FLYMHK
Manhattan Regional Airport

Chapter 3
Aviation Forecasts

Introduction

This chapter contains aviation activity forecasts for Manhattan Regional Airport (MHK) over the 20-year planning horizon. Aviation demand forecasts are an important step in the terminal planning process. Ultimately, they form the basis for future demand-driven improvements at the Airport, they provide data from which to estimate future off airport needs such as terminal space and parking.

Enplanements are defined as the activity of passengers boarding commercial service aircraft that depart an airport. Enplanements include passengers on scheduled commercial service aircraft or un-scheduled charter aircraft but not the airline crew. Passenger enplanement data is provided to Airport management by commercial passenger service carriers, who maintain data as they transport people to and from the facility.

Forecasts of enplanements for MHK were prepared in the Airport's 2009 Airport Master Plan and the 2009 Kansas State System Plan. These forecasts were prepared prior to significant increases in air service offerings at the airport which has significantly altered the type of service and increased the number of passengers using the airport. Therefore these forecasts are not indicative of the current passenger levels and new passenger forecasts will be prepared as part of this chapter.

The Federal Aviation Administration's (FAA) 2011-2015 ***National Plan of Integrated Airport Systems*** (NPIAS) categorizes Manhattan Regional Airport as a "Primary Nonhub Airport." The NPIAS defines a Nonhub Primary Airport as a commercial service airport that enplanes more than 10,000 but less than 0.05 percent of total U.S. Passengers enplanements. The 2011-2015 NPIAS reported that there are 244 nonhub airports that together account for 3% of all enplanements nationwide. The NPIAS identifies existing and proposed airports that are significant to the national air transportation system. It contains estimates of costs of airport development projects eligible for federal aid that are needed to meet aviation demand over the next five years.

The FAA has estimated figures on file called Terminal Area Forecasts (TAF) that is compared with the projections developed for this Master Plan. Forecasts that are developed for airport master plans and/or federal grants must be approved by the FAA. It is the FAA's policy, listed in AC 150/5070-6B, Airport Master Plans, that FAA approval of forecasts at non-hub airports with commercial service should be consistent with the TAF. Master plan forecasts for operations, based aircraft, and enplanements are considered to be consistent with the TAF if they meet the following criteria:

a) Forecasts differ by less than 10 percent in the five-year forecast and 15 percent in the 10-year or 20-year period, or
b) Forecasts do not affect the timing or scale of an airport project, or
c) Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.3, Field Formulation of the National Plan of Integrated Airport Systems.

This chapter, which presents aviation activity forecasts through 2030, is organized as follows:

1. Overview
2. Airline Passenger Forecasts
3. Commercial Aircraft Operations Forecasts
4. Based Aircraft Forecasts
5. Based Aircraft Fleet Mix
6. General Aviation Operations Forecasts
7. Military Operations Forecasts
8. Peak Passenger Activity and Operations Forecasts
9. Forecast Summary and TAF Comparison

3.1 Airline Passenger Forecasts

In 2011, a Passenger Demand Analysis was conducted for Manhattan Regional Airport focusing on travel patterns of local airline passengers who reside in the Manhattan geographic area. Specifically, the Analysis examined:

- The originating airports used by air travelers
- Diversion of airline passenger traffic to competing airports
- An estimate of total airline passengers in the catchment area and related destinations
- Airlines used by local air travelers
- Average airfares by origin and destination airport
- Service levels at MHK and competing airports
- An assessment of the air service situation at MHK

Some of the key findings of the Passenger Demand Analysis include:

- MHK's total air service market, called the true market, is estimated at 415,191 annual origin and destination passengers or 624 passengers daily each way.
- Nineteen percent of catchment area travelers used MHK, while the other 81 percent diverted to Kansas City International (MCI).

- When using MHK (based on US DOT data), catchment area travelers flew with American Airlines 96 percent of the time and Great Lakes just four percent of the time reflecting Great Lakes' three months of service in 2010.
- From 2001 through 2010, MHK's domestic origin and destination passengers (as reported by airlines to the US DOT) increased at a compounded annual growth rate (CAGR) of 15.7 percent. MHK passengers have ranged from 11,160 (2004) to 74,750 (2010). MHK's dramatic rise in passengers in 2009/2010 reflects the impact of American's DFW service which was initiated in August of 2009, with the first full month of service in September of 2009.
- MHK's catchment area support of American's service provides a solid foundation for attracting new service; in fact the addition of a second ORD roundtrip was recently announced by American Airlines for initiation in November 2011. Care should be exercised that additional new or expanded service should complement existing service with minimal diversion. The addition of service to the Denver hub, Las Vegas, and possibly Orlando service are the best new service opportunities for MHK.

The Air Service Market Research report was also completed in 2011 to review the impact of American Airlines service on the performance at Manhattan Regional Airport and to further evaluate the potential of new service at MHK. Some of the key findings of the ASMR are as follows:

- MHK load factors have increased significantly since American Airlines entered the market. Prior to American, load factors averaged 31 to 54 percent by quarter from 2008 forward. Post American service, the load factor peaked in the third quarter 2010 at 83 percent.
- The MHK domestic market increased to $17 million in 2010 and continues to increase with the new American service.
- In a ranking of domestic and international passenger, MHK ranked 272nd in passengers and 260th in revenue of all US airports.
- Eight percent of Manhattan's passengers were to international destinations. This trailed the national average of 11 percent but it should increase with better hub connecting service.
- MHK ranked 134th out of 171 on a passenger basis and ranked 130th in revenue in 2010.
- Air service opportunities were evaluated for all potential carriers, hubs and destinations including fleet compatibility.

Copies of both the Passenger Demand Analysis and Air Service Market Research reports can be obtained by contacting the Airport Director.

