5.0 LANDSIDE FACILITY REQUIREMENTS

The capacities and capabilities of the Airport's landside facilities, or those functional areas not related to the movement of aircraft, are evaluated in this element of the Master Plan Update. To properly plan for the Airport's future needs, the projections of aviation activity, presented in Chapter 3.0*, Activity Projections*, are translated into specific types and quantities of facilities that can adequately serve projected activity levels. These analyses are intended to identify, in general terms, the deficiencies in existing facilities and outline what new facilities will be required to meet projected growth. Alternatives for providing these facilities will then be identified in the next element of the planning process.

Facility requirements were calculated for the following airport functional areas:

- *Passenger Terminal*
- *Airport Access and Curbfront*
- *Parking (public, rental car, commercial, and employee)*
- *Air Cargo*
- *General Aviation*
- *Support Facilities*

The facility requirements identified represent a level of detail which is common to a master planning effort, not a level of detail that is equivalent to an architectural or engineering design study.

5.1 TERMINAL REQUIREMENTS

This section presents the facility requirements for the passenger terminal at the Airport. The following sections provide the methodology and analysis related to this key part of the Airport:

- *Historical Demand Patterns*
- *Level of Service Standards*

- *Terminal Facility Requirements*

5.1.1 Historical Demand Patterns

5.1.1.1 Annual Passenger Activity

As shown on **Exhibit 5.1-1** annual enplaned passenger activity at General Mitchell International Airport (GMIA) has increased from approximately 2.0 Million Annual Enplaned Passengers (MAEP) in 1991 to approximately 3.0 MAEP in the year 2000. Passenger demand following the September 11, 2001 terrorist attacks was reduced to 2.8 MAEP in the year 2001. Overall growth between 1991 and 2001 resulted in an average annual increase of approximately 3.3 percent. Facilities requirements are usually based on recurring busy periods of demand, such as peak-hour passengers on an average day in the peak month (ADPM). However, airport revenue is in many ways tied to annual passenger and aircraft operational levels. Therefore, estimated growth in annual passengers and aircraft operations is both:

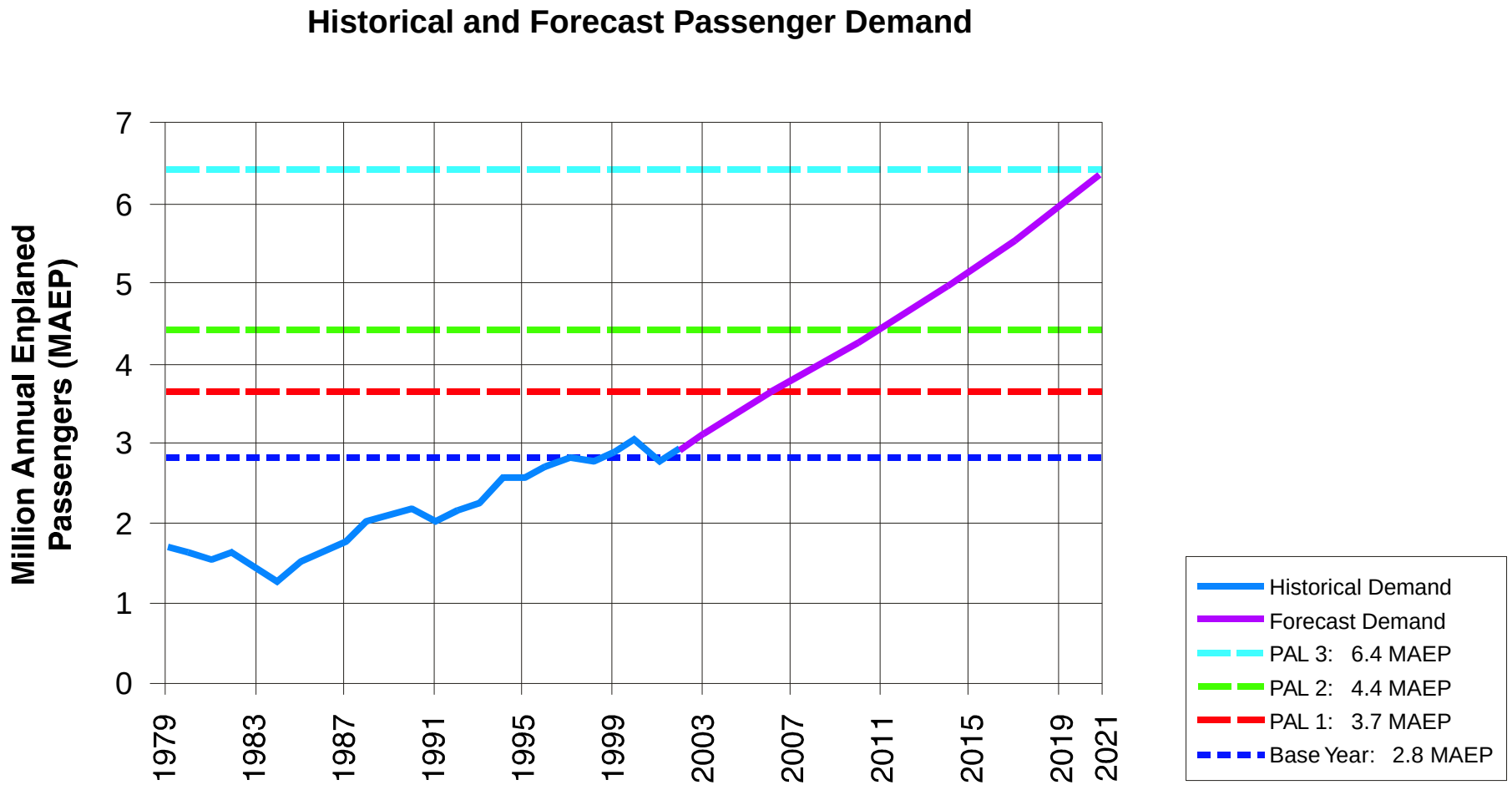
- An important factor in determining the "trigger points" for future terminal improvements (i.e., the dates necessary to begin design and construction) to meet future Planning Activity Levels (PALs), and

- An essential part of assessing the financial viability of a proposed facility improvement.

5.1.1.2 Monthly Demand Pattern

Compared to many U.S. airports, the monthly variation in air passenger traffic at GMIA is relatively moderate. The difference between the highest month (historically March) and lowest month (historically January) is approximately 36 percent. Historically, the highest demand has resulted from the relatively constant year-round business traveler demand plus increased non-business travel during popular vacation travel times. This relatively moderate variation in overall monthly demand has significant benefits in the determination of planning and design demand levels. That is, identifying March as the design peak month does not result in paying a high "premium" over average monthly demand levels.

This monthly demand pattern for calendar year 2000 is presented in **Exhibit 5.1-2**. Note: Calendar year 2000 is the last full year of data not affected by the sharp decline in passenger demand subsequent to the



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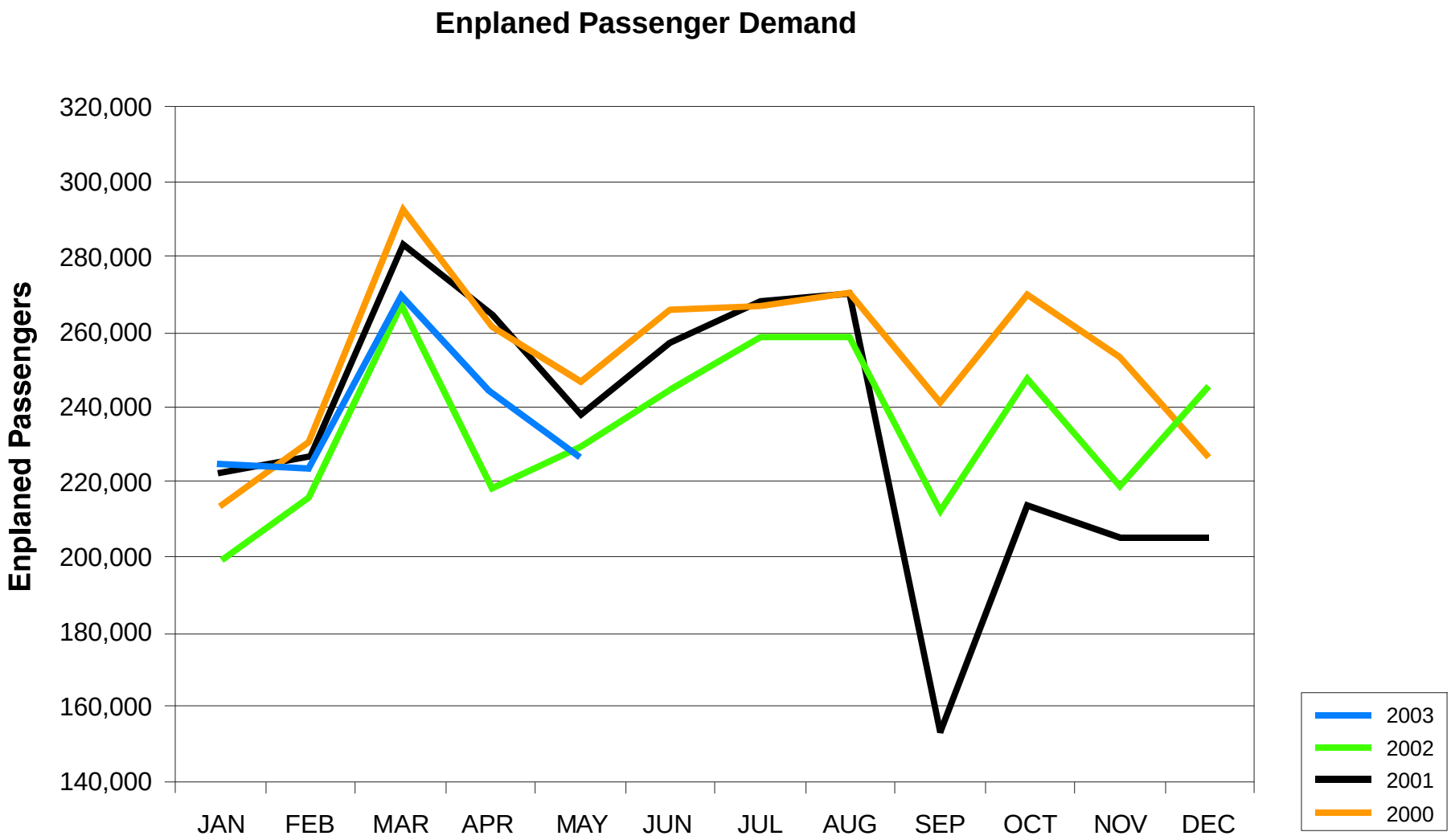
HISTORICAL AND FORECAST PASSENGER DEMAND

EXHIBIT 5.1-1



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ENPLANED PASSENGER DEMAND

EXHIBIT 5.1-2

September 11, 2001 terrorist attacks. As shown on Exhibit 5.1-2, the historical monthly demand patterns did change significantly after September, 2001.

5.1.1.3 Weekly Demand Pattern

Based on Official Airline Guide (OAG) data, the actual aircraft/arrival departure schedules at GMIA do not vary significantly by day of the week. That is, the total number of available aircraft seats is relatively constant. However, based on direct observation, the peak-period load factors vary significantly by day of the week with load factors on Sundays, Mondays, Thursdays and Fridays being somewhat higher than other days of the week.

5.1.1.4 Daily Demand Pattern

The daily aircraft departure demand pattern at GMIA is relatively peaked because of the Airport's high early morning demand from 0600 to 0800 hours followed by several midday peaks resulting from airline hubbing operations. The domestic aircraft arrival peak occurs from 2000 to 2100 hours and is more spiked than the morning domestic departure peak. Combined peak passenger activity from arriving and departing flights is greatest from 1500 to 1600 hours. Based on the projections presented in Chapter 3.0 *Activity Projections*, it is calculated that passenger load factors during these peak periods are in the range of 77 percent on average days in the peak month.

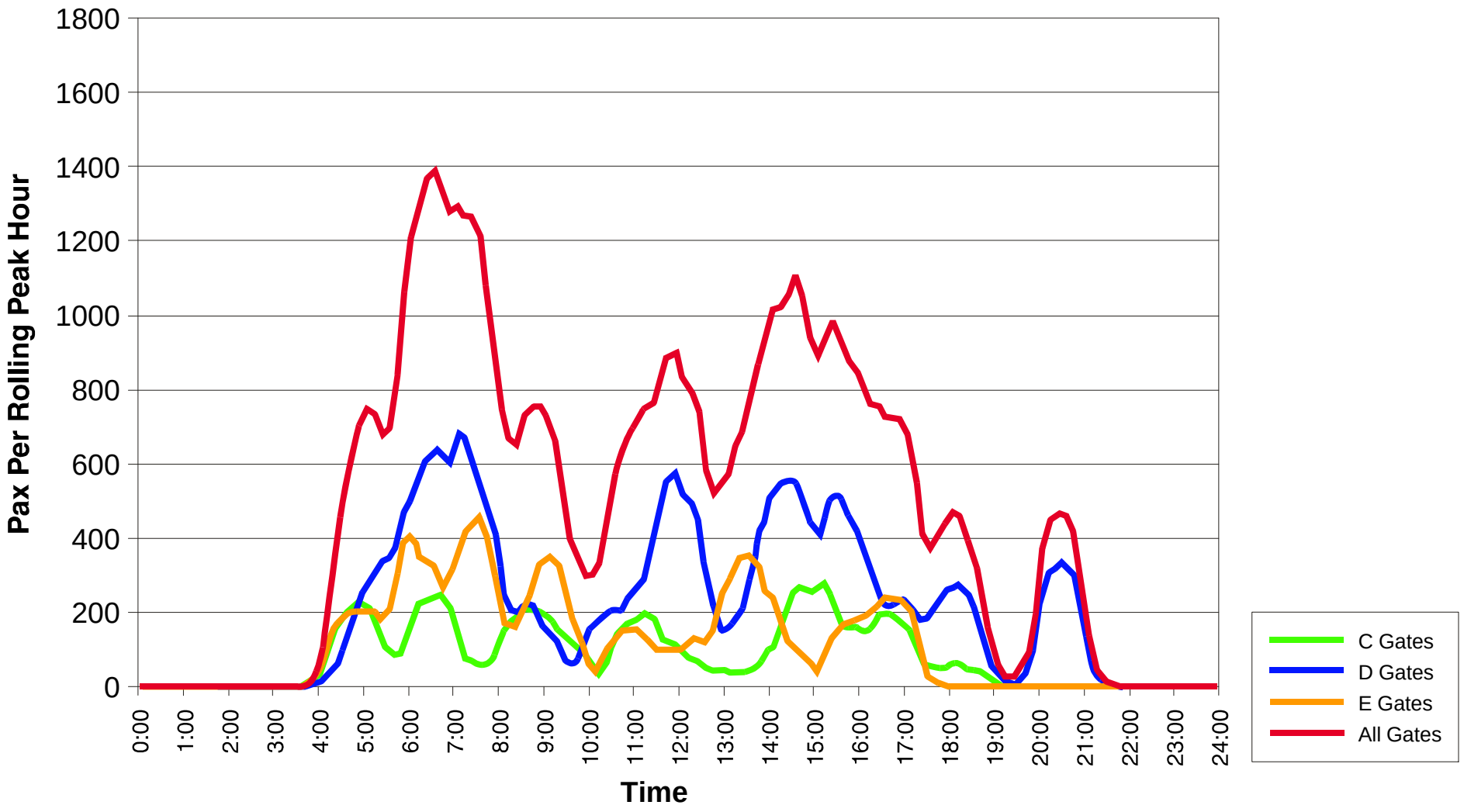
It is also important to consider whether the demand peaks for different airlines occur simultaneously. Almost all airlines operating at GMIA have departing flights operating during the 6 AM to 8 AM morning peak. Therefore, the enplaning peak demand periods for many individual airlines are almost simultaneous.

