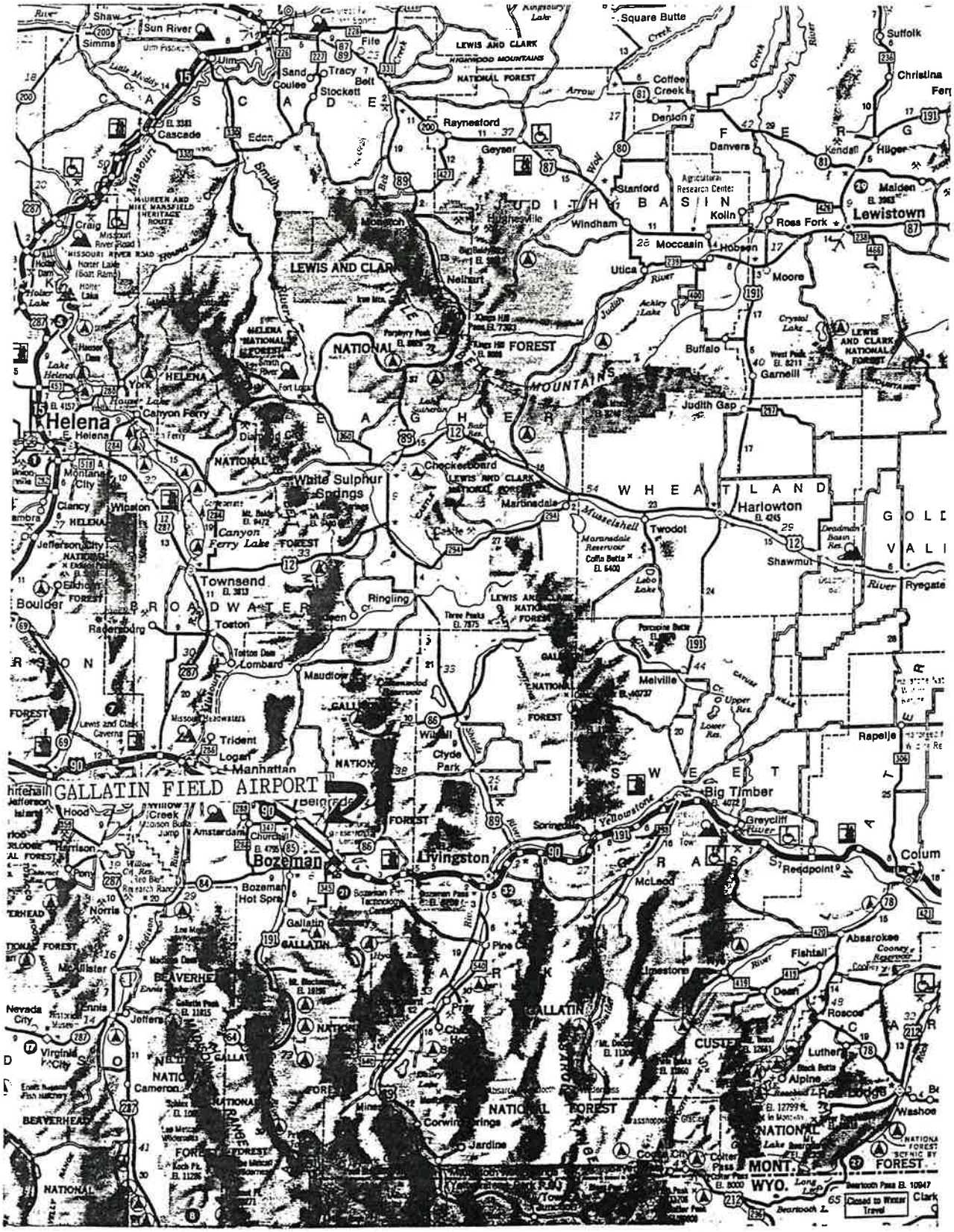


Figure 1: Location of proposed Gallatin Field Airport Project in Gallatin County on Montana Highway Map, 1990. Scale: 1" = 22 miles.