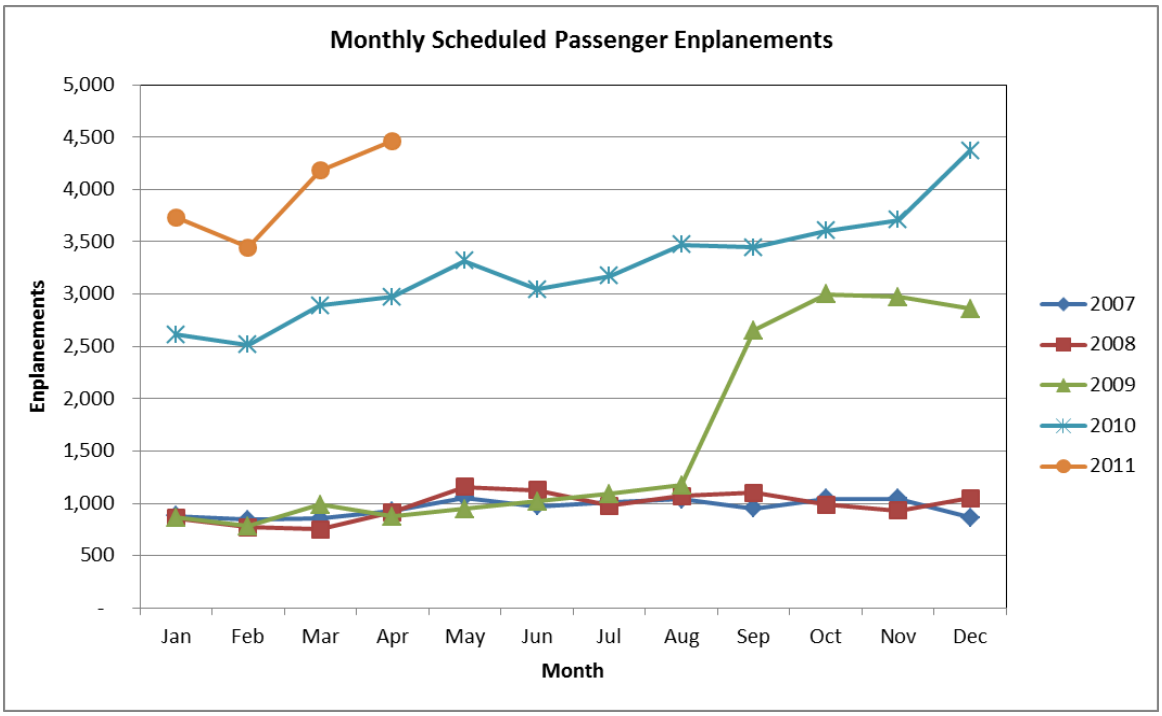
3.1.1 Passenger Enplanements

Table 3-1 presents the historical annual passenger enplanements from 2000 to 2010 and charts monthly scheduled passenger enplanements since 2007 through April of 2011. Total enplanements from 2000 through 2008 were relatively consistent, between a low of 11,395 and a high of 16,489. Scheduled carrier enplanements at Manhattan Regional Airport have significantly increased since the introduction of American Airlines service to Dallas-Fort Worth in August of 2009, with the first full month of service being September of 2009. There was also a significant increase in enplanements with the introduction of American Airlines service to Chicago-O'Hare in late November of 2010.

Data on nonscheduled carrier enplanements is shown from 2006 through 2009; these nonscheduled enplanements reported to the FAA have been between 2,716 and 5,849. These are typically passenger charters for military personnel to/from Ft. Riley, and university athletic charters to/from Kansas State University (KSU) for athletic events. It should also be noted that in 2009 and 2010, runway construction reduced the amount of runway length available and forced some larger B737 and B757 Ft. Riley passenger charters to utilize other airports.

Table 3-1
Historical Passenger Enplanements

Year	Scheduled Carrier Enplanements	Nonscheduled Carrier Enplanements	Total Enplanements
2000	NA	NA	15,490
2001	NA	NA	13,543
2002	NA	NA	15,085
2003	NA	NA	11,395
2004	NA	NA	13,479
2005	NA	NA	15,140
2006	10,860	4,109	14,969
2007	11,313	2,716	14,029
2008	11,649	4,840	16,489
2009	19,225	5,849	25,074
2010	39,126	5,357	44,483



Sources: Hist Enplanements - 2000-2010 FAA Office of Planning & Programming
Monthly Enplanements - Airport Records

3.1.2 Nonscheduled Passenger Enplanement Projection

By their very nature, charter flights are difficult to forecast as they are operated on the demand of their customer. The two primary generators of nonscheduled activity at MHK are charters related to KSU sports teams and those related to Ft. Riley personnel transport. **Table 3-2** depicts total charter operations reported by the airport's fixed base operator (FBO) for 2008 through 2010. Also noted is the number of nonscheduled passenger boarding's reported by the various aircraft operators to the FAA. The two data sources indicate an approximate load factor of 79 to 81%, which is a reasonable load factor for charter operations, indicating that the two data sets correlate well with each other and the data appears fairly reasonable and well reported.

Table 3-2
Nonscheduled airline activity by type

		2008	2009			2010		
Aircraft Type	**Approx Seats**	**Total**	**KSU**	**Ft. Riley**	**Total**	**KSU**	**Ft. Riley**	**Total**
Total Charter Operations								
B757	200	11		6	6	4	5	9
A320	165	8	7		7	1	9	10
B737	150	45	5	61	66	3	44	47
A319	140	2	4		4			
MD-80	140	1				5		5
DC9	125	1				4		4
CRJ 200	50	4						
EMB145	50	14	21		21	19		19
Dornair 328	32	11	20		20	21		21
EMB120	30					9		9
Total		97	57	67	124	66	58	124
Departing Seats (Assuming 1/2 of total operations are departures)								
B757	200	1,100	0	600	600	400	500	900
A320	165	660	578	0	578	83	743	825
B737	150	3,375	375	4,575	4,950	225	3,300	3,525
A319	140	140	280	0	280	0	0	0
MD-80	140	70	0	0	0	350	0	350
DC9	125	63	0	0	0	250	0	250
CRJ 200	50	100	0	0	0	0	0	0
EMB145	50	350	525	0	525	475	0	475
Dornair 328	32	176	320	0	320	336	0	336
EMB120	30	0	0	0	0	135	0	135
	Total Departing Seats	6,034	2,078	5,175	7,253	2,254	4,543	6,796
Reported Unscheduled Passenger Boardings		4,840			5,849			5,357
	Approx. Load Factor	80%			81%			79%