The current Average Day Peak Month enplaning, deplaning and total passenger demand pattern at GMIA is presented in **Exhibits 5.1-3** and **5.1-4** respectively.

5.1.1.5 Hourly Demand Pattern

Passenger demand within the enplaning peak hour is not completely uniform. Approximately 26 percent of peak hour enplanements occur within a peak 10-minute period. This is an extremely influential demand level to consider, since many facilities requirements (such as ticketing check-in counter, security screening, vertical transportation, etc.) are dependent on meeting this variation in demand within the peak hour.

GMIA Rolling Hour Enplaned Passenger Demand - All Gates
Base Schedule -- 2002



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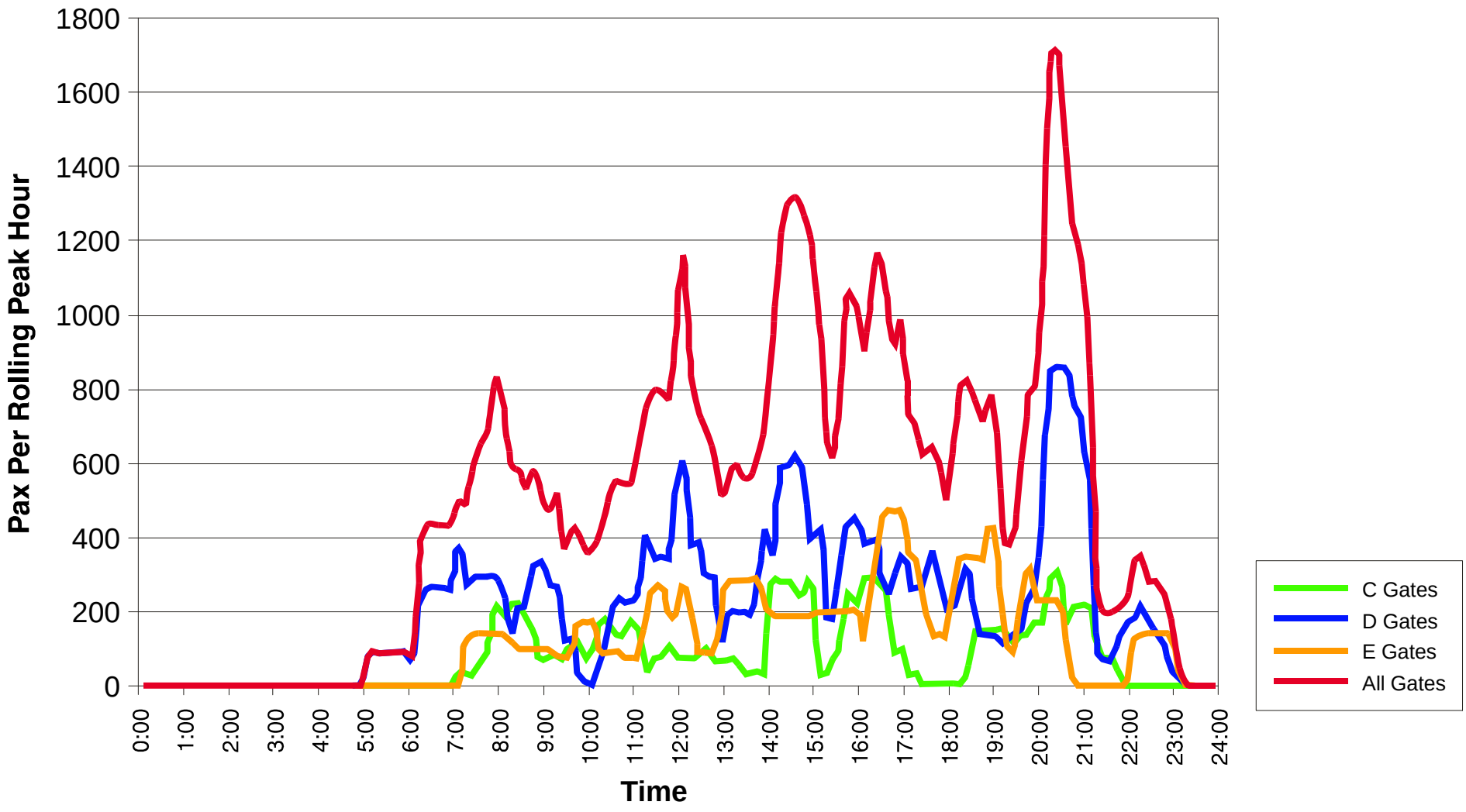
MASTER PLAN UPDATE

PEAK-HOUR ENPLANING DEMAND: ALL GATES

EXHIBIT 5.1-3



GENERAL MITCHELL INTERNATIONAL AIRPORT
MASTER PLAN UPDATE

PEAK-HOUR DEPLANING DEMAND: ALL GATES

EXHIBIT
5.1-4

5.1.1.6 Peak Period Passenger Demand Levels

On the basis of the demand patterns described in Section 2.0, demand levels to be used in the development of terminal requirements are presented in **Table 5.1-1**. Estimates of future demand are expressed as Planning Activity Levels (PALs) and are correlated with the overall capacity to meet demand, as opposed to being matched with the anticipated year in which that specific PAL may be reached. This emphasizes the importance of planning to meet actual future demand levels, as opposed to planning for specific years, which may be affected by increases or decreases in the rate of growth in demand. Also, it should be noted that estimates of peak-hour demand have a much more direct influence on the development of facilities requirements. Hence, the estimates of peak-hour enplaning and deplaning demand were set so as to represent a conservative (i.e., reasonably high) level for each component of demand as it changes over time.

5.1.1.7 Forecast Aircraft Gate Requirements

The primary determinants of terminal throughput of passengers are:

- The number and type of aircraft gates for boarding and deboarding passengers, and
- The actual demand for air travel

Constructing *more gates* than are necessary to meet demand *will not increase* throughput. However, constructing *fewer gates* than are necessary to meet demand *will reduce* airport throughput.

At some airports the number of remain overnight (RON) off-gate aircraft parking positions can influence thoughput by providing staging areas convenient to the active boarding gates. Historically at GMIA the RON parking demand was accommodated by the active boarding/deboarding gates; consequently, no RON parking positions were required.

More recently, however, approximately 5 RON parking positions have been utilized. Consequently, future requirements presented in this document include an allowance for growth in RON parking as a percentage of contact gates.

TABLE 5.1-1

General Mitchell International Airport

ESTIMATED PASSENGER DEMAND SUMMARY

	Planning Activity Levels (PALs)							
	Base Year 2002		PAL 1 2006		PAL 2 2011		PAL 3 2021	
Million Annual Enplaned Passengers	2.8		3.7		4.4		6.4	
Domestic	2.76	98.25%	3.59	98.25%	4.36	98.25%	6.32	98.25%
International	.04	1.75%	0.07	1.75%	0.08	1.75%	0.11	1.75%
Total	2.8	100%	3.7	100%	4.4	100%	6.4	100%
Average Day Peak Month Enplanements								
Domestic	7,770	98.1%	11,122	97.4%	13,549	97.9%	19,762	98.5%
International	150	1.9%	297	2.6%	291	2.1%	301	1.5%
Total	7,920	100%	11,419	100%	13,840	100%	20,063	100%
Peak-Hour Enplanements (including International)								
Originating	1,340	91.3%	1,720	90.3%	1,800	87.8%	2,010	84.3%
Connecting	130	8.7%	180	9.7%	250	12.2%	370	15.7%
Total	1,470	100%	1,901	100%	2,045	100%	2,382	100%
Peak-Hour Domestic Deplanements								
Terminating	1,420	91.3%	1,740	90.3%	1,910	87.8%	2,270	84.3%
Connecting	130	8.7%	190	9.7%	260	12.2%	420	15.7%
Total	1,550	100%	1,930	100%	2,171	100%	2,689	100%
Peak-Hour International Deplanements								
Terminating	150	100%	150	100%	150	100%	150	100%
Connecting	0	0%	0	0%	0	0%	0	0%
Total	150	100%	150	100%	150	100%	150	100%

Source: PB Aviation, Inc.

The recommended fleet mix and aircraft frontage requirements to meet estimated future passenger demand in peak demand periods are presented in **Table 5.1-2**.

TABLE 5.1-2

General Mitchell International Airport

RECOMMENDED FLEET MIX AND AIRCRAFT FRONTAGE REQUIREMENTS

Type of Aircraft	Base Year	PAL 1 2006	PAL 2 2011	PAL 3 2021
Group V: Jumbo	0%	0%	0%	0%
Group IV: Widebody	5%	10%	12%	14%
Group III: Narrowbody	40%	40%	40%	40%
Group II: Regional/Commuter	55%	50%	48%	46%
Total	100%	100%	100%	100%
Annual Enplaned Passengers/Gate	67,000	76,000	78,000	91,000
Estimated Ramp Frontage (in Linear Feet)	4,520	5,200	6,000	7,400

Source: PB Aviation, Inc.

5.1.2 Level of Service Standards

Level of Service (LOS) standards are planning factors used to represent conditions that affect the quality, as opposed to the throughput, of passenger circulation and processing in the terminal. Quantitative factors such as the extent of area allocated per occupant in a public circulation corridor are used to represent the relatively subjective feelings of spaciousness or overcrowding experienced by passengers in that portion of the terminal. The LOS planning factor is applied to the number of occupants (including passengers, well wishers, greeters and employees) who are simultaneously present in that particular terminal component in the design peak period.

One of the most objective statements of passenger LOS utilized in development of terminal programs was developed by the International Air Transport Association (IATA) in their Airport Development Reference Manual (8th Edition, April 1995). As shown in **Table 5.1-3**, these standards describe a very specific extent of area for various terminal components.

TABLE 5.1-3

General Mitchell International Airport

IATA LEVEL OF SERVICE (LOS) STANDARDS

LEVEL OF SERVICE STANDARDS (IN SQUARE FEET/OCCUPANT)						
LOS CATEGORY	A	B	C	D	E	F
Check-in Queue Area	19.35	17.2	15.05	12.9	10.75	See Note 1
Wait/Circulate	29.03	24.76	20.43	16.13	10.75	See Note 1
Hold Room	15.05	12.9	10.75	8.6	6.45	See Note 1
Bag Claim Area (excluding the claim device)	21.5	19.35	17.2	15.05	12.9	See Note 1
Government Inspection Services (GIS)	15.05	12.9	10.75	8.6	6.45	See Note 1

Source: IATA Airport Development Reference Manual (8th Edition, April 1995)
Note 1: LOS "F" is described as "System Breakdown" by IATA.

The IATA legend describing each LOS is as follows:

A. Excellent level of service; condition of free flow; excellent level of comfort.

B. High level of service; condition of stable flow; very few delays; high level of comfort.

C. Good level of service; condition of stable flow; acceptable delays; good level of comfort.

D. Adequate level of service; condition of unstable flow; acceptable delays for short periods of time; adequate level of comfort.

E. Inadequate level of service; condition of unstable flow; unacceptable delays; inadequate level of comfort.

F. Unacceptable level of service; condition of cross-flows; system breakdown and unacceptable delays; unacceptable level of comfort.

An IATA Level of Service Standard "B" was utilized in the development of facilities requirements as described further in Section 5.1.3. For the categories of space covered by the IATA standards this represents a good level of service for passengers, which is reasonable for an initial statement of overall facilities requirements.

5.1.3 Facility Requirements

In this section, facility requirements are presented for the following major building components:

- *Ticketing/Baggage Check-in*, including check-in queuing, ticketing/baggage check-in counters, airline ticketing offices (ATOs) and outbound baggage handling.

- *Security Screening*, including queuing, Transportation Security Administration (TSA) operations and support areas for checked baggage screening as well as passenger screening checkpoints.

- *Holdrooms*, including seating, gate podiums and backscreens, internal circulation, queuing and an allowance for deplaning circulation aisles.

- *Concessions*, including public access (plus remote support space).

- *Passenger Services*, including restrooms and other non-commercial passenger services.

- *Domestic Baggage Claim*, including inbound baggage handling, claim devices, active claim area and baggage service/storage rooms.

- *Other Airline Space*, including enclosed airline operations, office space, breakroom/ready rooms, clubrooms, etc.

- *Airport and Other Agency Space*, including Airport administration and operations space, Sheriff's Department facilities, Federal Inspection Services (FIS) space, and other regulatory agency space.

- *Public Circulation*, including horizontal and vertical circulation for all public areas, both pre-and post-security.

- *Building Support*, including space for delivery, building storage, employee breakrooms, shops, trash removal, as well as emergency egress circulation and building utilities such as mechanical, electrical, communications and other infrastructure components.

The configuration of each of these building components in the existing terminal is presented in **Exhibits 5.1-5**, **5.1-6** and **5.1-7**.

5.1.3.1 Ticketing/Baggage Check-In

The Ticketing Lobby primarily accommodates enplaning passenger operations. Passengers and well wishers arrive at the terminal via a number of different vehicular access modes (such as private vehicles, taxicabs, courtesy shuttles, etc.) and will utilize different ticket lobby services (such as ticket purchase, ticket reservation changes, issuance of boarding passes, baggage check-in, etc.) Some percentage of the future passengers will also check in at curbside stations immediately outside the ticket lobby.

In an attempt to lower their operating costs, many airlines are currently changing their ticket lobby operations to include greater use of Automated Ticketing Machines (ATMs) and other procedures to reduce staffing and facilities requirements. Consequently, the estimate of overall ticket lobby area requirements includes an allowance for the effects of these alternative processing methods over the long term.

In addition, reflecting the Airport's goal of increasing the efficiency and flexibility of terminal facilities, it is assumed that Common Use Ticketing Equipment (CUTE) will be incorporated in future terminal improvements. This includes ticket counter modules that can support use by different airlines. In calculating future ticket counter requirements, however, no allowance for reduction in ticketing frontage has been incorporated since almost all airlines have departing flights in the morning enplaning peak demand period.

LEGEND			
FACILITY AREA	Sq. Ft.	FACILITY AREA	Sq. Ft.
TICKETING / BAGGAGE CHECK-IN	48,070	DOMESTIC BAGGAGE CLAIM	25,257
SECURITY SCREENING	0	OTHER AIRLINE SPACE	107,109
HOLDROOMS	9,485	AIRPORT AND OTHER AGENCY SPACE	12,198
CONCESSIONS	0	PUBLIC CIRCULATION	59,385
PASSENGER SERVICES	4,086	BUILDING SUPPORT	35,048
			289,638

GENERAL MITCHELL INTERNATIONAL AIRPORT

MASTER PLAN UPDATE

75' 37.5' 0 75' 150'

NORTH

Facilities Areas Ground Level

EXHIBIT 5.1-5

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PB AVIATION, INC.

