Chapter 3 – Demand / Capacity

3.1 INTRODUCTION

It is through an analysis of airport demand and capacity that the planning of future facilities evolves, identifying the strengths and deficiencies in airport infrastructure, which are then considered when determining the airport's facility requirements. The demand-capacity analysis focuses on airside and landside facilities (i.e. runways, taxiways, apron space, auto parking, terminal building, and utilities), airspace (as related to capacity and delay), and land use. The purpose of this section is to present existing as well as forecast levels of aviation demand, which are compared with the capacity of the existing facilities. Any deficiencies that are identified will serve as the basis for recommended future improvements. The facilities or improvements necessary for the airport to accommodate forecast levels of aviation activity while avoiding capacity or delay problems are discussed in Chapter 4. The following discussion defines demand vs. capacity, gives the methodology that was followed in preparing the demand / capacity analysis, and provides the results of that analysis.

3.2 DEMAND, CAPACITY AND DELAY

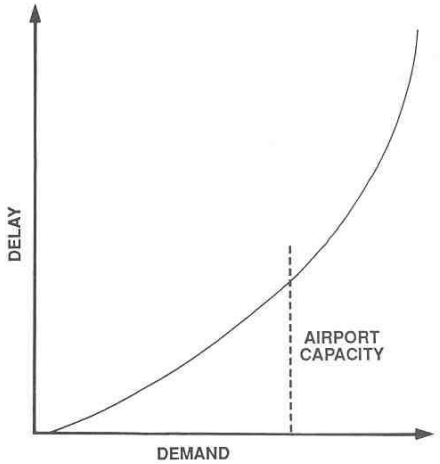
In order to provide an understanding of demand and capacity as related to aviation, the technical definitions and concepts behind these terms must be discussed, if only briefly.

The term demand refers to the amount or volume of aircraft, pilots and passengers who request the use of airport facilities, whether it be the use of apron or hangar space, fueling facilities, terminal building, or the airport's runways and taxiways. As demand for airport facilities rises, the airport begins to reach capacity – which is the airport's ultimate ability to handle the demand placed on its infrastructure. There are several factors that affect demand and capacity:

Factors which affect *capacity* – runway occupancy time, apron space, ATC procedures, taxiway layout, noise abatement procedures, size and location of terminal building, hangars, etc.

Factors which affect *demand* – airport FBOs, airport facilities, ATC services, local attractions, current state of economy, etc.

The relationship of demand vs. capacity and delay is shown at right. It can be seen that as demand for the airport increases, it begins to reach the limit of airport capacity, which is defined by existing facilities and airspace structure. As demand for airport services



Source: Transportation Research Board

nears capacity, delays begin to slowly increase, until airport capacity is reached. Once the airport has reached capacity, delays increase significantly. Simply put, as demand increases and approaches airport capacity, delays occur more often and persist longer[1].

3.3 METHODOLOGY

FAA Advisory Circular, AC 150/5060-5 Airport Capacity and Delay provides guidance on the preparation of demand-capacity analysis. Calculations and procedures are provided within the AC (Advisory Circular) to determine an airport's annual capacity based on the ASV (Annual Service Volume – an estimate of an airports annual capacity) as well as hourly capacity for VFR (Visual Flight Rules) and IFR (Instrument Flight Rules) operations.

When applied to Parlin Field, these calculations are too generic and yield unrealistic results. For example, using the FAA methodology Parlin Field would have the capacity for 215,000 annual operations (60-72 VFR or 20-24 IFR operations every hour). Therefore a more pragmatic approach was used in determining runway capacities at Parlin Field which consider local factors such as the airport traffic pattern and taxiway layout.

Airport demand is determined by applying the peak operations calculated in Section 2.6 to specific airside and landside facilities such as taxiways, aircraft parking aprons and automobile parking facilities. Once calculations of demand are prepared, the projections are compared against the known airport capacity and facility improvements are recommended to accommodate the expected demand. Both airport capacity and demand are discussed specific to Parlin Field below.

3.4 DEMAND / CAPACITY ANALYSIS

Increased demand for airport facilities at Parlin Field has occurred due to the addition of new aircraft storage hangars, a new FBO and improvement of existing facilities and changes in airport management. Where the airport once had excess capacity due to lack of demand, it is now experiencing significantly increased demand due to increased utilization.

3.4.1 Runways and Taxiways

Discussions with the airport manager and members of the Airport Advisory Board indicate that during periods of normal activity the runways at Parlin are capable of handling the demand of 20 aircraft operations per hour. During peak periods Parlin Field can experience demand for as many as 30 aircraft per hour. At peak periods runway

[1] Transportation Research Board (TRB)– Airport System Capacity, *Special Report 226*, p. 15

capacity is limited due to lack of an adequate taxiway system. Pilots must back taxi when departing Runway 36 and, as winds are predominately from the northwest, back taxiing operations occur quite often. Typical time to back taxi is approximately 3 minutes which adds to the runway occupancy time thereby reducing the runway's capacity.

Changes to the airport taxiway system should be considered under the facility requirements to help increase runway capacity to meet peak period demand.

3.4.2 Aircraft Parking Aprons

The airport currently has extremely limited aircraft parking capacity for both transient and based aircraft. There are only two paved apron spots and six turf tie-downs. All aircraft parking locations are in close proximity to the airport fuel farm and terminal building, which at times makes maneuvering difficult amongst multiple aircraft. During periods of extreme peak activity or special airport events, the turf runway is closed and utilized for transient aircraft parking.

During the summer months, several of the turf tie-downs are occupied by seasonal based aircraft. One based aircraft is tied down outside during the winter months. Demand exceeds both turf tie-down and paved apron parking capacity during mildly busy periods, especially during weekends with good weather.

Additional aircraft parking space (both paved and turf) should be considered under the facility requirements to increase transient aircraft parking options.

3.4.3 Aircraft Storage Hangars

The majority of based aircraft are stored in hangars at Parlin Field. However, there are some seasonally based aircraft that occupy outdoor tie-down spaces during the summer months, as noted above. The airport is near capacity with regard to available aircraft hangar space. The preferred forecast from Section 2.5 suggests an additional 5 based aircraft at Parlin over the planning period. It is anticipated that these aircraft would prefer to be stored in a hangar. There is currently a waiting list with two aircraft owners that wish to store their aircraft in the Community hangar and several aircraft owners that are waiting to rent/purchase individual aircraft condo units once they become available.

The airport has reached capacity for aircraft storage hangar space. Additional aircraft storage options should be considered.

3.4.4 Terminal Building

At 844 sq. ft., the airport terminal building is adequately sized to meet anticipated demand over the planning period. Scheduled events where capacity is expected exceed that provided by the terminal building are usually held at one of the airports privately owned hangars to meet the anticipated demand.

3.4.5 Automobile Parking Lot

The airport parking lot has the capacity to accommodate 15 automobiles. Airport tenants that own/operate aircraft generally park their vehicles in the gravel lot areas adjacent to the aircraft storage hangars. During peak periods or special airport events, overflow parking is accommodated alongside the Class VI (dirt) road or Corbin Road.