Note: 2008 Charters not specified by Type (i.e. KSU vs. Ft. Riley)
Sources: Total Charter Flights, FBO (Kansas Air Center)

The FBO also noted that in both 2009 and 2010 runway construction was occurring at MHK which reduced the amount of runway length available and forced some larger charter operations to other airports. For 2010 the FBO estimated the number of diverted charter flights as twenty-five narrow body (B757, B737, A320) type aircraft departures and the same number of return arrivals. Assuming a similar split between B757 (9%), B737 (76%), and A320 (15%) charter flights as the remainder of 2010, indicates that an additional 3,950 departing seats were diverted elsewhere because of the lack of available runway length. Assuming an 80% load factor on these diverted fights indicates that the airport would have

boarded approximately an additional 3,160 charter passengers, putting them on pace for nearly 8,520 unscheduled passenger boarding's in 2010 (2010 total of 5,357 enplanements plus the 3,160 of diverted passengers).

Charter activity associated with KSU is fairly consistent, being comprised primarily of narrowbody aircraft for KSU or visiting team football team charters and regional jets for basketball and volleyball charters. There are also some occasional fan charters to high profile away games such as college football bowl games. This activity is generally fairly consistent and anticipated to remain so through the forecast period.

Troop transport associated with Ft. Riley is primarily to transfer military personnel. This activity has increased slightly over the past few years as the population at Ft. Riley has increased. This activity is anticipated to remain at or about the same as the activity that would have occurred in 2010 if not for the runway project.

Table 3-3 summarizes the projected unscheduled passenger enplanements.

Table 3-3
Nonscheduled Passenger Enplanement Projection

Year	Nonscheduled Enplanements
Historical	
2007	2,716
2008	4,840
2009	5,849
2010	5,357 *
*Projected to have been 8,520 if runway hadn't been shortened for construction.	
Projected	
2015	8,520
2020	8,520
2025	8,520
2030	8,520

Source: FAA reports and FBO charter activity information

3.1.3 Scheduled Passenger Enplanement Projections

Due to recent air service additions, scheduled passenger enplanements have significantly increased since late 2009, and newly anticipated air service additions are anticipated to continue to increase enplanement levels through 2012. As was shown in Table 2 and previously mentioned, monthly seats and passengers increased with the introduction of American Airlines service to Dallas-Fort Worth in September of 2009. There was also another noted increase in enplanements with the introduction of American Airlines service to Chicago-O'Hare in late November of 2010. The current air carrier schedules include three daily round-trips to Dallas-Fort Worth and one daily round-trip to Chicago-O'Hare.

Table 3-4 summarizes the number of enplanements through April for 2009, 2010, and 2011. As shown below scheduled year to date passenger enplanements through April are currently 44% higher than in 2010, putting the airport on pace for 56,320 scheduled passenger enplanements in 2011. It has also been recently announced that a second MHK-ORD round-trip flight, five times per week will be initiated in November of 2011. This will be approximately 13,000 additional departing seats in 2012 above the 2011 seats. The ORD service has been having slightly lower load factors than the DFW service, therefore assuming a 70% load factor on these seats indicates that 2012 will likely have an additional 9,100 scheduled passenger enplanements than the anticipated 2011 level.

Given these recent significant increases in scheduled passenger enplanements, the projected 2011 and 2012 passenger levels will be included as evaluation years in this analysis.

Table 3-4

Projected 2011 Scheduled Passenger Enplanements

Year	Year to Date Enplanements Through April	Percent Change	Annual Enplanements
2009	3,507		19,225
2010	10,991	213%	39,126
2011	15,821	44%	*56,320*
2012	-	-	*65,420*

[1]2011 Estimated at 44% over 2010 Enplanement Level

[2] Includes full year addition of 2nd daily ORD round trip 5x per week

Sources: Monthly Enplanements - Airport Records
Projections - Mead & Hunt

Given the significant recent changes in the air service levels and passenger levels at MHK, historical trend line analysis isn't appropriate. Therefore a market share methodology was used to project future scheduled passenger enplanements. The market share methodology compares activity levels at an airport to a larger geographical region as a whole over a given length of time. For the purposes of this analysis the market share methodology compares activity at Manhattan Regional Airport with total U.S. domestic enplanements. The FAA develops national forecasts annually in its FAA Aerospace Forecast document, taking into consideration such items as projected U.S. and world economies, gross domestic products, fuel prices, carrier capacities, and other considerations.

As shown in **Table 3-5**, the anticipated number of enplanements in 2011 is 56,320, which represents 0.0086 percent of the total U.S. domestic market. The market share methodology applies this market share to projections of total U.S. domestic enplanement projections described in the FAA Aerospace Forecasts 2011-2031 (see Table 5).

Table 3-5

Projected Scheduled Passenger Enplanements

	Market Share Methodology		
Year	**MHK Enplanements**	**Total U.S. Domestic Enpl (mil)**	**MHK Market Share**
Historical:			
2006	10,860	668.4	0.0016%
2007	11,313	690.1	0.0016%
2008	11,649	680.7	0.0017%
2009	19,225	630.8	0.0030%
2010	39,126	635.3	0.0062%
Projected:			
2011	56,320	654.0	0.0086%
2012	65,420	675.0	0.0097%
2015	72,931	752.5	0.0097%
2020	83,960	866.3	0.0097%
2025	93,623	966.0	0.0097%
2030	102,511	1,057.7	0.0097%
CAGR (2010-2030)	*4.93%*	*2.58%*	
CAGR (2011-2030)	*3.20%*	*2.56%*	