LEGEND			
FACILITY AREA	Sq. Ft.	FACILITY AREA	Sq. Ft.
TICKETING / BAGGAGE CHECK-IN	0	DOMESTIC BAGGAGE CLAIM	0
SECURITY SCREENING	10,760	OTHER AIRLINE SPACE	3,260
HOLDROOMS	71,713	AIRPORT AND OTHER AGENCY SPACE	18,946
CONCESSIONS	45,554	PUBLIC CIRCULATION	123,611
PASSENGER SERVICES	16,062	BUILDING SUPPORT	18,552
			308,458

GENERAL MITCHELL INTERNATIONAL AIRPORT
MASTER PLAN UPDATE

75' 37.5' 0 75' 150'

NORTH

Facilities Areas Concourse Level

EXHIBIT 5.1-6

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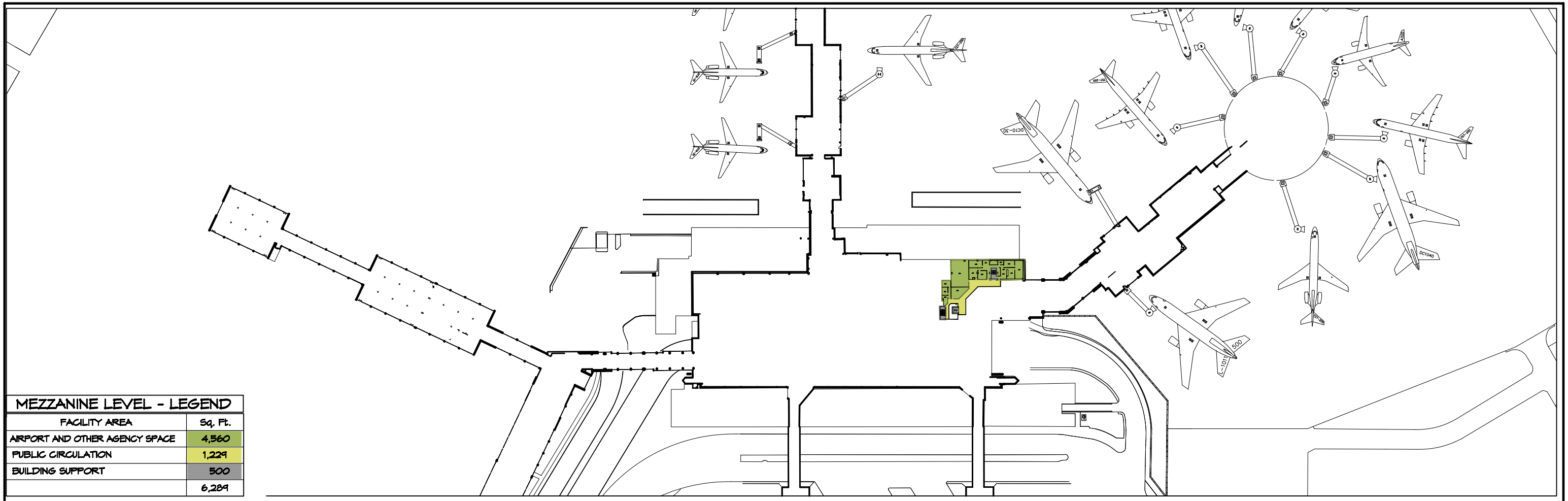
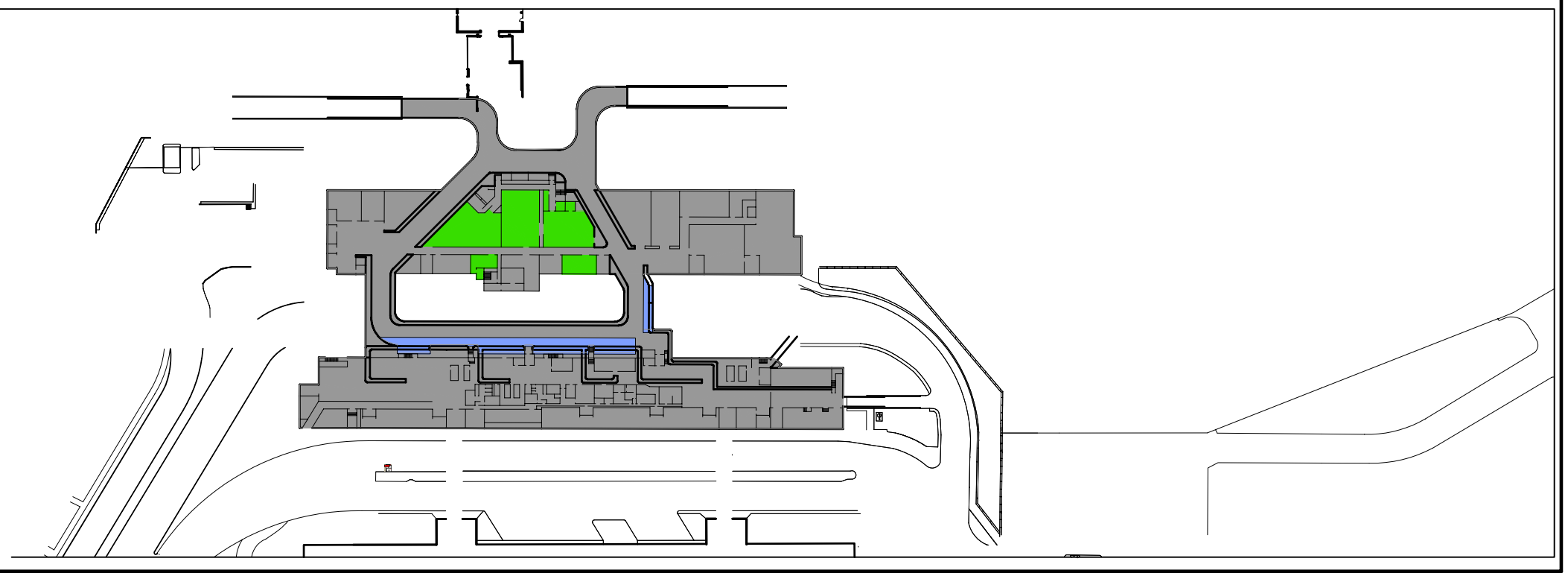
PB AVIATION, INC.



MEZZANINE LEVEL - LEGEND

FACILITY AREA	Sq. Ft.
AIRPORT AND OTHER AGENCY SPACE	4,560
PUBLIC CIRCULATION	1,229
BUILDING SUPPORT	500
	6,289



BASEMENT LEVEL - LEGEND

FACILITY AREA	Sq. Ft.	FACILITY AREA	Sq. Ft.
TICKETING / BAGGAGE CHECK-IN		DOMESTIC BAGGAGE CLAIM	4,353
SECURITY SCREENING		OTHER AIRLINE SPACE	
HOLDROOMS		AIRPORT AND OTHER AGENCY SPACE	
CONCESSIONS	8482	PUBLIC CIRCULATION	
PASSENGER SERVICES		BUILDING SUPPORT	98,264
			111,099

GENERAL MITCHELL INTERNATIONAL AIRPORT
MASTER PLAN UPDATE

75' 37.5' 0 75' 150'

NORTH

Facilities Areas Basement Level and Mezzanine Level

EXHIBIT 5.1-7

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PB AVIATION, INC.

The basic methodology utilized to estimate ticketing requirements at GMIA is to estimate the split between passengers checking bags at curbside versus those using the ticket counter (including passengers checking bags, purchasing tickets, asking for information, etc.)

Estimates of curbside check-in requirements were based on utilization by up to 30 percent of originating passengers. Ticket counter check-in requirements were based on utilization by up to 70 percent of originating passengers. Many airlines are implementing increased use of Automated Ticketing Machines and on-line printing of boarding passes.

Consequently, as shown in the planning factors described below, an allowance for the effects of future increases to airline check-in efficiency is included in the estimate of future check-in counters.

Based on observed processing rates at U.S. airports, the service times for curbside and ticket counter check-in are estimated to be as follows:

- *Ticket Counter Check-in (Domestic flights)*: 2 minutes per transaction per agent.

- *Ticket Counter Check-in (International flights)*: 5 minutes per transaction per agent.

- *Curbside Check-in (only domestic flights are permitted)*: 1 minute per transaction per agent.

Other planning factors utilized are:

- *Peak-Hour Originating Passengers Percentage Chapter 3.0: Activity Projections*: 9.7 percent in PAL 1, 12.1 percent in PAL 2 and 15.7 percent in PAL 3.

- *Peak-Hour Enplaning Load factor Chapter 3.0 Activity Projections*: 77 percent.

- *Passenger Service Goal*: All customers check in within 10 minutes of arriving at ticketing queue.

- *Average Frontage per Airline Agent Position*: 5 feet.

- *Allowance for Effects of Common Use Ticketing Equipment (CUTE)*: 0 percent, since estimates of future ticketing frontage requirements are based on meeting the morning enplaning peak period passenger demand. The primary potential operational benefits of CUTE are to accommodate non-peak period variations in enplaning demand (such as seasonal variations in specific airline demand peaks.)

- *Allowance for Effects of Future Increases in Airline Check-in Efficiency (such as Automated Ticketing Machines and on-line printing of boarding passes)*: -10 percent in PAL 1, -15 percent in PAL 2 and -20 percent in PAL 3.

- *Allowance for unleased counter frontage to accommodate future new incremental shifts in airline demand*: +10 percent (based on a national average for long-range development requirements to provide more timely response to changing airline demand).

The combined effect of applying these planning factors to the estimated peak-hour enplaning demand is summarized in **Table 5.1-4**.

Ticket lobby area requirements are derived from the ticket counter frontage requirements. Allowances for the depth (perpendicular to the ticket counter frontage) of the various components of the ticket lobby are as follows:

- Check-in Queuing Depth: 15 feet

- Ticket Agent Workspace (including counter depth, agent work area and take-away baggage belt depth): 10 feet

- Airline Ticket Offices (ATOs): 25 feet

- Outbound Baggage Handling: 60 feet

TABLE 5.1-4

General Mitchell International Airport

TICKETING/BAGGAGE CHECK-IN FRONTAGE AND AREA REQUIREMENTS

Components	Base Year 2001	PAL 1 2006	PAL 2 2011	PAL 3 2021
No. of Airline Check-in Positions	83	105	113	132
Overall Ticket Counter Frontage (in linear feet)	460	550	560	620
Check-in Queuing Area (in square feet)	6,900	8,250	8,400	9,300
Agent Workspace (in square feet)	4,600	5,500	5,600	6,200
Airline Ticket Offices (ATOs) Area (in square feet)	11,500	13,750	14,000	15,500
Outbound Baggage Handling (in square feet)	27,600	33,000	33,600	37,200
Total	50,600	60,500	61,600	68,200

Source: PB Aviation, Inc.

Concession, restroom, passenger service and public circulation requirements are as described in separate sections of this report.

5.1.3.2 Passenger and Baggage Security Screening

Transportation Security Administration (TSA) regulations for both passenger screening and checked baggage screening have been established and are being applied to 429 U.S. airports. It is likely that these regulations will evolve as operational feedback is available from the first deployments. Therefore, working assumptions for planning future security screening facilities will likely be refined as the initial TSA deployments are assessed.

Passenger Screening Checkpoints

Working assumptions and planning factors utilized for passenger screening checkpoints are as follows:

- Public Utilization: Only ticketed passengers will be permitted through the checkpoint (i.e., no well wishers or greeters).

- Combined Checkpoint: At some point the TSA, the Airport and/or the airlines may wish to combine several individual screening checkpoints into one combined checkpoint. The potential benefits costs and other operational effects of combining the security checkpoints will be addressed in the next phase of the Master Plan Update.

- Passenger Service Goal: All passengers screened within 10 minutes of arriving at the passenger screening queuing area.

- Throughput: Based on the TSA's goal of increased productivity as described in the BWI pilot program, approximately 210 passengers per hour per security screening lane.

- Screening Area Required: Approximately 1,600 sf per lane, including an allowance for queuing.

- Support Area Required: Approximately 4,000 per checkpoint

Checked Baggage Screening

At the time of this writing, GMIA has completed installation of explosive detection system/explosive trace detection (EDS/ETD) equipment in the ticket lobby. As a next step, the Airport is considering relocation of the EDS/ETD equipment to a "Back-of-the-House" installation to free up space in the ticketing lobby. The following working assumptions and planning factors are proposed for the long-range planning of future checked baggage screening:

- *Utilization*: All baggage checked at curbside or at the ticket lobby check-in counter will undergo in-line "Back-of-the-House" Explosive Detection System (EDS) Primary Screening as well as in-line Explosive Trace Detection (ETD) Secondary Screening. Unresolved alarms will require opening bags with or without the passenger present.

- *Protocols and Throughput*: Assuming in-line automated EDS Primary Screening at a rate of 420 bags per hour, 20 percent of those bags will require EDS Secondary at an average rate of 60 seconds per bag; 1 percent of those bags will require open bag search at a rate of 6 minutes per bag.

- *Passenger Service Goal*: All bags screened within 10 minutes of arriving at the EDS screening location. (Note: TSA has not yet established a goal for this criterion.)

- *Screening Area Required*: Approximately 4,000 square feet per EDS/ETD work station, including an allowance for the TSA screening area and in-line conveyor equipment.

- *Support Area Required*: Approximately 2,000 square feet per screening location.

The combined effect of applying these planning factors to the estimated peak-hour enplaning demand is presented in **Table 5.1-5**.

TABLE 5.1-5

General Mitchell International Airport

PASSENGER AND BAGGAGE SECURITY SCREENING REQUIREMENTS

Components	Existing	PAL 1 2006	PAL 2 2011	PAL 3 2021
No. of Passenger Screening Lanes, based on peak 10-minute demand	10	12	13	14
Passenger Screening Checkpoint and Support Area (in square feet)	20,000	23,200	24,800	26,400
Checked Baggage Screening and Support Area (in square feet)	25,000	33,000	39,000	57,000
Total	45,000	56,200	63,800	83,400

Source: PB Aviation, Inc.

5.1.3.3 Holdrooms

The principal determinant of both the extent and overall configuration of the concourse facilities is the requirement to accommodate the estimated future aircraft fleet (described in Section 2.0). The resulting passenger circulation path to and from these aircraft parking

positions requires careful consideration in assessing design alternatives. Industry standards for passenger circulation have been adopted as follows:

- Unassisted Walking Distance from Ticketing to Gates: 800 feet or less preferred, 1,200 feet maximum.

- Level Changes between Ticketing and Gates: 0 preferred, 1 maximum.

Meeting these criteria will be one of the most critical factors in achieving a good level of passenger "acceptance" of the future expansion of the terminal. This is particularly true for the frequent users of the Airport (generally business travelers) who will be evaluating the convenience of future terminal improvements against the relatively short walking distances and travel times in existing Concourses C, D and E, as shown in **Table 5.1-6**.

TABLE 5.1-6

General Mitchell International Airport

COMPARISON OF WALKING DISTANCES

	CONCOURSE C	CONCOURSE D	CONCOURSE E
Average Walking Distance Ticketing to Gates (in feet) – See Note 1	850	1,000	600
Average Walking Time Ticketing to Gates (in minutes) – See Note 2	9.0	9.7	8.8
Level Changes – See Note 3	1	1/2	1

Source: PB Aviation, Inc.
Note 1: Based on walking from mid-point of the ticket counter to the mid-point of holdrooms.
Note 2: Based on an average walking speed of 215 feet/minute and allowing an average of 5 minutes for screening.
Note 3: Two level changes for commuter gates at Concourse D.

Holdroom area requirements for the future terminal improvements are based on the following assumptions:

- Wellwisher Percentage: 0 percent, assume current TSA regulations will continue

- Greeter Percentage: 0 percent, assume current TSA regulations will continue

- Percentage of Enplaning Passengers in Holdroom at Peak: 85 percent

- Area per Occupant: 12.9 square feet based on IATA Level of Service "B"

- Allowance for Gate Podium and Queuing: 200 square feet

- Allowance for Deplaning Aisle: 500 square feet

Applying these planning factors to each of the basic aircraft types in the future fleet mix yields the holdroom area requirements summarized in **Table 5.1-7**.

TABLE 5.1-7

General Mitchell International Airport

HOLDROOM AREA REQUIREMENTS

	Base Year	PAL 1 2006	PAL 2 2011	PAL 3 2021
Total Area (in square feet)	64,000	70,000	82,000	106,000

Source: PB Aviation, Inc.