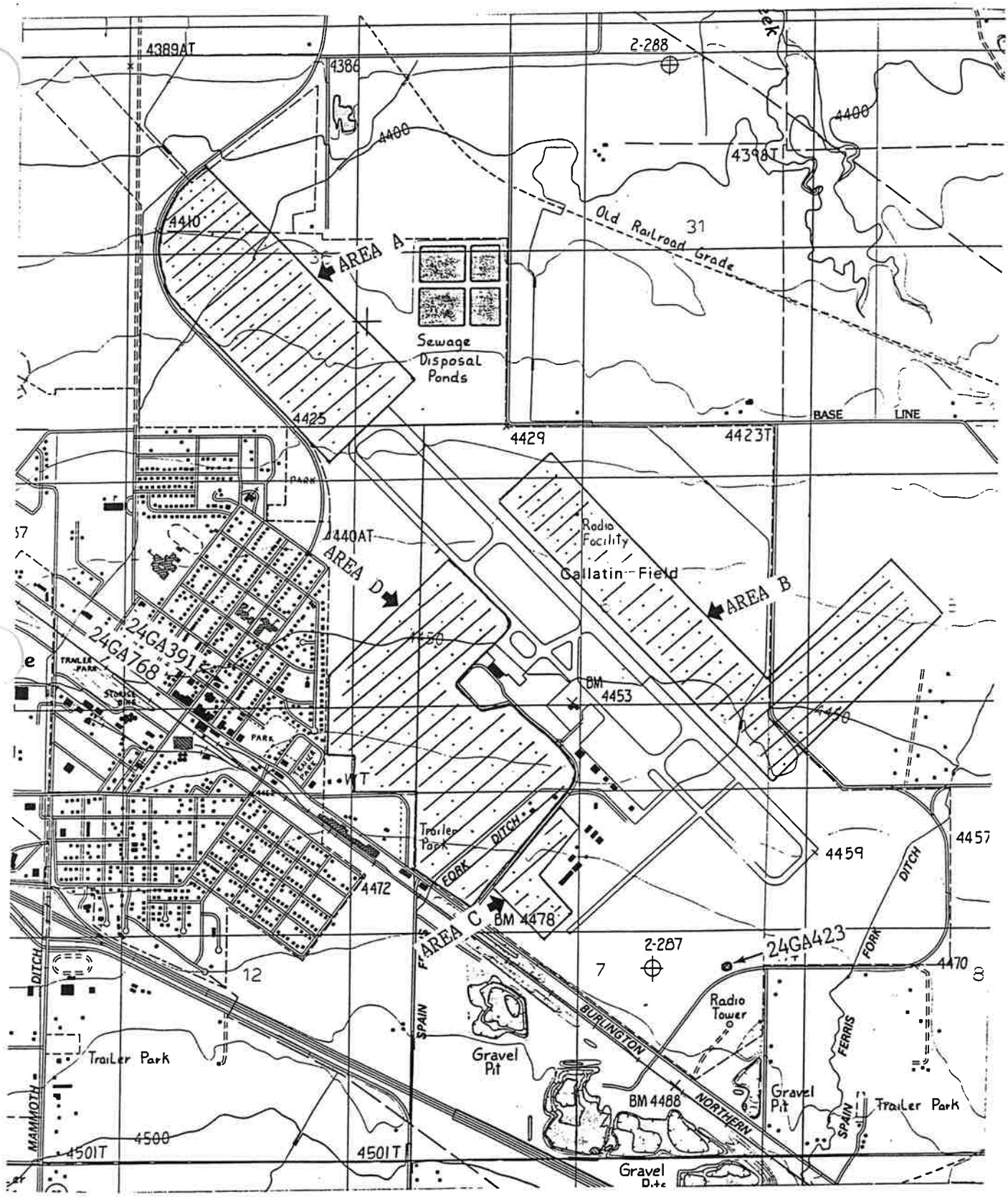


Figure 2: Location of Improvement Areas A, B. C, D, 24GA391, 24GA423, and 24GA768 in Section 36 of T1N & R4E, Section 1 of T1S & R4E, and Sections 5, 6, & 7 of T1S & R5E on USGS 7.5' quad map, Belgrade, Mont., 1987. Scale: 1" = 2,000'. Contour interval 10 feet. Inspection area of March 1992 is marked (////).

Figure 3: Photo of proposed improvement area near Gallatin Field in Gallatin County, Montana.