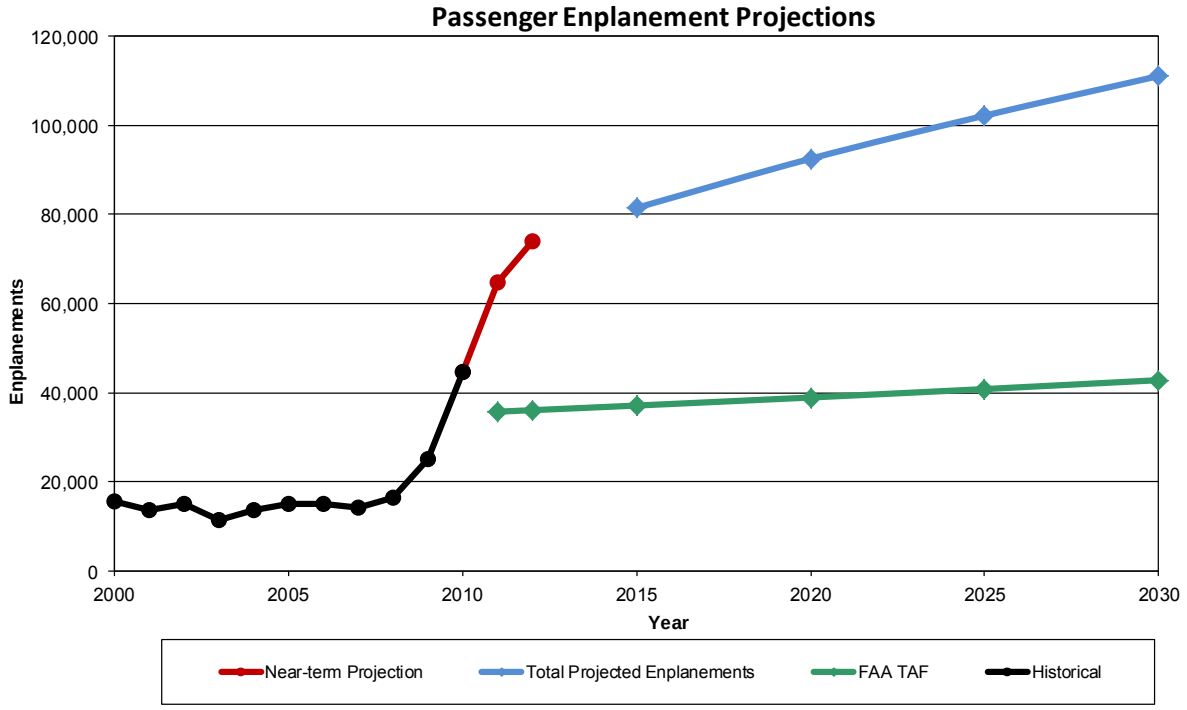
Notes: CAGR = Compounded Annual Growth Rate
Sources: Hist Enplanements - 2006-2009 FAA Office of Planning & Programming; 2010 Airport Records
Total U.S. Domestic Enplanements - FAA Aerospace Forecasts 2011-2031
Projections - Mead & Hunt

3.1.4 Total Passenger Enplanement Projections

Table 3-6 summarizes the total scheduled and nonscheduled passenger enplanement projections in comparison to the FAA Terminal Area Forecasts.

Table 3-6
Passenger Enplanement Projections Summary

Year	Scheduled Enplanements	Nonscheduled Enplanements	Total Enplanements	FAA TAF Total Enplanements
Historical:				
2000	NA	NA	15,490	14,592
2001	NA	NA	13,543	14,566
2002	NA	NA	15,085	14,236
2003	NA	NA	11,395	8,950
2004	NA	NA	13,479	6,555
2005	NA	NA	15,140	13,088
2006	10,860	4,109	14,969	13,167
2007	11,313	2,716	14,029	14,037
2008	11,649	4,840	16,489	13,757
2009	19,225	5,849	25,074	17,863
2010	39,126	5,357	44,483	35,365
CAGR (2000-2010)			*11.13%*	
Projected:				
2011	56,320	8,520	64,840	35,702
2012	65,420	8,520	73,940	36,042
2015	72,931	8,520	81,451	37,082
2020	83,960	8,520	92,480	38,887
2025	93,623	8,520	102,143	40,783
2030	102,511	8,520	111,031	42,777
CAGR (2010-2030)	*4.93%*	*2.35%*	*4.68%*	*0.96%*



Notes: CAGR = Compounded annual growth rate.
Sources: Historical Enplanements - Airport Records
Projections - Mead & Hunt, Inc., except FAA TAF Summary which are from the FAA Terminal Area Forecast

3.2 Commercial Aircraft Operations Forecasts

The following sections describe projections of aircraft operations. As with passenger enplanements, several factors are taken into account when assessing demand in both commercial and non-commercial operations. Forecasts have been developed for the following categories:

- Commercial Operations
- Air Carrier Fleet Mix

3.2.1 Commercial Operations

Commercial operations can be either scheduled or un-scheduled. Typically, un-scheduled commercial flights are chartered flights or air taxi flights. In recent years, the proportion of un-scheduled operations at Manhattan Regional Airport has decreased.

Scheduled Commercial Passenger Operations Projections

National trends in aviation demand have been volatile in recent years. The events that occurred on 9/11/2001 had a significant impact on collective national travel behavior, and the economic recession that began in 2008 has resulted in fewer passenger enplanements at several airports in the U.S. With recent increases in aircraft operating costs, airlines have been forced to maximize fleet efficiency in order to remain profitable, if not sustainable.