5.1.3.4 Concessions

Concession development has two significant components:

- Primary Concessions, essentially a central concessions court area conveniently accessible to all enplaning passengers along their circulation path to the holdrooms.

- Secondary Concessions, essentially concession areas conveniently accessible to passengers within close proximity (300 feet) of holdrooms.

The physical relationship between the Ticket Lobby, the Passenger Security Screening location(s) and the holdrooms will greatly influence the type, location, configuration, convenience and financial viability of the Primary Concessions. The proximity of Secondary Concessions to individual holdrooms plus the mode of access to/from these holdrooms will greatly influence the type, location, configuration, convenience and financial viability of the Secondary Concessions. For these reasons, the interrelationship of concessions, security screening and public circulation will have a significant influence on both the level of service to passengers and revenue generation to the Airport.

Concession requirements described in this report are based on the area required to accommodate peak period circulation of passengers, as well as an allowance for the additional demand from employees. For each concession type and location, an estimate was made of the percentage of passengers who would patronize that specific concession (i.e., the "capture rate").

A summary of requirements for concession facilities is described in **Table 5.1-8**.

TABLE 5.1-8

General Mitchell International Airport

CONCESSION AREA REQUIREMENTS

Components	Base Year 2002	PAL 1 2006	PAL 2 2011	PAL 3 2021
Ticket Lobby Concessions (in square feet)	1,000	1,500	2,000	3,000
Central Concessions (in square feet)	23,000	29,000	32,000	37,000
Concourse Concessions (in square feet)	21,000	24,000	28,600	35,700
Baggage Claim Concessions (in square feet)	1,000	1,500	2,000	3,000
Total	46,000	56,000	64,600	78,700

Source: PB Aviation, Inc.

5.1.3.5 Passenger Services

The same working assumptions about basic passenger circulation were applied to the extent and distribution of public restrooms and other non-commercial passenger services.

A summary of Passenger Services requirements is presented in **Table 5.1-9**.

TABLE 5.1-9

General Mitchell International Airport

PASSENGER SERVICES REQUIREMENTS

Components	Base Year 2001	PAL 1 2006	PAL 2 2011	PAL 3 2021
Public Restrooms (in square feet)	18,000	25,400	30,300	44,400
Airport Space (such as Children's Play Areas, First Aid, Lost and Found, etc.) (in square feet)	2,500	2,900	3,400	4,200
Total	20,500	28,300	33,700	48,600

Source: PB Aviation, Inc.

5.1.3.6 Domestic Baggage Claim

Domestic Baggage Claim is an essential operational component for passengers claiming baggage and/or transferring to various ground transportation modes. This space is also an essential part of the Airport's goal of providing a welcoming environment for arriving passengers. For business travelers this arrival experience must include efficiency in transfer to rental cars and other commercial vehicles, but must also acquaint the arriving passenger with the energy and diversity of the Greater Milwaukee Area and the region.

The facilities requirements for domestic baggage claim are primarily dependent on the number, type, and load factor of aircraft arriving in a peak 20-minute period. Since the arriving aircraft schedule can sometimes vary significantly from the existing flight schedule, an

allowance for schedule variations is incorporated into the estimate of aircraft arrival demand. In addition, the number of each type of arriving flights that can share a baggage claim device is important to consider, especially in an airport like GMIA where there are many carriers sharing overall market.

To reduce operational problems, it is advisable to provide a sufficient number of claim devices so that different airlines (or different ground handlers) are not required to compete for the operation of a device.

Consequently the following working assumptions were utilized in developing estimates of baggage claim requirements:

- *Checked Bags per Passenger*: 1.25
- *Percentage of total bags displayed in claim device at peak*: 30 percent
- *Depth of Positive Claim*: 15 feet (perpendicular to the baggage claim frontage)
- *Occupancy Time of Device by Aircraft Type*: 40 minutes for Group IV (widebodies), 30 minutes for Group III (narrowbodies), 20 minutes for commuter aircraft
- *Number of simultaneous aircraft on one device by type*: one (1) widebody, two (2) narrowbodies, or three (3) commuter aircraft

The configuration and arrangement of domestic baggage claim devices should be modular (i.e., all devices should provide a minimum of 150 to 160 feet of frontage) so that the devices can be assigned to individual airlines more flexibly. The layout of the devices should be easily comprehensible to arriving passengers who checked bags and should not be in the circulation path of those passengers who do not check bags.

Greeters should be provided with convenient public seating and exhibit areas with a clear view of all major arriving passenger circulation. Areas for restrooms and public circulation are described in other sections of this report.

A summary of domestic baggage claim spaces is presented in **Table 5.1-10**.

5.1.3.7 Other Airline Space

In addition to the airline ticketing and baggage claim space described above, airline support space includes many specialized functions:

- *Airline clubrooms*
- *Airline offices*
- *Ground handler offices*
- *Breakrooms and ready-rooms*
- *Provisions storage*
- *Enclosed storage*

TABLE 5.1-10

General Mitchell International Airport

DOMESTIC BAGGAGE CLAIM REQUIREMENTS

Components	Base Year 2002	PAL 1 2006	PAL 2 2011	PAL 3 2021
Domestic Baggage Claim				
No. of conveyors	5	6	7	8
Total Claim Frontage (in linear feet)	670	720	890	970
Total Claim Area (in square feet)	20,400	21,600	26,700	29,100
Inbound Baggage Handling (in square feet)	22,300	23,400	28,100	34,200
Baggage Service Offices (in square feet)	3,600	3,900	4,800	5,300
Ram Action Center (RAC) Area (in square feet)	2,400	2,900	3,200	3,800
Total	48,700	51,800	62,800	72,400

Source: PB Aviation, Inc.

In addition to the fully enclosed areas described above, airlines will also require exterior covered space for ramp vehicles and other parts and equipment. This covered exterior space is not included in the facilities area tabulation.

The area requirement for enclosed airline operations area is based on a 50 percent increase per gate from the area provided at the existing Terminal.

The area requirements for Other Airline Space are presented in **Table 5.1-11**.

TABLE 5.1-11

General Mitchell International Airport

OTHER AIRLINE AREA REQUIREMENTS (IN SQUARE FEET)

Components	Base Year 2002	PAL 1 2006	PAL 2 2011	PAL 3 2021
Airline Clubrooms (in square feet)	4,000	4,000	4,000	6,000
Airline Operations Space (in square feet)	105,000	120,000	142,500	177,500
Airline Concourse Offices and Customer Service Counters (in square feet)	1,000	1,000	1,500	2,000
Total	110,000	125,000	148,000	185,500

Source: PB Aviation, Inc.

5.1.3.8 Airport and Other Agency Space

In addition to the key operational components described above, the Terminal Area also accommodates several administrative and regulatory support space, including:

- Airport Offices: Space has been allocated for Airport Operations Offices (such as Terminal Operations, Airfield Operations and Sheriff's Department), which require convenient access to both the airside and landside portions of the terminal. In addition, an allowance is included in the program for Other Airport Support Space (such as employee locker rooms, breakrooms, briefing rooms, maintenance shops, delivery docks, trash rooms, etc.)

- Federal Inspection Services (FIS): Facilities are provided for processing of arriving international passengers. At the planning phase, facilities requirements for FIS facilities are essentially a statement that the FIS Guidelines (currently being updated) will be followed for a certain estimated arriving passenger demand level. The demand level established in Chapter 3.0*: Activity Projections* was 150 arriving international passengers per hour for all three future PALs. Consequently, facilities requirements are assumed to remain constant through PAL 2; however, an allowance for a future increase in FIS requirements, even for the same demand level, is included for PAL 3.

- Other Agency Space: Facilities are provided to accommodate other agencies such as the Sheriff's Office, etc.

Area requirements for these components are presented in **Table 5.1-12**.

TABLE 5.1-12

General Mitchell International Airport

AIRPORT AND OTHER AGENCY AREA REQUIREMENTS

Components	Existing Area	PAL 1 2006	PAL 2 2011	PAL 3 2021
Airport Space (in square feet)	35,000	40,000	47,000	59,000
FIS Facilities (in square feet)	15,000	15,000	15,000	30,000
Other Agency Space – Note 1 (in square feet)	1,000	1,000	1,000	2,000
Total	51,000	56,000	63,000	91,000

Source: PB Aviation, Inc.
Note 1: Area for TSA security screening operations and support space are show above in Section 5.1.3.2.

5.1.3.9 Public Circulation and Building Support

In addition to the key operational space described above, there are two categories of space necessary to support terminal operations:

- Public Circulation includes both horizontal and vertical circulation space.

- Building Support includes space for delivery, building storage, employee breakrooms, shops, and trash removal, as well as building utilities such as mechanical, electrical, communications and other infrastructure components.

The area requirements are presented in **Table 5.1-13**.

TABLE 5.1-13

General Mitchell International Airport

PUBLIC CIRCULATION AND BUILDING SUPPORT (SQUARE FEET)

Components	Base Year 2002	PAL 1 2006	PAL 2 2011	PAL 3 2021
Public Circulation (in square feet)	191,000	221,000	255,000	322,000
Building Support (in square feet)	138,000	159,000	183,000	232,000
Total	329,000	380,000	438,000	554,000

Source: PB Aviation, Inc.

5.1.3.10 Building Area Summary

Area requirements for the major operational components of the Centralized Terminal are summarized in **Table 5.1-14**. As indicated, there is an existing deficiency in the ticketing/baggage check-in, security screening, and baggage claim areas of the terminal.

The total space requirements for the terminal increase from 765,000 square feet in the base year to 1,288,000 square feet in PAL 3.

TABLE 5.1-14

General Mitchell International Airport

TERMINAL AREA REQUIREMENTS SUMMARY (IN SQUARE FEET)

Major Terminal Components	Existing Area	Base Year 2002	PAL 1 2006	PAL 2 2011	PAL 3 2021
Ticketing/Baggage Check-in	43,100	50,600	60,500	61,600	68,200
Security Screening	10,800	45,000	56,200	63,800	83,400
Holdrooms	73,800	64,000	70,000	82,000	106,000
Concessions	54,000	46,000	56,000	64,600	78,700
Passenger Services	20,100	20,500	28,300	33,700	48,600
Domestic Baggage Claim	29,600	48,700	51,800	62,800	72,400
Other Airline Space	110,400	110,000	125,000	148,000	185,500
Airport and Other Agency Space	50,700	51,000	56,000	63,000	91,000
Public Circulation	185,600	191,000	221,000	255,000	322,000
Building Support	152,400	138,000	159,000	183,000	232,000
Gross Building Area (rounded to nearest 1,000 sf)	731,000	765,000	884,000	1,018,000	1,288,000

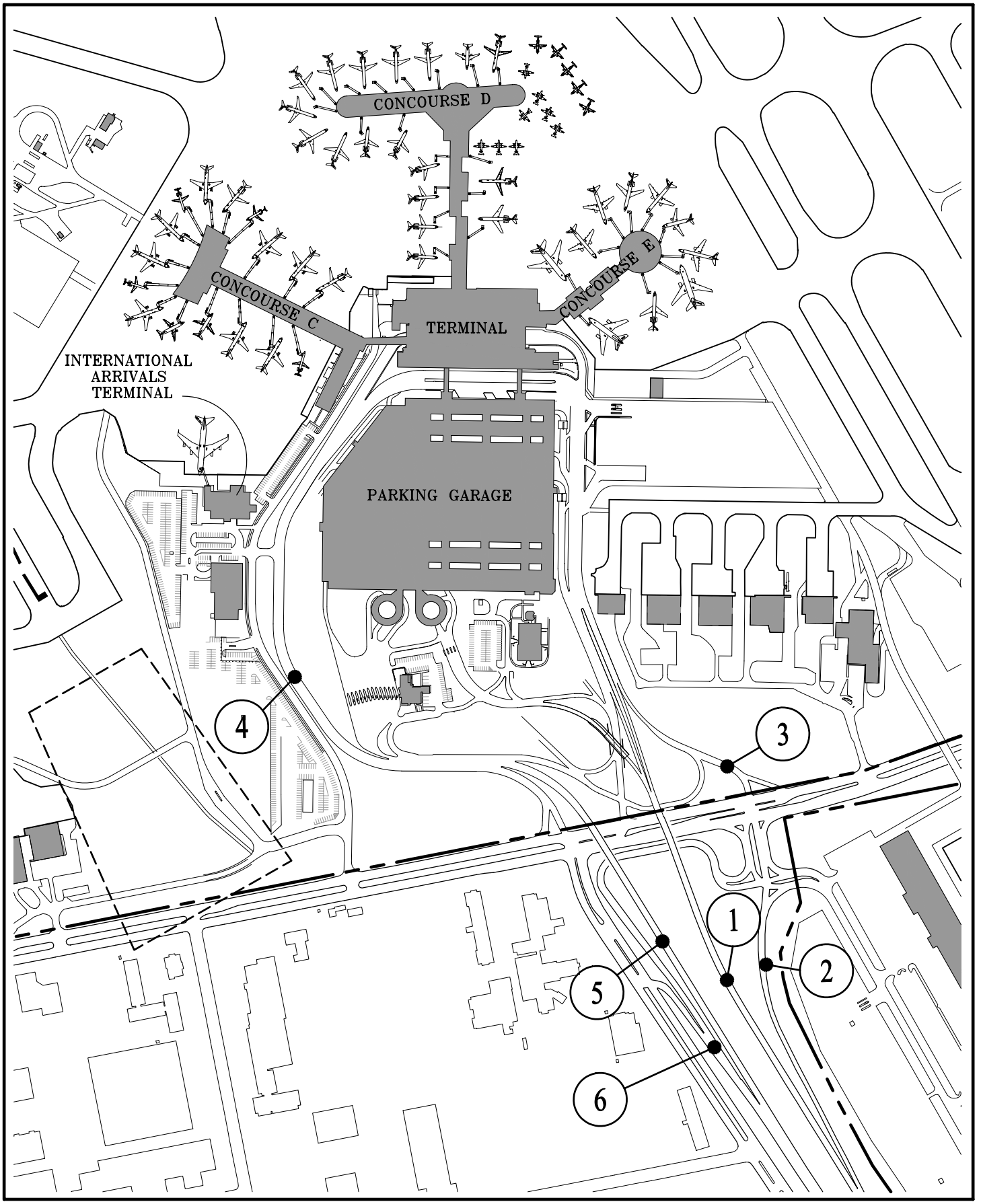
Source: PB Aviation, Inc.

5.2 AIRPORT ACCESS AND CURBFRONT REQUIREMENTS

Access requirements for the Airport are presented for both circulation roadways and the terminal curbfront.

5.2.1 Airport Roadway Access

In order to examine the capacities of the Airport's roadway network, traffic counts were conducted at six locations – for a period of seven consecutive days in November 2002. **Exhibit 5.2-1** depicts these locations. Location 1 was inbound on the Airport Spur which counted Airport traffic prior to the exits for parking and rental car return. Location 2 counted traffic exiting the Airport Spur at Howell Avenue. Location 3 was the ramp from Howell Avenue into the Airport (prior to the turn for parking and rental car return. Location 4 was located on the terminal exit roadway. Location 5 picked up traffic on the Airport spur



GENERAL MITCHELL INTERNATIONAL AIRPORT
MASTER PLAN UPDATE

Traffic Count Locations

EXHIBIT
5.2-1

Milwaukee\Exhibits\traf-count-loc.dwg 10/03

PB AVIATION, INC.

exiting the Airport prior to the entrance ramp from Howell and Grange Avenues which were recorded as Location 6. Traffic counts on Howell Avenue were obtained from previous studies and Wisconsin Department of Transportation (DOT).