In many markets, air carriers are reducing or retiring less fuel efficient aircraft with regional and larger jets that have more seats and lower operational costs per passenger. In many markets, the use of larger aircraft is reducing the frequency of particular routes. Because of increasing fuel and operational costs, air carriers must maintain higher passenger load factors to remain profitable. Projections of scheduled commercial operations are based on enplanement projections described in Section 2.2. At Manhattan Regional Airport, the average number of seats per aircraft departure has changed significantly since the introduction of the 50 regional jet services and the discontinuance of the 19 seat turboprop service. The number of seats per departure is projected to continue to rise as 50 seat regional jets are replaced with 70 to 90 seat regional jets both nationally and in the MHK market. Additionally the market has the strong potential for narrowbody service (which is typically 130 to 150 seats) a few times per week to leisure destinations, and would be anticipated to increase the average seat size. The number of seats per departure is anticipated to increase from 39.8 in 2010, to 62.0 in 2015, 63.0 in 2020, 64.0 in 2025, and 65.0 in 2030. Passenger load factor is also anticipated to remain steady through the projection period. The load factor is projected to slowly increase through the projection period from, 75% in 2015 to US regional carrier average of 77%. **Table 3-7** presents the projected average seats per departure and load factor.

Table 3-7

Average Seat/Departure and Load Factor Projection

	Average Seats/Dep		Load Factor % (Domestic)	
Year	MHK	US Regional Carrier Fleet	MHK	US Regional Carrier Fleet
Historical:				
2008	19.0	52.8	34.6%	73.7%
2009	22.4	55.0	38.4%	74.3%
2010	39.8	56.2	73.9%	75.8%
Projected:				
2015	62.0	58.6	75.0%	76.8%
2020	63.0	60.8	75.0%	77.1%
2025	64.0	63.1	76.0%	77.2%
2030	65.0	65.4	77.0%	77.3%

Sources: Hist Average Seat Data - apgDat
Hist Load Factor Calculated from Historial Passengers (airport records), Historcial Seats (apgDat)
Hist and Projected US Carrier Fleet Avg/Seats & Load Factor - FAA Aerospace Forecasts FY2011-2031
Projections - Mead & Hunt, Inc.

To calculate future scheduled commercial operations, the average number of seats per departure at the Airport is multiplied by the passenger load factor. Projected passenger enplanements are divided by this figure to obtain scheduled commercial passenger departures. It is assumed that the number of annual commercial departures and arrivals will be the same; departures are multiplied by two to calculate projected scheduled commercial operations (see **Table 3-8**). 2,613 scheduled commercial operations are projected in 2015, 2,960 in 2020, 3,250 in 2025, and 3,503 in 2030, a CAGR of 1.39 percent.

Table 3-8
Scheduled Passenger Operations Projection

Year	Scheduled Enplanements	Scheduled Passenger Dep	Average Seats/Dep	Load Factor	Scheduled Passenger Ops
Historical:					
2008	11,649	1,773	19.0	34.6%	3,546
2009	19,225	2,237	22.4	38.4%	4,474
2010	39,126	1,330	39.8	73.9%	2,660
Projected:					
2015	72,931	1,568	62.0	75.0%	3,137
2020	83,960	1,777	63.0	75.0%	3,554
2025	93,623	1,925	64.0	76.0%	3,850
2030	102,511	2,048	65.0	77.0%	4,096
CAGR (2010-2030)	*4.93%*	*2.18%*			*2.18%*

Sources: Hist Enplanements - Airport Records
Hist Scheduled Air Carrier Dep's and Avg Seat Data - apgDat
Projections - Mead & Hunt, Inc.

Table 3-9 presents the historical and projected scheduled passenger fleet. Commercial aircraft equipped with 40 or fewer seats left the market in early 2010 and the market is currently served exclusively with 50 seat regional jets. As noted it is anticipated that 50 seat regional jets will be replaced with 70 to 90 seat regional jets by the carriers through the projection period, both nationally and at MHK. Additionally service by narrowbody aircraft, with 130 to 150 seats, a few times per week to leisure destinations, is anticipated through the projection period.

Table 3-9
Scheduled Carrier Fleet Mix Projection

Seat Range	Typical Aircraft	Historical Departures 2008	2009	2010	Projected - Departures 2015	2020	2025	2030
Less than 40	Beech 1900, EMB120, Saab340	1,773	1,992	312	0	0	0	0
		100.0%	*89.0%*	*23.5%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
40-60	CRJ200, ERJ145	0	245	1,018	1,145	1,226	1,251	1,249
		0.0%	*11.0%*	*76.5%*	*73.0%*	*69.0%*	*65.0%*	*61.0%*
61-99	CRJ700, CRJ900, EMB170	0	0	0	298	409	520	635
	EMB175	*0.0%*	*0.0%*	*0.0%*	*19.0%*	*23.0%*	*27.0%*	*31.0%*
100-130	B717, DC9, EMB190, EMB195	0	0	0	0	0	0	0
	A319	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
131-150	A320, MD80, B737-5	0	0	0	125	142	154	164
		0.0%	*0.0%*	*0.0%*	*8.0%*	*8.0%*	*8.0%*	*8.0%*
151 or more	B737-8, B737-9, B757	0	0	0	0	0	0	0
		0.0%	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Total Scheduled Passenger Aircraft Departures		1,773	2,237	1,330	1,568	1,777	1,925	2,048
Average Seats Per Departure		19.0	22.4	39.8	62.0	63.0	64.0	65.0
Total Scheduled Seats		33,664	50,043	52,953	97,241	111,947	123,188	133,131

Sources: Historical Scheduled Departures and Average Seat Data - apgDat
Projections - Mead & Hunt, Inc.

Nonscheduled Commercial Passenger Operations Projections

As noted earlier, nonscheduled passenger operations at MHK are quite substantial. These flights are typically passenger charters for military personnel to/from Ft. Riley, and university athletic charters to/from Kansas State University (KSU) for athletic events.

The FBO noted that in both 2009 and 2010 runway construction was occurring at MHK which reduced the amount of runway length available and forced some larger charter operations to other airports. For 2010 the FBO estimated the number of diverted charter flights as twenty-five narrow body (B757, B737, A320) type aircraft departures and the same number of return arrivals. It is assumed that these 50 operations have a similar fleet split between B757 (9%), B737 (76%), and A320 (15%) charter flights as the remainder of 2010 Ft. Riley passenger charters.

Charter activity associated with KSU is fairly consistent, being comprised primarily of narrowbody aircraft for KSU or visiting team football team charters and regional jets for basketball and volleyball charters. There are also some occasional fan charters to high profile away games such as college football bowl games. This activity is generally fairly consistent and anticipated to remain so through the forecast period.

Troop transport associated with Ft. Riley is primarily to transfer military personnel. This activity has increased slightly over the past few years as the population at Ft. Riley has increased. This activity is anticipated to remain at or about the same as the activity that would have occurred in 2010 if not for the runway project.

Table 3-10 summarizes the projected unscheduled passenger operations; demand through the projection period is anticipated to remain about the same as the 2010 demand.

Table 3-10
Nonscheduled airline activity by type

	2010 Operations				Projected Operations			
Aircraft Type	**KSU**	**Ft. Riley**	**Diverted**	**Total Demand**	**2015**	**2020**	**2025**	**2030**
Total Charter Operations								
B757	4	5	4	13	13	13	13	13
A320	1	9	8	18	18	18	18	18
B737	3	44	38	85	85	85	85	85
A319				0	0	0	0	0
MD-80	5			5	5	5	5	5
DC9	4			4	4	4	4	4
CRJ 200				0	0	0	0	0
EMB145	19			19	19	19	19	19
Dornair 328	21			21	21	21	21	21
EMB120	9			9	9	9	9	9
Total	66	58	50	174	174	174	174	174

Sources: Total Charter Flight Demand, FBO (Kansas Air Center)

3.3 Based Aircraft Forecasts

There are several factors that affect the number of aircraft at an airport. The overall cost to own and operate an aircraft has increased significantly in recent years, which contributed to a slight decline in the U.S. general aviation fleet since 2007; at Manhattan Regional Airport the number of based aircraft has fluctuated been between 45 and 54.

Total U.S. fleet projections are obtained from the FAA Aerospace Forecasts 2011-2031. MHK's market share of the total U.S. general aviation fleet has fluctuated between approximately 0.019% and 0.026% from 2000 to 2010, with an average of 0.022%. The Market Share Projection Methodology assumes that the Airport's market share will slightly increase from its current 0.020%, to its historic average of 0.022 by the year 2030. As shown below, the market share methodology projects 47 based aircraft in 2015, 50 in 2020, 55 in 2025 and 60 in 2030, a CAGR of 1.42 percent.

Table 3-11
Based Aircraft Projections

		Market Share Methodology		
Year	**FAA TAF**	**Based Aircraft**	**Total U.S. Active Aircraft**	**Market Share**
Historical:				
2000	45	45	217,533	0.021%
2001	54	54	211,446	0.026%
2002	54	54	211,244	0.026%
2003	54	54	209,606	0.026%
2004	54	54	219,319	0.025%
2005	54	54	224,350	0.024%
2006	45	45	221,939	0.020%
2007	45	45	231,606	0.019%
2008	45	45	228,668	0.020%
2009	45	45	223,920	0.020%
2010	45	45	224,172	0.020%
			Average (2000-2010)	0.022%
2011				
2015	49	47	229,140	0.021%
2020	51	50	237,795	0.021%
2025	56	55	250,560	0.022%
2030	61	60	267,055	0.022%
CAGR (2010-2030)	*1.53%*	*1.42%*	*0.88%*	

Notes: CAGR = Compounded Annual Growth Rate
Sources: Hist Based Aircraft - FAA Terminal Area Forecast
Total U.S. Active Aircraft - FAA Aerospace Forecasts 2011-2031
Projections - Mead & Hunt

3.4 Based Aircraft Fleet Mix

Historical based aircraft by type and the projected based aircraft fleet mix at Manhattan Regional Airport is shown below. In 2010 73 percent of the local fleet was comprised of single engine aircraft and 27 percent multi-engine aircraft, with no based jet aircraft. The FAA Aerospace Forecast 2011-2031 projects that jet aircraft will see the most significant growth of any type of aircraft through 2030. This is a trend that is also anticipated to occur locally as jet aircraft are expected to increase to five percent by 2030.

Table 3-12
Based Aircraft Fleet Mix Projections

	Single Engine		Multi-Engine		Jet		Helicopter		Other		
Year	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**Total**
Historical:											
2000	29	64%	16	36%	0	0%	0	0%	0	0%	45
2001	42	78%	12	22%	0	0%	0	0%	0	0%	54
2002	42	78%	12	22%	0	0%	0	0%	0	0%	54
2003	42	78%	12	22%	0	0%	0	0%	0	0%	54
2004	42	78%	12	22%	0	0%	0	0%	0	0%	54
2005	48	89%	6	11%	0	0%	0	0%	0	0%	54
2006	33	73%	12	27%	0	0%	0	0%	0	0%	45
2007	33	73%	12	27%	0	0%	0	0%	0	0%	45
2008	33	73%	12	27%	0	0%	0	0%	0	0%	45
2009	33	73%	12	27%	0	0%	0	0%	0	0%	45
2010	33	73%	12	27%	0	0%	0	0%	0	0%	45
Projected:											
2015	34	71%	13	27%	1	2%	0	0%	0	0%	47
2020	35	69%	14	27%	2	4%	0	0%	0	0%	50
2025	38	69%	15	27%	2	4%	0	0%	0	0%	55
2030	41	68%	16	27%	3	5%	0	0%	0	0%	60
CAGR (2010-2030)	*1.04%*		*1.48%*		*NA*		*NA*		*0.00%*		*1.42%*

Notes: CAGR = Compounded Annual Growth Rate.
Numbers may not add due to rounding
Sources: Historical Based Aircraft - FAA Terminal Area Forecasts
Projections - Mead & Hunt, Inc.

3.5 General Aviation Operations Forecasts

General aviation operations are those which are not categorized as commercial or military. General aviation activity at the Airport has declined in recent years. In 2010 the number of annual operations per based aircraft was 351. This figure is applied to the projected number of based aircraft as described in Section 2.4 and results in 16,600 general aviation operations in 2015, 17,700 in 2020, 19,150 in 2025, and 20,943 in 2030, a CAGR of 1.42 percent.