The data collected provided the baseline traffic or a portrayal of "typical" traffic vehicular circulation patterns around the Airport terminal covering all types of traffic for inbound, outbound and through movements. Base year (2001) traffic was adjusted with traffic growth rates based on growth rates of passenger activity forecasts. These data were used to determine Level-of-Service (LOS), a descriptive term used to characterize traffic flow and operations in terms of three variables: speed, density and service flow. Traffic LOS is calculated numerous ways using a number of traffic operating characteristics such as speed, volume, and density as prescribed by the Institute of Transportation Engineer's Highway Capacity Manual (HCM).

The categorical exclusion report for the GMIA parking garage expansion (Mead & Hurt, 1999) states that the Airport Spur (STH 119) and Howell Avenue account for 100 percent of all Airport access and egress traffic; about 75 percent of traffic uses the Airport spur and 25 percent uses Howell Avenue. The airport related traffic volume on Howell Avenue is estimated as 5 percent of facility volume. About 35 percent of traffic on the Airport Spur that connects the terminal area with I-94 is regarded to be airport related, with the remainder exiting at Howell Avenue. The Airport Spur currently operates at LOS B in the morning rush-hour, the LOS for Howell Avenue in the morning was not cited.

As presented in **Table 5.2-1**, LOS calculations were directly based on volume to capacity ratios (V/C), a calculation that divided peak-hour traffic counts by ideal HCM capacity of the individual lane on the particular roadway segments. Assumed capacity was based on the type of roadway under consideration and multiplied by the appropriate number of lanes. For instance, a roadway that theoretically could handle 1,000 vehicles per hour on a one lane segment and has an observed peak-hour vehicle flow of 500 would yield a V/C

ratio of 0.50. Adjustments were made to roadway capacity levels, as appropriate, for the Airport's access roads in accord with several technical publications that show that airport roadways have lower vehicle throughput than standard roads due to driver behavior, numerous weaving movements and low speeds.

TABLE 5.2-1

General Mitchell International Airport

ROADWAY LEVELS OF SERVICE (LOS) AND VOLUME-TO-CAPACITY (V/C) RATIOS

Level of Service (LOS)	Volume-to-Capacity (V/C)Ratio	Description
A	< 0.60	Free Flow Conditions. General level of comfort and convenience provided to motorist is excellent.
B	0.61 - 0.70	Stable flow. The level of comfort and convenience provided is somewhat less than a LOS A
C	0.70 - 0.80	Stable flow with increases in vehicle density noticed. The general level of comfort and convenience declines noticeably at this level.
D	0.81 - 0.90	High density, but stable flow. Restricted speeds and maneuverability severely restricted with generally poor driver comfort levels and convenience.
E	0.91 – 1.00	Operating conditions near or at capacity. Low speeds and maneuverability extremely difficult. Comfort and convenience levels are extremely poor, and driver frustration is generally high.
F	> 1.00	Forced or unstable traffic flow. This condition exists wherever the amount of traffic approaching a point exceeds the facility capacity. Queues and significant driver delays are experienced.

Source: Transportation Research Board, 1985 *Highway Capacity Manual, Special Report 209.*

The resulting 2001 AM peak hour service levels for the Airport's internal circulation roadways are summarized in **Table 5.2-4**. This analysis assumes that traffic volume on all these facilities increases at the rate of airport passenger growth projected in PAL 3, which overstates the likely future traffic volume, particularly on Howell Avenue connections, but provides a worst case scenario.

The Airport Spur connection to the terminal appears to be in sound condition with capacity for future traffic growth projected at the terminal. Howell Avenue, where non-airport traffic dominates appears to have AM peak-hour congestion that could grow worse in the future with added airport traffic and regional background traffic growth under a worst case scenario. In particular

ramps between the Airport spur and Howell Avenue appear to have low LOS ratings now that could grow worse in the future.

TABLE 5.2-2

General Mitchell International Airport

AM PEAK HOUR ROADWAY LEVELS OF SERVICE

	Base Year 2001		PAL 1 2006		PAL 2 2011		PAL 3 2021	
Airport Roadway Segment (1)	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
Airport Spur Eastbound (STH 119)	0.40	A	0.50	A	0.55	A	0.62	A
Airport Spur Westbound (STH 119)	0.08	A	0.10	A	0.10	A	0.12	A
Ramp from Airport Spur to Howell Ave. (STH 38)	0.95	E	1.10	F	1.20	F	1.30	F
Ramp from Howell Ave (STH 38) to Terminal Loop	0.70	C	0.95	E	0.98	E	1.08	F
Outbound Terminal Roadway	0.33	A	0.42	A	0.44	A	0.49	A
Howell Avenue (STH 38) *	0.64	B	0.82	D	0.87	D	0.96	E

Source: PB Aviation, Inc. Analysis

(1) All roadway segments one-way unless otherwise noted.

* Two-way roadway – LOS considers both directions – AM peak-flow can not be determined – LOS depends on signal timing and are estimates

5.2.2 Curbfront Requirements

The enplaning and deplaning curbsides are the locations at which passengers transition between vehicles and the terminal. Typically, passengers arrive and depart in one of many different types of vehicles, such as, private cars and taxis, to hotel shuttle buses, parking lot shuttle buses and city buses. Each of these types of vehicles takes up a different amount of space at the curb and each tends to stay or dwell at the curb for varying lengths of time. All of these factors must be taken into account when determining the length of the departure curb in front of the terminal. The mode of transportation at the curb and the average dwell time were based on national averages at U.S. airports confirmed by a survey of curbfront dwell times at GMIA.

The working assumptions and resulting requirements for dropoff curbside frontage are summarized in **Table 5.2-3**.

TABLE 5.2-3

General Mitchell International Airport

DROPOFF CURBSIDE ROADWAY REQUIREMENTS

Category	Mode Split[1]	Avg. Vehicle Occupancy (not incl. drivers[2])	Avg. Dwell Time (in minutes[3])	Length of Curbside Req'd incl Maneuvering (in feet[4])	Base Year 2001	PAL 1 2006	PAL 2 2011	PAL 3 2021
Enplaning Pax per hour[5]					1,470	1,901	2,045	2,382
Originating Pax per hour[5]					1,338	1,711	1,800	2,001
Wellwishers per hour[6]					74	95	102	119
Vehicle Occupant Demand per hour (not incl. drivers)					1,412	1,806	1,902	2,120
Vehicles Not Using Curbsides								
Garage, Private Car	36.8%							
Garage, RAC	13.8%							
Vehicles Using Curbsides								
Private Car	34.4%	1.5	2	25	275	350	375	425
Taxi	4.5%	1.5	3	25	75	75	75	100
Hotel/Motel Shuttle Bus	4.8%	5	5	40	80	80	80	80
For Hire Shuttle Van	1.9%	3	3	30	30	30	30	30
Limo	2.1%	1.5	3	30	30	60	60	60
Public Bus	0.3%	12	8	55	55	55	55	55
Other	1.6%	1.5	3	40	40	40	80	80
Total: Dropoff Curbside Frontage	100%				585	690	755	830

Source: PB Aviation, Inc.

Notes:
[1] Mode Splits based on data from GMIA.
[2] Average Vehicle Occupancy based on data from other U.S. airports.
[3] Dwell Times based on data from other U.S. airports and direct observation at GMIA.
[4] Length of Curbside Required based on data from other U.S. airports.
[5] Based on PB Aviation Forecast.
[6] Based on observations at other U.S. airports. No data available for GMIA.

The resulting requirements for pickup curbside frontage are summarized in Table 5.2-4.

TABLE 5.2-4

General Mitchell International Airport

PICKUP CURBSIDE ROADWAY REQUIREMENTS

Category	Mode Split[1]	Avg. Vehicle Occupancy (not incl. drivers[2])	Avg. Dwell Time (in minutes[3])	Length of Curbside Req'd incl Maneuvering (in feet[4])	Base Year 2001	PAL 1 2006	PAL 2 2011	PAL 3 2021
Deplaning Pax per hour[5]					1,550	1,930	2,171	2,689
Terminating Pax per hour[5]					1,411	1,737	1,910	2,259
Greeters per hour[6]					78	97	109	134
Vehicle Occupant Demand per hour (not incl. drivers)					1,489	1,834	2,019	2,393
Vehicles Not Using Curbsides								
Garage, Private Car	36.8%							
Garage, RAC	13.8%							
Vehicles Using Curbsides								
Private Car	34.4%	1.5	2	25	450	550	600	700
Taxi	4.5%	1.5	4	25	75	100	125	125
Hotel/Motel Shuttle Bus	4.8%	5	8	40	80	120	120	160
For Hire Shuttle Van	1.9%	3	4	30	30	30	30	60
Limo	2.1%	1.5	4	30	60	60	60	90
Public Bus	0.3%	12	8	55	55	55	55	55
Other	1.6%	1.5	3	40	40	40	80	80
Total: Pickup Curbside Frontage	100%				790	955	1,070	1,270

Source: PB Aviation, Inc.

Notes:
1 Mode Splits based on data from GMIA.
2 Average Vehicle Occupancy based on data from other U.S. airports.
3 Dwell Times based on data from other U.S. airports and direct observation at GMIA.
4 Length of Curbside Required based on data from other U.S. airports.
5 Based on PB Aviation Forecast.
6 Based on observations at other U.S. airports. No data available for GMIA.

5.3 PARKING REQUIREMENTS

This section reviews the historical and planned parking supply at the Airport. Highlights of the historical trend in parking demand are presented and projections of parking demand are developed for 2006, 2011, and 2021.

5.3.1 Airport Parking Supply

Table 5.3-1 presents a breakdown of the parking supply at the Airport in 2001 and the projected supply over the forecast period. There were 11,704 parking spaces at the Airport in 2001. Of these, 9,553 (81.6 percent) were designated public parking spaces and the remaining 2,151 (18.4 percent) were

designated non-public parking spaces. The Garage (hourly and daily) accounted for 62 percent of the public parking spaces, Remote Lots A and B accounted for 31 percent, and the Surface Lot accounted for the remaining 7 percent. The non-public parking spaces were allocated for use by the rental car companies, Airport and tenant employees (including one area designated for employees of Midwest Airlines), service delivery vehicles, taxi staging area, and limousine staging area.

TABLE 5.3-1

General Mitchell International Airport

PUBLIC AND NON-PUBLIC PARKING SUPPLY

	Number of Parking Spaces	
Public Parking Facilities	2001	2003
Garage – Hourly	723	1,252
Garage – Daily	5,202	7,314
Subtotal – Garage [1]	5,925	8,566
Surface Lot [2]	691	575
Remote Lot A [3]	1,611	1,836
Remote Lot B [4]	1,326	1,184
Total Public Parking Spaces	**9,553**	**12,161**
Non-Public Parking Facilities		
Midwest Express Airlines [3]	165	0
Rental Car Parking	400	950
Employee Parking	1,503	1,503
Taxi Staging Area	40	40
Limousine Staging Area	23	23
Delivery Vehicle Parking	20	20
Total Non-Public Parking Spaces	**2,151**	**2,536**
Total Airport Parking Spaces	**11,704**	**14,697**

[1] Phase 1 of the new garage project opened in late November 2002.
[2] The number of spaces in the Surface Lot decreased following the construction of a ground transportation roadway in late 2001.
[3] Parking spaces reserved for Midwest Airlines, located in Remote Lot A, were increased to 225 in 2002. However, the Airport will regain those spaces from Midwest Airlines in February 2003 and revert them to public parking spaces, thereby increasing the number of public parking spaces in Remote Lot A to 1,836.
[4] Historically, Remote Lot B was opened in the Spring and in October through December primarily to serve the overflow traffic from Remote Lot A. Over the forecast period, Remote Lot B will provide 1,184 spaces year-round and an additional 950 spaces during peak parking periods.

Source: General Mitchell International Airport Staff

Several developments have taken place since 2001 and additional developments are planned in the near future, including:

The completion of Phase 1 of the new garage construction project in late November 2002 added 2,951 daily garage parking spaces. In conjunction with this project improvements were made to the existing garage, which resulted in an additional 240 parking spaces.

Following the completion of Phase 1 of the new garage, the number of spaces in the existing garage assigned to the rental car companies was increased from 400 to 950 spaces, effective January 2003.

The above changes resulted in a net increase of 2,641 public parking spaces in the garages, bringing the total number of public parking spaces at the Airport to 12,161, representing a 27 percent increase over public parking spaces available in 2001.

In previous years, parking spaces reserved for Midwest Airlines to use as overflow parking for its maintenance staff were located in Remote Lot A. However, following the reduction of its maintenance staff, Midwest Airlines notified the Airport that it can meet the parking needs of its maintenance staff with the parking spaces located next to the airline's maintenance hangar. Effective February 2003, the Airport regained the 225 spaces assigned to Midwest Airlines, and reverted them to public spaces in Remote Lot A, which increased the number of public parking spaces in Remote Lot A to 1,836.

Historically, Remote Lot B was opened in the spring and in October through December, primarily to serve the overflow traffic from Remote Lot A. Remote B also served as a stand-by lot for use when Remote A was undergoing maintenance work. However, the Airport plans to keep Remote B open to provide 1,184 spaces year-round and an additional 950 spaces during peak periods.

Parking facility planners typically make a distinction between actual parking supply and effective parking supply. Effective parking supply incorporates assumptions about efficiency and an acceptable level of service that the parking provider wishes to offer their customers. Consequently, effective parking supply is usually lower than the actual parking supply to allow for various parking contingencies, including vacancies resulting from improperly parked vehicles, maintenance work, and to provide room for circulating traffic. It is typical for an allowance of 10-15 percent to be allocated to such parking contingencies and for high traffic areas to be allocated a relatively higher allowance.

For the purpose of assessing public parking requirements at the Airport, two alternative levels of service (LOS) were defined: LOS A and LOS B.

LOS A assumes a 15 percent parking contingency allowance in the Garage Hourly facility and a 10 percent allowance in all other parking facilities. Under LOS A, actual public parking supply of 9,553 spaces in 2001 translates into an effective public parking supply of 8,562 spaces. Similarly, actual parking supply of 12,161 spaces in 2006-2021 translates into an effective parking supply of 10,882 spaces.

LOS B assumes a 5 percent parking contingency allowance in the Garage Hourly facility and a 3 percent allowance in all other parking facilities. Under LOS B, actual parking supply of 12,161 spaces in 2006-2021 translates into 11,771 spaces. LOS B provides a smaller parking contingency allowance than LOS A, and therefore represents a relatively lower level of efficiency and service.

Table 5.3-2 presents the breakdown of the effective supply under LOS A and LOS B.

TABLE 5.3-2

General Mitchell International Airport

EFFECTIVE PUBLIC PARKING SUPPLY

	2001	2006	2011	2021
Actual Public Parking Supply[1]				
Garage – Hourly	723	1,252	1,252	1,252
Garage – Daily (includes New Garage Phase 1)	5,202	7,314	7,314	7,314
Surface Lot	691	575	575	575
Remote Lot A	1,611	1,836	1,836	1,836
Remote Lot B	1,326	1,184	1,184	1,184
All Facilities	9,553	12,161	12,161	12,161
Effective Public Parking Supply – LOS A[2]				
Garage – Hourly	615	1,064	1,064	1,064
Garage – Daily (includes New Garage Phase 1)	4,682	6,583	6,583	6,583
Surface Lot	622	518	518	518
Remote Lot A	1,450	1,652	1,652	1,652
Remote Lot B	1,193	1,066	1,066	1,066
All Facilities	8,562	10,882	10,882	10,882
Effective Public Parking Supply – LOS B[2]				
Garage – Hourly	687	1,189	1,189	1,189
Garage – Daily (includes New Garage Phase 1)	5,046	7,095	7,095	7,095
Surface Lot	670	558	558	558
Remote Lot A	1,563	1,781	1,781	1,781
Remote Lot B	1,286	1,148	1,148	1,148
All Facilities	9,252	11,771	11,771	11,771

[1] See Table 5.3-1

[2] Effective parking supply is defined in terms of acceptable level of service (LOS). Effective supply allows for various parking contingencies, including vacant spaces resulting from improperly parked vehicles or maintenance work, and provision of room for circulating traffic. Typically, more allowance is made for short-term parking areas because of the higher traffic flow. For the purpose of this analysis, LOS A assumes a 15% allowance in the hourly garage facility and a 10% allowance in all other parking facilities. LOS B assumes a 5% allowance in the hourly garage facility and a 3% allowance in all other parking areas.

Source: Unison-Maximus, Inc. Analysis

5.3.2 Historical Public Parking Demand

The historical trend in parking demand, measured in terms of vehicle exits, is presented in **Table 5.3-3**. Annual parking demand increased from 1.43 million vehicle exits in 1996 to 1.53 million in 2000, representing an average annual growth rate of 1.8 percent. However, the terrorist attacks of September 11, 2001 and the U.S. economic downturn, which began in March 2001 had a negative impact on parking activity and contributed to the 13.1 percent decrease in parking demand in 2001 compared to the level of demand in 2000. Over the 1996-2001 period, the Garage accommodated the largest share of vehicle exits, with a high percentage share of 91 percent reported in 1996. However, the percentage of vehicle exits reported in the Garage has been decreasing in recent

years. The security measures implemented following September 11, 2001 contributed to the observed shift in parkers away from the Garage. The heightened security measures, which do not allow non-passengers past security checkpoints in the passenger terminals, may have also contributed to the loss of business from meeters and greeters who would typically have parked in the short-term garage area.

TABLE 5.3-3
General Mitchell International Airport
HISTORICAL PUBLIC PARKING DEMAND - VEHICLE EXITS [1]

Year	O&D Enplanements	Vehicle Count - by facility			Total Vehicle Count	Vehicle/O&D Enplanement
		Garage[2]	Surface Lot	Remote Lot		
1996	2,526,272	1,303,389	80,415	43,105	1,426,909	0.56
1997	2,604,628	1,276,418	77,915	56,778	1,411,111	0.54
1998	2,586,652	1,270,694	87,049	75,414	1,433,157	0.55
1999	2,684,898	1,303,473	91,217	85,226	1,479,916	0.55
2000	2,805,444	1,337,828	103,645	91,580	1,533,053	0.55
2001	2,542,131	1,107,395	144,241	80,016	1,331,652	0.52
Average Annual Growth Rate						
1996-2001	0.1%	-3.2%	12.4%	13.2%	-1.4%	-

[1] Annual parking demand is measured in terms of vehicle exits.
[2] Garage includes hourly and daily garage facilities

Source: General Mitchell International Airport staff.

The demand for public parking comes primarily from the O&D passengers, which constituted approximately 90 percent of enplanements at the Airport in 2001. Table 5.3-3 also shows that the trend in parking demand at the Airport closely mirrored the trend in O&D enplanements during the 1996-2001 period. With the exception of 1998, annual increases in O&D enplanements resulted in an average annual growth rate of 2.7 percent between 1996 and 2000. However, the September 11, 2001 events contributed to the 9.4 percent decrease in O&D enplanements in 2001 compared to enplanements in 2000. During the 1996-2001 period, the ratio of vehicle exits per enplanement was stable, ranging between 0.52 and 0.56 vehicle exits per O&D enplanement. The ratio confirms the close correlation between O&D enplanements and parking demand at the Airport.

5.3.3 Projected Public Parking Demand

The projected public parking demand at the Airport is based on the projected annual O&D enplanements. For the purpose of the forecast, parking demand is defined in terms of peak parking occupancy, which is the highest number of parking spaces utilized at a given time. The annual peak occupancy in each parking facility indicates the number of spaces needed to satisfy parking requirements on the day with the most demand in that facility. The benchmark year is 2001.

It should be pointed out that in 2001, peak parking occupancy occurred in a different month for each of the parking facilities. Airport records show that in 2001, peak parking occupancy occurred in April for the Garage Hourly, in February for the Garage Daily, and March for the Surface Lot. For the Remote lots, peak parking occupancy in the Remote Lot A occurred in October, while in Remote Lot B, peak parking occupancy occurred in December.

The Airport also tracks the total number of parked vehicles in all parking facilities to record the peak parking demand for all public parking at the Airport. Airport records show that during the 1999-2001 period, the typical peak parking occupancy month for the entire Airport was March. The differences in the peak occupancy pattern between individual facilities and for the Airport as a whole mean that it is not valid to sum the peak parking occupancy observed in the individual facilities in 2001 to obtain an overall peak parking occupancy for the year. Consequently, the projection of public parking demand at the Airport was performed at two levels. The first level involves the projection of public parking demand in each individual facility, and the second level involves the overall public parking demand at the Airport, for all Airport public parking facilities considered in total.

Peak parking demand in each facility was compared to the O&D enplanements in 2001 and expressed as a parking demand ratio in terms of spaces per thousand O&D enplanements. The parking demand ratios ranged from 0.26

spaces per thousand O&D enplanements in the Surface Lot, to 2.05 spaces per thousand O&D enplanements in the Garage Daily. These ratios were then applied to the projected O&D enplanements to estimate the public parking demand in each facility in 2006, 2011, and 2021.

Table 5.3-4 summarizes the public parking demand ratio by facility for the year 2001 and the projected public parking demand by facility.

Parking demand in the Garage Hourly is projected to increase from 723 spaces in 2001 to 1,541 spaces by 2021. Parking demand is projected to reach 11,088 spaces in the Garage Daily by 2021. Parking demand in the Surface Lot is projected to increase to 1,430 spaces by 2021, while parking demand in Remote Lots A and B is projected to reach 3,414 spaces and 2,818 spaces, respectively, by 2021.

As mentioned earlier, peak parking occupancy in each of the facilities occurred in a different month in 2001. The Airport staff tracks a measure of peak parking occupancy that allows for an assessment of overall public parking supply adequacy for all parking facilities at the Airport as a whole. According to Airport records, the annual peak parking occupancy for all parking facilities in total occurred in March during the 1999-2001 period. An overall parking demand ratio was calculated based on the peak parking occupancy of 9,140 spaces reported in March 2001. The resulting ratio of 3.6 spaces per thousand O&D enplanements was applied to the projected annual O&D enplanements to obtain estimates of overall public parking demand for all parking facilities at the Airport for 2006, 2011 and 2021.

TABLE 5.3-4

General Mitchell International Airport

PROJECTED PUBLIC PARKING DEMAND
(BASED ON SPACES PER THOUSAND O&D ENPLANEMENTS) [1]

Parking Facility	Peak Parking Occupancy [2]	Parking Demand Ratio[3]	Projected Parking Demand [4]		
	2001		2006	2011	2021
Garage - Hourly	723	0.28	940	1,109	1,541
Garage - Daily	5,202	2.05	6,760	7,976	11,088
Surface Lot	671	0.26	872	1,029	1,430
Remote Lot A	1,611	0.63	2,094	2,470	3,434
Remote Lot B	1,322	0.52	1,718	2,027	2,818
O&D Enplanements [1]	2,542,131	N/A	3,303,607	3,897,637	5,418,562

[1] Based on PB Aviation, Inc. analysis. See Table 3.2-1

[2] Peak parking occupancy or peak demand is the highest number of parking spaces utilized at a given time. The annual peak occupancy in each facility occurred in different months in 2001, as follows:

Garage - Hourly: April
Garage - Daily: February
Surface Lot: March
Remote Lot A: October
Remote Lot B: December

Therefore, the individual peaks and parking demand ratios are not additive.

[3] Parking demand ratio expresses peak demand in each facility in 2001 in terms of space requirement per thousand O&D enplanements in 2001.

[4] Projected parking demand for each facility is calculated as the parking demand ratio for each facility times the projected annual O&D enplanements.

Source: The parking supply and peak occupancy data were obtained from the Airport.

The results presented in **Table 5.3-5** project an increase in total parking demand from 9,140 spaces in 2001 to 19,482 spaces by 2021.

As mentioned previously, the differences in the peak demand pattern means that it is not valid to sum the peak demand in each facility to obtain an overall peak demand for the year. Consequently, the assessment of public parking requirements at the Airport was performed at two levels. The first level examines public parking requirements in each facility, and the second level examines the overall public parking requirements at the Airport. Consistent with the distinction between actual and effective public parking supply, the assessment of public parking requirements was performed with respect to actual public parking supply and parking supply under LOS A and LOS B.

TABLE 5.3-5

General Mitchell International Airport

PROJECTED TOTAL PUBLIC PARKING DEMAND
(BASED ON SPACES PER THOUSAND O&D ENPLANEMENTS)

	2001	2006	2011	2021
O&D Enplanements [1]	2,542,131	3,303,607	3,897,637	5,418,562
Annual Peak Parking Occupancy [2]				
All Facilities	9,140			
Overall Parking Demand Ratio (Spaces/'000 O&D EP) [3]				
All Facilities	3.60	3.60	3.60	3.60
Projected Total Parking Demand – Number of Spaces (Based on 2001 Parking Demand Ratio)				
All Facilities	9,140	11,878	14,014	19,482

[1] Based on PB Aviation, Inc. analysis. See Table 3.2-1.
[2] Peak parking occupancy or peak demand is the highest number of parking spaces utilized at a given time. Annual peak occupancy occurred in March during the 1999-2001 period.
[3] Parking demand ratio expresses overall peak demand in 2001 in terms of space requirement per thousand O&D enplanements in 2001.
Source: The parking supply and peak occupancy data were obtained from the Airport.

The results presented in **Table 5.3-6** indicate that actual parking supply will remain adequate in the Garage Hourly through 2011, but a shortage of 289 spaces is projected in the facility by 2021. Actual parking supply in the Garage Daily will be adequate though 2006, but a shortage of 662 spaces is projected by 2011, which will increase to 3,774 spaces by 2021. Parking shortages are projected in the Surface Lot, and in Remote Lots A and B by 2006 through 2021. For example, a shortage of 297 spaces is projected in the Surface Lot by 2006, and the shortage will reach 855 spaces by 2021.

Table 5.3-7 involves the same comparison of projected parking demand and planned supply, with the assumption that the Airport's goal is to provide the level of service implied by LOS A. Under LOS A, parking shortages are projected in all facilities at each of the planning level, with the exception of the Garage Hourly in 2006. **Table 5.3-8** shows that the situation will improve somewhat if the Airport were to lower the acceptable level of service to LOS B. Under LOS B, the magnitudes of the shortages are lower than they are under LOS A, and parking supply in the Garage Hourly is projected to be adequate through 2011.

TABLE 5.3-6

General Mitchell International Airport

PUBLIC PARKING REQUIREMENTS - ACTUAL

	2001	2006	2011	2021
O&D Enplanements[1]	2,542,131	3,303,607	3,897,637	5,418,562
Actual Public Parking Supply[2]				
Garage – Hourly	723	1,252	1,252	1,252
Garage – Daily (includes New Garage Phase 1)	5,202	7,314	7,314	7,314
Surface Lot	691	575	575	575
Remote Lot A	1,611	1,836	1,836	1,836
Remote Lot B	1,326	1,184	1,184	1,184
2001 Parking Demand Ratios (Spaces/'000 O&D EP)[3]				
Garage – Hourly	0.28	0.28	0.28	0.28
Garage – Daily (includes New Garage Phase 1)	2.05	2.05	2.05	2.05
Surface Lot	0.26	0.26	0.26	0.26
Remote Lot A	0.63	0.63	0.63	0.63
Remote Lot B	0.52	0.52	0.52	0.52
Projected Parking Demand – Number of Spaces[3] (Based on 2001 Parking Demand Ratios)				
Garage – Hourly	723	940	1,109	1,541
Garage – Daily (includes New Garage Phase 1)	5,202	6,760	7,976	11,088
Surface Lot	671	872	1,029	1,430
Remote Lot A	1,611	2,094	2,470	3,434
Remote Lot B	1,322	1,718	2,027	2,818
Actual Supply Adequacy – Surplus (Shortage)				
Garage – Hourly	0	312	143	(289)
Garage – Daily (includes New Garage Phase 1)	0	554	(662)	(3,774)
Surface Lot	20	(297)	(454)	(855)
Remote Lot A	0	(258)	(634)	(1,598)
Remote Lot B	4	(534)	(843)	(1,634)

[1] Based on PB Aviation, Inc. analysis. See Table 3.2-1.
[2] See Table 5.3-2.
[3] See Table 5.3-4.

Source: The data for 2001 were obtained from the Airport. The projected parking supply adequacy was based on Unison-Maximus, Inc. analysis.

TABLE 5.3-7

General Mitchell International Airport

PUBLIC PARKING REQUIREMENTS – LOS A

	2001	2006	2011	2021
O&D Enplanements[1]	2,542,131	3,303,607	3,897,637	5,418,562
Effective Public Parking Supply – LOS A[2]				
Garage – Hourly	615	1,064	1,064	1,064
Garage – Daily (includes New Garage Phase 1)	4,682	6,583	6,583	6,583
Surface Lot	622	518	518	518
Remote Lot A	1,450	1,652	1,652	1,652
Remote Lot B	1,193	1,066	1,066	1,066
2001 Parking Demand Ratios (Spaces/'000 O&D EP)[3]				
Garage – Hourly	0.28	0.28	0.28	0.28
Garage – Daily (includes New Garage Phase 1)	2.05	2.05	2.05	2.05
Surface Lot	0.26	0.26	0.26	0.26
Remote Lot A	0.63	0.63	0.63	0.63
Remote Lot B	0.52	0.52	0.52	0.52
Projected Parking Demand – Number of Spaces[3] (Based on 2001 Parking Demand Ratios)				
Garage – Hourly	723	940	1,109	1,541
Garage – Daily (includes New Garage Phase 1)	5,202	6,760	7,976	11,088
Surface Lot	671	872	1,029	1,430
Remote Lot A	1,611	2,094	2,470	3,434
Remote Lot B	1,322	1,718	2,027	2,818
LOS A Effective Supply Adequacy - Surplus (Shortage)				
Garage – Hourly	(108)	125	(44)	(477)
Garage – Daily (includes New Garage Phase 1)	(520)	(178)	(1,393)	(4,505)
Surface Lot	(49)	(354)	(511)	(913)
Remote Lot A	(161)	(441)	(818)	(1,781)
Remote Lot B	(129)	(652)	(961)	(1,752)

[1] Based on PB Aviation, Inc. analysis. See Table 3.2-1.
[2] See Table 5.3-2.
[3] See Table 5.3-4.

Source: The data for 2001 were obtained from the Airport. The projected parking supply adequacy was based on Unison-Maximus, Inc. analysis.