Table 3-13

General Aviation Operations Projection

Year	Based Aircraft	Operations per Based Aircraft	Total Operations
Historical:			
2002	45	590	26,534
2003	54	468	25,274
2004	54	487	26,279
2005	54	426	23,020
2006	54	359	19,370
2007	54	399	21,568
2008	45	379	17,071
2009	45	371	16,710
2010	45	351	15,793
	Avg (2002-2010)	*426*	
Projected:			
2015	47	351	16,600
2020	50	351	17,700
2025	55	351	19,150
2030	60	351	20,943
CAGR (2010-2030)	*1.42%*		*1.42%*

Notes: CAGR = Compounded Annual Growth Rate
Sources: Historical Operations - Air Traffic Activity Data System (ATADS)
Projections - Mead & Hunt, Inc.

Historically, itinerant general aviation operations have comprised approximately 56% of the total general aviation operations, while local operations have accounted for approximately 44% percent of total general aviation operations. It is anticipated that this split will remain constant throughout the projection period. A summary of projected local and itinerant general aviation operations is shown below.

Table 3-14
General Aviation Operations Summary

Year	Total GA Operations	Itinerant GA Operations	Itinerant GA Percent	Local GA Operations	Local GA Percent
Historical:					
2002	26,534	14,962	56%	11,572	44%
2003	25,274	15,257	60%	10,017	40%
2004	26,279	15,127	58%	11,152	42%
2005	23,020	12,898	56%	10,122	44%
2006	19,370	11,560	60%	7,810	40%
2007	21,568	11,372	53%	10,196	47%
2008	17,071	10,034	59%	7,037	41%
2009	16,710	9,046	54%	7,664	46%
2010	15,793	8,278	52%	7,515	48%
		Average (2002-2010)	*56%*	*Average (2002-2010)*	*44%*
Projected:					
2015	16,600	9,371	56%	7,229	44%
2020	17,700	9,993	56%	7,708	44%
2025	19,150	10,811	56%	8,339	44%
2030	20,943	11,823	56%	9,120	44%
CAGR (2010-2030)	*1.42%*	*1.80%*		*0.97%*	

Notes: CAGR = Compounded Annual Growth Rate.
Sources: Historical Operations - Air Traffic Activity Data System (ATADS)
Projections - Mead & Hunt, Inc.

3.6 Military Operations Forecasts

Military operations are driven more by policy decisions than by economic conditions, therefore military operations have been projected to remain at their average 2002-2010 levels. The number of military operations at the Airport is anticipated to remain flat throughout the projection period.

Table 3-15
Military Operations Projection

Year	Itinerant Operations	Itinerant %	Local Operations	Local %	Total
Historical:					
2002	1,057	62%	658	38%	1,715
2003	1,123	78%	316	22%	1,439
2004	1,240	81%	284	19%	1,524
2005	946	60%	636	40%	1,582
2006	728	40%	1,106	60%	1,834
2007	1,019	25%	3,014	75%	4,033
2008	530	76%	165	24%	695
2009	977	34%	1,890	66%	2,867
2010	516	69%	232	31%	748
Avg (2002-2010)	*904*	*58%*	*922*	*42%*	*1,826*
Projected:					
2015	1,066	58%	761	42%	1,826
2020	1,066	58%	761	42%	1,826
2025	1,066	58%	761	42%	1,826
2030	1,066	58%	761	42%	1,826

Sources: Historical Military Operations - FAA Air Traffic Activity Data System (ATADS)
Projections - Mead & Hunt, Inc.

3.7 Peak Passenger Activity and Operations Forecasts

Planning for facilities and equipment requirements is often based on peak periods of passenger and aircraft activity. This section identifies monthly, daily, and hourly peaking characteristics for passenger and aircraft activity at Manhattan Regional Airport.

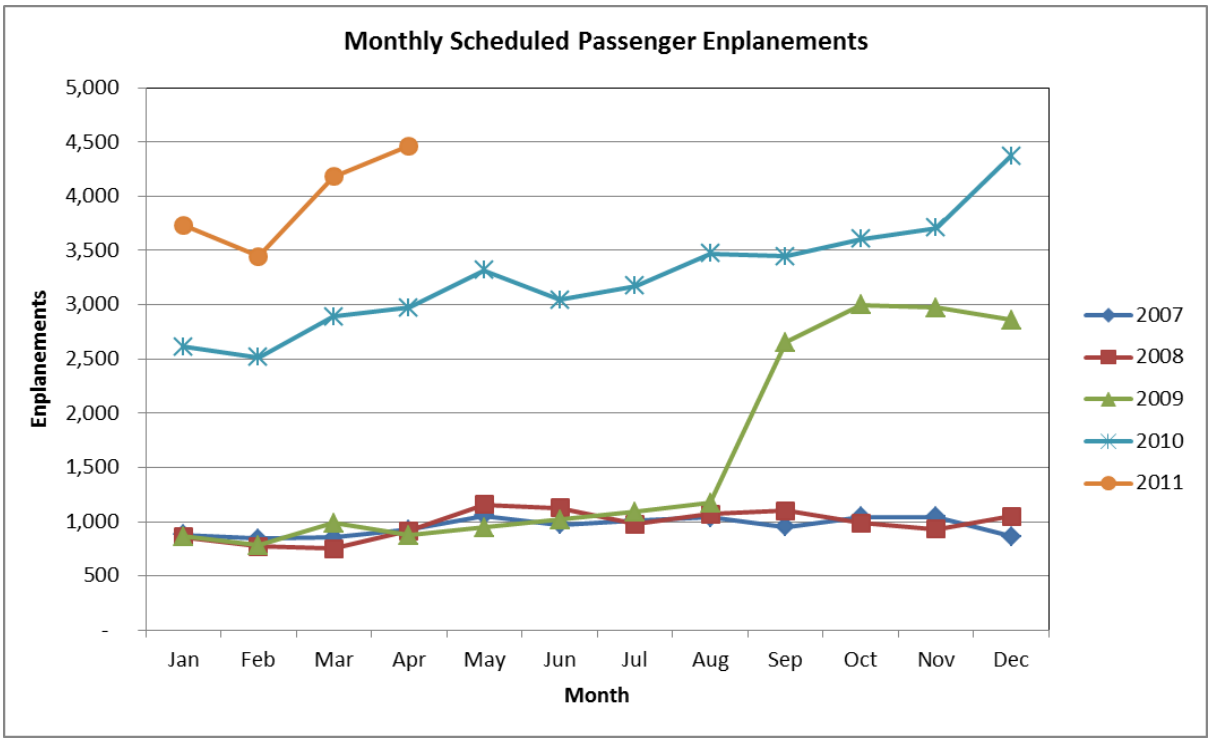
3.7.1 Peak Enplanements and Passenger Activity Forecasts