TABLE 5.3-8

General Mitchell International Airport

PUBLIC PARKING REQUIREMENTS – LOS B

	2001	2006	2011	2021
O&D Enplanements[1]	2,542,131	3,303,607	3,897,637	5,418,562
Effective Public Parking Supply – LOS B[2]				
Garage – Hourly	687	1,189	1,189	1,189
Garage – Daily (includes New Garage Phase 1)	5,046	7,095	7,095	7,095
Surface Lot	670	558	558	558
Remote Lot A	1,563	1,781	1,781	1,781
Remote Lot B	1,286	1,148	1,148	1,148
2001 Parking Demand Ratios (Spaces/'000 O&D EP)[3]				
Garage – Hourly	0.28	0.28	0.28	0.28
Garage – Daily (includes New Garage Phase 1)	2.05	2.05	2.05	2.05
Surface Lot	0.26	0.26	0.26	0.26
Remote Lot A	0.63	0.63	0.63	0.63
Remote Lot B	0.52	0.52	0.52	0.52
Projected Parking Demand – Number of Spaces[3] (Based on 2001 Parking Demand Ratios)				
Garage – Hourly	723	940	1,109	1,541
Garage – Daily (includes New Garage Phase 1)	5,202	6,760	7,976	11,088
Surface Lot	671	872	1,029	1,430
Remote Lot A	1,611	2,094	2,470	3,434
Remote Lot B	1,322	1,718	2,027	2,818
LOS B Effective Supply Adequacy - Surplus (Shortage)				
Garage – Hourly	(36)	250	81	(352)
Garage – Daily (includes New Garage Phase 1)	(156)	334	(881)	(3,994)
Surface Lot	(1)	(314)	(471)	(872)
Remote Lot A	(48)	(313)	(689)	(1,653)
Remote Lot B	(36)	(570)	(878)	(1,669)

[1] Based on PB Aviation, Inc. analysis. See Table 3.2-1.
[2] See Table 5.3-2.
[3] See Table 5.3-4.

Source: The data for 2001 were obtained from the Airport. The projected parking supply adequacy was based on Unison-Maximus, Inc. analysis.

The results of the assessment of overall parking requirements presented in **Table 5.3-9** indicate that actual parking supply will be adequate to meet the projected parking demand through 2006. However, a shortage of 1,853 spaces is projected by 2011, which will increase to 7,321 spaces by 2021. When defined in terms of effective parking supply, shortages are projected by 2006 through 2021 under both LOS A and LOS B. For example, under LOS A, a parking shortage of 8,600 spaces is projected by 2021, while under LOS B, a parking shortage of 7,711 spaces is projected by 2021. The analysis of overall parking requirements assumes that when a parker cannot find a space in one facility, that parker will go to another on-Airport parking facility. The projected shortages in overall parking demand do not take into account potential shortages in the individual facilities.

TABLE 5.3-9

General Mitchell International Airport

TOTAL PUBLIC PARKING REQUIREMENTS

	2001	2006	2011	2021
O&D Enplanements[1]	2,542,131	3,303,607	3,897,637	5,418,562
Actual Public Parking Supply[2]				
All Facilities	9,553	12,161	12,161	12,161
Effective Public Parking Supply-LOS B[2]				
All Facilities	8,562	10,882	10,882	10,882
Effective Public Parking Supply-LOS A[2]				
All Facilities	9,252	11,771	11,771	11,771
2001 Parking Demand Ratio (Spaces/'000 O&D EP)[3]				
Parking Demand Ratio	3.60	3.60	3.60	3.60
Projected Parking Demand – Number of Spaces[3] (Based on 2001 Parking Demand Ratio)				
All Facilities	9,140	11,878	14,014	19,482
Actual Supply Adequacy – Surplus (Shortage)	413	283	(1,853)	(7,321)
LOS A Supply Adequacy – Surplus (Shortage)	(690)	(996)	(3,131)	(8,600)
LOS B Supply Adequacy – Surplus (Shortage)	112	(107)	(2,242)	(7,711)

[1] Based on PB Aviation, Inc. analysis. See Table 3.2-1.
[2] See Table 5.3-2.
[3] See Table 5.3-5.

Source: The data for 2001 were obtained from the Airport. The projected parking supply adequacy was based on Unison-Maximus, Inc. analysis.

5.3.4 Projected Non-Public Parking Demand

The non-public parking spaces are allocated to Airport and tenant employees, rental car companies, taxi staging area, limousine staging area, and delivery vehicle parking. The projection of parking demand by each category of non-public parkers follows a similar methodology as the one used for the projection of public parking demand presented above. The benchmark year is 2001.

5.3.4.1 Projected Employee Parking Demand

In 2001, the Airport provided 1,503 employee parking spaces. Of these, 1,058 spaces are located in the employee parking lot close to the terminal building, while the remaining 445 spaces are located in a designated portion of Remote Lot B. Based on vehicle count by the Airport, peak employee parking occupancy in 2001 was 1,250 spaces or 83 percent of capacity. The projected employee parking demand is based on the projected annual enplanements developed by PB Aviation, Inc. The peak employee parking occupancy in 2001 was expressed as a parking demand ratio in terms of spaces per thousand enplanements in

2001. The resulting parking demand ratio of 0.44 was applied to the projected enplanements to estimate the employee parking demand in 2006, 2011, and 2021. The results presented in **Table 5.3-10** project an increase in employee parking demand from 1,250 spaces in 2001 to 2,857 spaces by 2021.

TABLE 5.3-10

General Mitchell International Airport

PROJECTED EMPLOYEE PARKING DEMAND
(BASED ON SPACES PER THOUSAND ENPLANEMENTS)

	2001	2006	2011	2021
Enplanements[1]	2,811,954	3,658,480	4,434,172	6,427,713
Employee Parking Demand Ratio (Spaces/'000 EP)[2]	0.44	0.44	0.44	0.44
Employee Parking Supply[3]	1,503	1,503	1,503	1,503
Projected Employee Parking Demand[4]	1,250	1,626	1,971	2,857
Employee Parking Adequacy – Surplus (Shortage)	253	(123)	(468)	(1,354)

[1] Based on PB Aviation, Inc. analysis. See Table 3.2-1.
[2] Based on vehicle count obtained from the Airport.
[3] See Table 5.3-1.
[3] Based on the 2001 employee parking demand ratio of 0.44 spaces per thousand enplanements.

Source: Unison-Maximus, Inc. analysis

The assessment of employee parking requirements presented in Table 5.3-10 projects a shortage in employee parking of 123 spaces by 2006, which will increase to a shortage of 1,354 spaces by 2021.

5.3.4.2 Projected Rental Car Parking Demand

The Airport is currently served by seven rental car companies: Alamo, Avis, Budget, Dollar, Enterprise, Hertz, and National. In 2001, the rental car companies had use of 400 spaces in the garage. However, the rental car companies indicated to Airport management that the supply was inadequate. In response, the Airport increased the supply of spaces to 950, effective January 2003. The projected rental car parking demand is based on the projected annual O&D enplanements developed by PB Aviation, Inc. For the purpose of this analysis, the current parking supply of 950 ready car spaces was considered the best approximation of peak parking demand by the rental car companies in 2001 and was used to calculate the rental car parking demand ratio. The resulting parking demand ratio of 0.37 spaces per thousand O&D enplanements was applied to the projected enplanements to estimate the rental car parking demand in 2006, 2011, and 2021. The results presented in **Table 5.3-11** project an increase in rental car parking demand from 950 spaces in 2001 to 2,025 spaces by 2021.

TABLE 5.3-11

General Mitchell International Airport

PROJECTED RENTAL CAR PARKING DEMAND
(BASED ON SPACES PER THOUSAND ENPLANEMENTS)

	2001	2006	2011	2021
O&D Enplanements[1]	2,542,131	3,303,607	3,897,637	5,418,562
Rental Car Parking Demand Ratio (Spaces/'000 EP)[2]	0.37	0.37	0.37	0.37
Rental Car Parking Supply (ready car spaces)[3]	950	950	950	950
Projected Rental Car Parking Demand[4]	950	1,235	1,457	2,025
Rental Car Parking Adequacy – Surplus (Shortage)	0	(285)	(507)	(1,075)

[1] Based on PB Aviation, Inc. analysis. See Table 3.2-1.
[2] Based on information obtained from the Airport. The actual number of spaces available in 2001 was 400. However, the rental car companies indicated to Airport management that the supply was inadequate. In response, the Airport increased the supply to 950 spaces, effective January 2003. For the purpose of this analysis, the current supply of 950 spaces is considered the best approximation available for peak occupancy.
[3] Based on the 2001 rental car parking demand ratio of 0.34 spaces per thousand enplanements.

Source: Unison-Maximus, Inc. analysis

The assessment of rental car parking requirements presented in Table 5.3-11 projects a shortage in rental car parking of 285 spaces by 2006, which will increase to a shortage of 1,075 spaces by 2021.

5.3.4.3 Projected Taxi Storage Demand

The Airport is currently served by approximately 56 taxicab operators. In 2001, the Airport assigned 40 spaces as taxi staging area. The projected taxi storage demand is based on the projected annual O&D peak enplanements developed by PB Aviation, Inc. For the purpose of this analysis, it was assumed that all available taxi storage spaces are occupied during peak passenger hour. Consequently, it was assumed that the current parking supply of 40 spaces is a reasonable approximation of peak parking demand by the taxicab operators in 2001 and was used to calculate the taxi parking demand ratio in 2001. The resulting parking demand ratio of 0.0048 spaces per peak O&D enplanement was applied to the projected annual peak enplanements to estimate the taxicab storage demand in 2006, 2011, and 2021. The results presented in **Table 5.3-12**, project an increase in taxi storage demand from 40 spaces in 2001 to 82 spaces by 2021.

The assessment of taxi staging area requirements presented in Table 5.3-12 projects a shortage in taxicab staging area of ten spaces by 2006, which will increase to a shortage of 42 spaces by 2021.

TABLE 5.3-12

General Mitchell International Airport

PROJECTED TAXI STORAGE DEMAND
(BASED ON SPACES PER ANNUAL PEAK ENPLANEMENTS)

	2001	2006	2011	2021
Peak O&D Enplanements – Average Day in March[1]	8,272	10,315	12,172	16,906
Taxi Storage Demand Ratio (Spaces/Annual Peak EP)[2]	0.0048	0.0048	0.0048	0.0048
Taxi Storage[3]	40	40	40	40
Projected Taxi Storage Demand[4]	40	50	54	82
Taxi Storage Adequacy – Surplus (Shortage)	0	(10)	(19)	(42)

[1] March is the typical peak passenger month on GMIA. The peak enplanement figure in 2001 was estimated by dividing the March 2001 O&D enplanements by 31. The projected peak enplanements were obtained from PB Aviation, Inc. analysis.
[2] Peak taxi storage assumes that all available taxi staging areas are occupied during peak passenger hour.
[3] See Table 5.3-1.
[3] Based on the 2001 taxi storage demand ratio of 0.0048 spaces per peak enplanement.

Source: Unison-Maximus, Inc. analysis

5.3.4.4 Projected Limousine Storage Demand

In 2001, the Airport assigned 23 spaces as limousine staging area. Limousine service at the Airport is usually by reservation, meaning that the limousine operator would be at the Airport only if a customer had made prior arrangement. The projected limousine storage demand is based on the projected annual peak O&D enplanements developed by PB Aviation, Inc. For the purpose of this analysis, it was assumed that all available limousine storage spaces are occupied during peak passenger hour. Consequently, it was assumed that the current parking supply of 23 spaces is a reasonable approximation of peak parking demand by the limousine operators in 2001 and was used to calculate the limousine parking demand ratio in 2001. The resulting parking demand ratio of 0.0028 spaces per peak O&D enplanements was applied to the projected annual peak enplanements to estimate the limousine storage demand in 2006, 2011, and 2021. The results presented in **Table 5.3-13**, project an increase in limousine storage demand from 23 spaces in 2001 to 48 spaces by 2021.

The assessment of limousine staging area requirements presented in Table 5.3-13 projects a shortage in limousine staging area of six spaces by 2006, which will increase to a shortage of 25 spaces by 2021.

TABLE 5.3-13

General Mitchell International Airport

PROJECTED LIMOUSINE STORAGE DEMAND
(BASED ON SPACES PER ANNUAL PEAK ENPLANEMENTS)

	2001	2006	2011	2021
Peak O&D Enplanements – Average Day in March[1]	8,272	10,315	12,172	16,906
Limousine Storage Demand Ratio (Spaces/Annual Peak EP)[2]	0.0028	0.0028	0.0028	0.0028
Limousine Storage[3]	23	23	23	23
Projected Limousine Storage Demand[4]	23	29	35	48
Limousine Storage Adequacy – Surplus (Shortage)	0	(6)	(12)	(25)

[1] March is the typical peak passenger month at GMIA. The peak O&D enplanement figure in 2001 was estimated by dividing the March 2001 O&D enplanements by 31. The projected peak enplanements were obtained from PB Aviation, Inc. analysis. See Table 3.5-1.
[2] Limousine storage demand ratio calculated as the 2001 limousine storage demand (in terms of number of spaces) per peak enplanement in 2001.
[3] See Table 5.3-1.
[4] Based on the 2001 limousine storage demand ratio of 0.0028 spaces per peak enplanement.

Source: Unison-Maximus, Inc. analysis

5.3.4.5 Projected Delivery Vehicle Parking Demand

In 2001, 20 spaces were designated for use by various delivery services at the Airport. The projected delivery parking demand is based on the projected annual peak enplanements developed by PB Aviation, Inc. For the purpose of this analysis, it was assumed that all available delivery vehicle parking spaces are occupied during peak delivery period, which is assumed to coincide with peak passenger hour. Consequently, it was assumed that the current parking supply of 20 spaces is a reasonable approximation of peak parking demand by the delivery services in 2001 and was used to calculate the delivery vehicle parking demand ratio in 2001. The resulting parking demand ratio of 0.0022 spaces per peak enplanements was applied to the projected annual peak enplanements to estimate the delivery vehicle parking demand in 2006, 2011 and 2021. The results presented in **Table 5.3-14**, project an increase in delivery vehicle parking demand from 20 spaces in 2001 to 44 spaces by 2021.

The assessment of delivery vehicle parking requirements presented in Table 5.3-14 projects a shortage in delivery vehicle parking of five spaces by 2006, which will increase to a shortage of 24 spaces by 2021.

TABLE 5.3-14

General Mitchell International Airport

PROJECTED DELIVERY VEHICLE PARKING DEMAND
(BASED ON SPACES PER ANNUAL PEAK ENPLANEMENTS)

	2001	2006	2011	2021
Peak Enplanements – Average Day in March[1]	9,151	11,419	13,840	20,063
Delivery Vehicle Demand Ratio (Spaces/Annual Peak EP)[2]	0.0022	0.0022	0.0022	0.0022
Peak Delivery Vehicle Parking Occupancy[3]	20	20	20	20
Projected Delivery Vehicle Parking Demand[4]	20	25	30	44
Delivery Vehicle Parking Adequacy – Surplus (Shortage)	0	(5)	(10)	(24)

[1] March is the typical peak passenger month at GMIA. The peak enplanement figure in 2001 was estimated by dividing the March 2001 total enplanements of 283,690 by 31. The projected peak enplanements were obtained from PB Aviation, Inc. analysis. See Table 3.5-1.
[2] Delivery vehicle demand ratio calculated as the 2001 delivery vehicle parking demand (in terms of number of spaces) per peak enplanement in 2001.
[3] Peak delivery parking occupancy assumes that all available delivery vehicle parking spaces are occupied during peak passenger hour.
[4] Based on the 2001 vehicle parking demand ratio of 0.0022 spaces per peak enplanement.

Source: Unison-Maximus, Inc. analysis

5.3.5 Other Factors That Could Affect Parking Demand

There are factors that could affect Airport parking that may not be within the immediate control of the Airport management. Examples of such factors include:

- ***Off-airport Parking.*** Parking customers, like most consumers, may shop around for alternatives to parking at the Airport. Off-airport parking facilities may represent an option for daily and long-term parkers if, among other things, the parking rates and service are attractive. There are five off-airport parking lots within a one-mile radius from the Airport with parking rates ranging from $5.00 to $7.00 per day and complimentary shuttle service 24 hours a day. The Quality Inn Hotel, which is 0.2 miles from the Airport, provides 400 parking spaces. Allright Parking and Exec-Park Valet are also close to the Airport (0.3 miles away), with 1,260 and 150 parking spaces, respectively. Slightly farther from the Airport (0.8 miles away) but most competitively priced with a daily rate of $5.00 is Economy Airport Parking with 580 parking spaces. Thrifty Parking is the farthest from the Airport with a daily rate of $5.00.

- ***Public Transportation***. The Milwaukee County Transit System (MCTS) operates a daily bus route (Route 80) with a stop at the Airport. According to the published MCTS bus schedule, current weekday service leaves the Airport once hourly, with higher frequency service provided on Saturdays. The bus ride from downtown Milwaukee to the Airport takes approximately 33 minutes. However, the Route 80 bus serves mostly Airport employees and very few air travelers. The reasons given for the

low ridership among air passengers include inconvenience and travel time. Public transportation service is therefore unlikely to have a significant impact on parking demand at the Airport.

- Additional private sector limousine/shuttle services. The Airport Connection provides limousine and van services to and from the Airport. The limousine or executive car service uses Lincoln Town Cars, while the van service uses eleven-seat passenger vans. The primary advantage of both services is that they are door-to-door. Of the two services, the share-ride shuttle service is more economical in terms of monetary cost. However, the cost advantage of shuttle service must be weighed against the potentially higher time cost involving waiting time and additional drop-off time when multiple destination passengers share a ride.

5.4 AIR CARGO REQUIREMENTS

The projection of enplaned freight, air mail and express mail indicates that cargo will increase from 108 million pounds in 2001 to 188 million pounds in 2021. This section analyzes future air cargo building and apron requirements that support operations by the integrated carriers (FedEx, UPS, etc.), freight forwarders and the passenger airlines.

Future facility requirements are based upon a combination of individual industry standards, utilization rates at the Airport, and air cargo tonnage projections. These utilization rates have been increasing recently, as most of the integrated cargo carriers utilize the airport cargo facilities for ground transportation in addition to air cargo. For the purpose of determining air cargo building requirements at the Airport, a rate of 3.0 square feet per annual enplaned ton is used. Using this requirement, the Airport will need an estimated 257,000 square feet of air cargo building facilities by the end of the planning period. The Airport currently has approximately 164,000 square feet of air cargo facilities. Therefore, an additional 93,000 square feet of air cargo facilities will be required. **Table 5.4-1** presents future building requirements through the planning period.

Air cargo apron space is also required in conjunction with the air cargo buildings. This space includes aircraft parking, as well as container and support equipment storage. There are approximately 63,300 square yards of existing air cargo apron. Based upon observations and inventory, the existing air cargo apron operates near or at capacity.

Future apron requirements were based on the number of cargo operations and future fleet mix that will occupy the apron. As indicated in Table 5.4-1, by the end of the planning period, approximately 32,100 square yards of air cargo apron will be required over what is in place today.

TABLE 5.4-1

General Mitchell International Airport

AIR CARGO SPACE REQUIREMENTS

	2002	2006	2011	2021
Annual Enplaned Air Cargo	49,046	52,365	60,280	85,689
Air Cargo Building Space Required (sf)	147,000	157,000	181,000	257,000
Air Cargo Building Surplus/(Deficit) (sf)	17,000	7,000	(17,000)	(93,000)
Air Cargo Apron Space Required (sy)	63,300	67,400	76,100	95,400
Air Cargo Apron Surplus/(Deficit) (sy)	-	(4,100)	(12,800)	(32,100)

Source: PB Aviation, Inc. Analysis

5.5 GENERAL AVIATION REQUIREMENTS

General aviation requirements were developed for the Airport based on the activity projection for this segment of Airport activity. Facility needs were estimated for the following functional areas:

- *Itinerant and based aircraft apron*
- *Fixed-base operator (FBO) Terminal Space*
- *Corporate Hangars*

5.5.1 Itinerant and Based Aircraft Apron

An apron for aircraft parking is required for passenger loading and unloading of visiting aircraft using the FBO terminal. Additional apron space is used for parking aircraft based at the Airport that are not stored in hangars.

Future general aviation (GA) parking apron requirements were based on the peak hour itinerant aircraft projections and the corresponding aircraft apron space required. **Table 5.5-1** shows apron requirements throughout the planning period. As presented, it is anticipated that the existing GA parking apron will meet the requirements through the planning period.

TABLE 5.5-1

General Mitchell International Airport

GENERAL AVIATION FACILITY REQUIREMENTS

	2002	2006	2011	2021
Peak Hour General Aviation Operations	10	10	11	12
Total General Aviation Apron Required (sy)	18,200	18,200	20,020	21,840
Aircraft Parking Apron Surplus/(Deficit) (sy)	7,800	7,800	5,980	4,160
GA Terminal/Administration Space (sf)	4,500	4,500	4,950	5,400
GA Terminal/Administration Surplus/(Deficit) (sf)	1,950	1,950	1,500	1,050

Source: PB Aviation, Inc. Analysis

5.5.2 FBO Terminal Space

The existing FBO terminal and administration building is approximately 6,400 square feet in size and is adjacent to the FBO hangars. Discussions with FBO management indicate that the terminal and administration building operate at 70 percent capacity.

Future terminal and administration building space was projected based on the peak day itinerant aircraft projections (as described in the previous section). Table 5.5-1 also presents space requirements through the planning period. Throughout the planning period, there is a projected surplus of FBO terminal and administration space.

5.5.3 Corporate Hangars

The Airport currently leases space for nine corporate hangars in addition to the smaller general aviation hangar space in the Northeast hangar area. The projections indicate a shift within the GA fleet mix with a greater proportion of turboprop and turbojet activity and less single-engine and light twin-engine activity (see Chapter 3.0*, Activity Projections*, Table 3.4-6). Therefore, the future demand for small hangar space will be limited and there will be a greater demand for hangar space for turboprop and turbojet aircraft typically used by corporate flight departments.

In the alternatives development phase of the Master Plan Update, space should be reserved for three to four additional corporate hangars in addition to space for relocation of existing corporate hangars that may be displaced by expansion of other Airport facilities.

5.6 SUPPORT FACILITY REQUIREMENTS

Support facility requirements enable normal operation and services of the Airport to go uninterrupted. It is therefore important to assess whether these facilities are capable and suited to perform their respective activities, especially in case of emergency. The supporting facilities that are examined in this section are as follows:

- *Airport Rescue and Firefighting (ARFF)*
- *Airport Maintenance*
- *Fuel Storage Facilities*

5.6.1 Airport Rescue and Firefighting (ARFF)

The Airport Rescue and Firefighting Facilities (ARFF) requirements are outlined in Federal Aviation Regulation (FAR) Part 139 Subpart D – Operations. These criteria were set forth by the FAA and ICAO Rescue and Firefighting Panel

(RFFP II), which conducted studies that identified the practical as well as theoretical fire areas of an aircraft and the corresponding amounts of extinguishing agents required to extinguish the fires. These data led to the development of an "Index" of five airport classes and the corresponding ARFF equipment requirements (**Table 5.6-1**). The applicable airport index is determined by the length of the longest aircraft operated by a passenger air carrier an average of five scheduled departures per day (compiled on an annual basis).

TABLE 5.6-1

General Mitchell International Airport

MINIMUM ARFF REQUIREMENTS UNDER FAR PART 139

Airport Category	Type Aircraft	Vehicle	Extinguishing Agent
Index A	Less than 90'	One lightweight	500 pounds of dry chemical or 450 pounds of dry chemical and 50 gallons of water for foam production.
Index B	More than 90' but less than 126'	One lightweight and one self-propelled fire extinguishing vehicle	Same dry chemical requirements as Index A and 1,500 gallons of water for foam production.
Index C	More than 126' but less than 160'	One lightweight and two self-propelled fire extinguishing vehicles	Same dry chemical requirements as Index A and 3,000 gallons of water for foam production.
Index D	More than 160' but less than 200'	Same as Index C	Same dry chemical requirements as Index A and 4,000 gallons of water for foam production.
Index E	More than 200'	Same as Index C	Same dry chemical requirements as Index A and 6,000 gallons of water for foam production.

Source: FAR Part 139

The Airport currently has an ARFF index of C with additional equipment available upon request through the Air Force Reserve and Wisconsin Air National Guard to meet Index D. The longest passenger aircraft projected at the Airport having an average of at least five daily scheduled departures is the MD-80 series. The MD-80 has a maximum length of 147.9 feet, placing it in the Index C category. For Index C the ARFF requirement as stated in Table 5.6-1 is one lightweight vehicle and two self-propelled fire extinguishing vehicles. Added to the fire fighting vehicles is an extinguishing agent requirement of 450 to 500 pounds of dry chemical and 3,000 gallons of water for foam production.

The service requirements of FAR Part 139 also specify that at least one firefighting vehicle be capable of reaching the midpoint of the farthest runway from its assigned post, or reaching any other specified point of comparable distance in the movement area which is available to air carriers, and applying extinguishing agent within three minutes from the time of alarm. Within four minutes from the time of alarm, all other required vehicles must reach the above point and begin application of extinguishing agent. The Airport's existing ARFF station is located so that response times to the midpoint of all existing runways are within allowable limits. The location of the existing station would provide the required coverage with its proximity to the C-1 Runway as well. Therefore no additional ARFF facilities are required during the 20-year planning period.

5.6.2 Airport Maintenance

The Airport's maintenance facilities are located south of Runway 7R/25L and include maintenance shops, equipment storage, and facilities shared with the County's road department. Information provided on airport maintenance buildings in FAA Advisory Circular 150/5220-18, *Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*, indicates that maintenance facility needs are related to pavement area, which in turn is related to aircraft operations.

The existing maintenance complex encompasses approximately 27 acres. Based on the increase in pavement area with the C-1 Runway and runway extensions, the Airport's maintenance complex will require approximately 37 acres. This requirement relates directly to the timing of the C-1 Runway.

5.6.3 Fuel Storage Facilities

Currently, jet fuel is transported by pipeline to a privately owned receiving and storage facility south of the Airport on College Avenue. Fuel moves from the pipeline into the 100,000 barrel tank, through a filtration system into a 20,000 barrel tank from which it enters the Airport's hydrant fueling system.

The Airport has initiated a design study for new fuel receiving and storage facilities. Results of this study indicate a need for upgraded storage and filtration. Alternatives for meeting this need include a combination of receiving and distribution tanks with a total capacity of 160,000 barrels. As depicted in **Exhibit 5.6-1**, the site identified for such a facility is 8.8 acres on the east side of the airport. Fuel delivery would be provided by an existing transfer pipeline in the vicinity.

5.7 SUMMARY OF FACILITY REQUIREMENTS

The facility requirements presented in this chapter form the basis for the next phase of the master plan. Alternatives to meet the projected demand for each of the functional areas will be developed and undergo preliminary screening based on the visions outlined in Chapter 1.0. The following is a summary of key landside facility requirements:

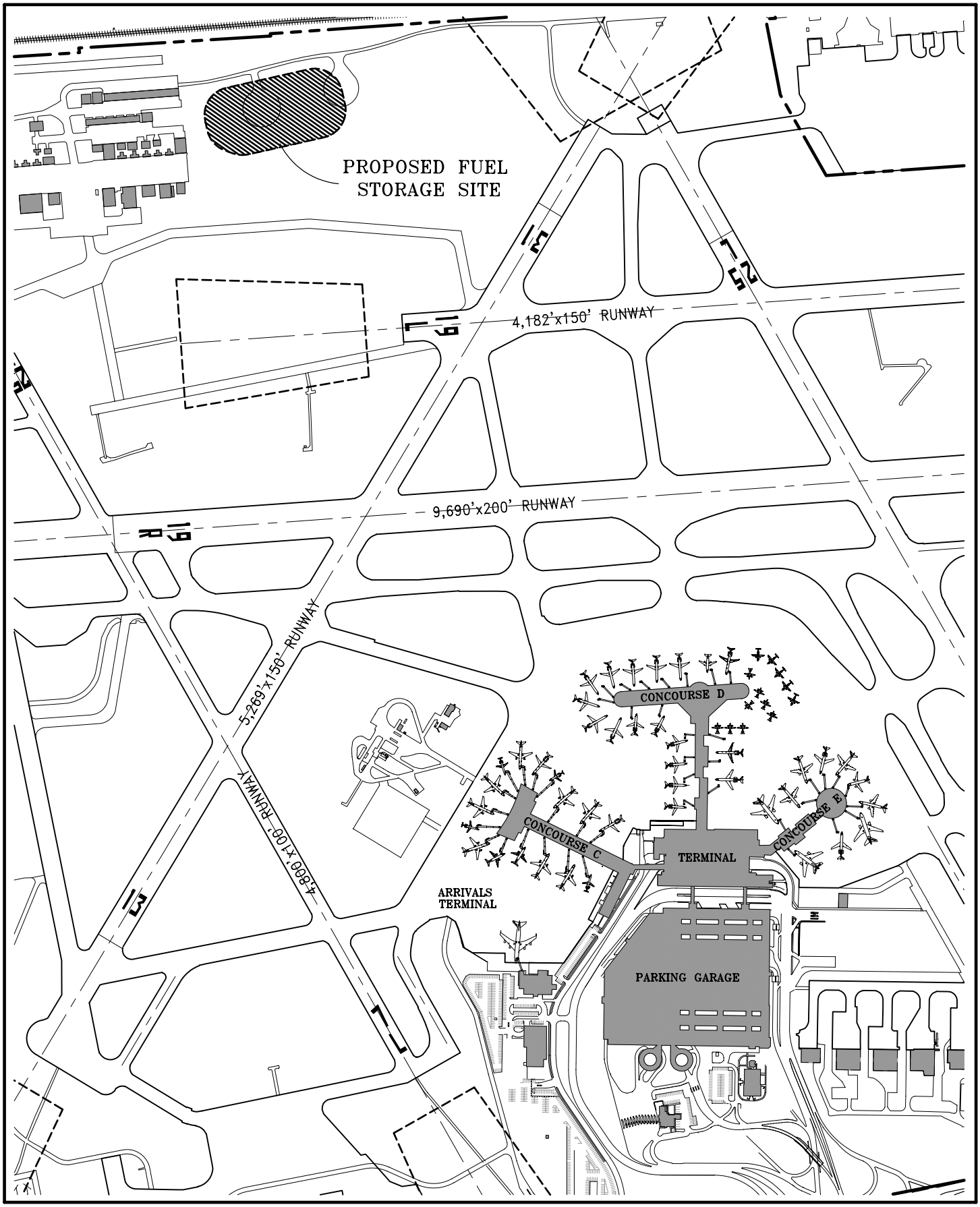
- As presented in detail, the terminal will require additional space through the planning period. The total terminal area requirement for 2020 is 1,288,000 square feet compared to the existing terminal that comprises 731,000 square feet.

- Although the Airport Spur is projected to have sufficient capacity through the planning period, congestion on Howell Avenue and ramps to and from the Airport terminal loop needs to be addressed in the development of alternatives.

- By 2020, approximately 19,482 public parking spaces, or 8,600 more than the existing number of spaces, are required to meet parking demand at LOS A. Additional parking will also be required for rental car and employee parking as well as additional taxi and limousine staging.

- An additional 93,000 square feet of cargo building space and 32,100 square yards of aircraft apron will be required through the planning period.

- The existing ARFF facility meets response time and equipment requirements and, based on the projected aircraft fleet, will continue to meet the requirements through the planning period.



GENERAL MITCHELL INTERNATIONAL AIRPORT
MASTER PLAN UPDATE

Proposed Fuel Storage Location

EXHIBIT
5.6-1

Milwaukee\Exhibits\fuel-storage.dwg 8/19/2003

PB AVIATION, INC.

- The Airport maintenance complex will require additional space commensurate with implementation of the runway extensions and C-1 runway.