Table 3-16 presents scheduled monthly passenger enplanements. As shown below, significant air service changes recently have made the determination of a peak month for the current American Airlines service to DFW and ORD difficult. Examination of the steady 2007 and 2008 monthly passenger levels, which had consistent air service levels, indicates that the months are fairly equal with a slight peak in May with 9.9% of the annual activity.

Table 3-16

Historical Monthly Passenger Enplanements

Month	2007	2008	2009	2010	2011
Jan	879	857	862	2,612	3,734
Feb	843	773	784	2,516	3,444
Mar	855	752	985	2,888	4,179
Apr	925	915	876	2,975	4,464
May	1,054	1,157	944	3,317	
Jun	971	1,124	1,017	3,045	
Jul	1,013	976	1,092	3,174	
Aug	1,037	1,072	1,173	3,472	
Sep	952	1,100	2,652	3,447	
Oct	1,044	985	3,000	3,603	
Nov	1,045	930	2,974	3,708	
Dec	864	1,049	2,862	4,369	
Total	11,482	11,690	19,221	39,126	
Peak Month	1,054	1,157	3,000	4,369	
Percent	9.2%	9.9%	15.6%	11.2%	



Sources: Monthly Enplanements - Airport Records

It is assumed that peak monthly enplanements and deplanements will be equal, and that peak month enplanements will continue to be 9.9 percent of annual activity. This figure is applied to projections of passenger enplanements described in Section 2 and shown in **Table 3-17**.

Table 3-17
Peak Month Scheduled Passenger Enplanements

Year	Annual Enplanements	Peak Month % of Total	Peak Month Enplanements	Peak Month Deplanements	Peak Month Total Activity
Historical					
2010	39,126	11.2%	4,369	4,369	8,738
Projected					
2011	56,320	9.9%	5,576	5,576	11,151
2015	72,931	9.9%	7,220	7,220	14,440
2020	83,960	9.9%	8,312	8,312	16,624
2025	93,623	9.9%	9,269	9,269	18,537
2030	102,511	9.9%	10,149	10,149	20,297

Sources: Monthly Enplanements - Airport Records
Projections - Mead & Hunt

3.7.2 Peak Daily Passenger Activity Forecasts

It should be noted that planning for facility and equipment requirements is based on the probable demand that may occur over time. If planning is contingent on the absolute busiest periods of activity, it can lead to overestimation, overspending, and inefficiencies. Daily peak activity figures are based on a typical day during the peak month. It is assumed that the peak month is May, with 31 days. Peak month enplanements/deplanements are divided by the number of days in the peak month to determine the average daily passenger enplanements/deplanements that occur in the peak month. **Table 3-18** presents the peak month average day scheduled passenger activity.

Table 3-18
Peak Month Average Day Scheduled Passenger Enplanements

Year	Peak Month Enpl/Depl	Day in Peak Month	Peak Month - Average Day (Scheduled) Enplanements	Peak Month - Average Day (Scheduled) Deplanements	Peak Month - Average Day (Scheduled) Total Activity
Historical					
2010	4,369	31	141	141	282
Projected					
2011	5,576	31	180	180	360
2015	7,220	31	233	233	466
2020	8,312	31	268	268	536
2025	9,269	31	299	299	598
2030	10,149	31	327	327	655

Sources: Monthly Enplanements - Airport Records
Projections - Mead & Hunt

3.7.3 Peak Hour Passenger Activity Forecasts

The number of arriving and departing seats according to the current daily air carrier schedule is depicted in **Table 3-19**.

Table 3-19

Current Scheduled Carrier Schedule/Ramp Chart

Arrivals					Departures				
Carrier	**Origin**	**Arr time**	**Equip**	**Seats**	**Carrier**	**Dest**	**Dep Time**	**Equip**	**Seats**
AA					AA	DFW	0635	ER4	50
AA					AA	ORD	0725	ER4	50
AA	DFW	1120	ER4	50	AA	DFW	1155	ER4	50
AA	DFW	1645	ER4	50	AA	DFW	1725	ER4	50
AA	ORD	2100	ER4	50	AA				
AA	DFW	2135	ER4	50	AA				

Sources: ApgDat - September 2011 Schedule

Peak hour departing seats occurs between 6:30am and 7:30am, and peak hour arriving seats occurs between 9:00pm and 10:00pm. It has recently been announced that a second daily MHK-ORD round-trip flight, five times per week will be initiated in November 2011. The schedule for this flight has it arriving at noon and departing at 12:40 pm. This additional flight would create a second arrival and departure peak of equal size to the current early morning departure peak and late night arrival peak.

The percentage of daily seats during the peak hour is applied to the average daily passenger figures and shown in **Table 3-20**.

Table 3-20

Scheduled Peak Hour Passenger Projections

Time of Day	Number of Seats	Total Daily Seats	Percent of Day in Peak Hour (PH)
Peak Hour Departing Seats (Enplanements)			
0630 to 0730	100	200	50.0%
Peak Hour Arriving Seats (Deplanements)			
2100 to 2200	100	200	50.0%

Peak Hour			**Peak Hour Passengers**	
	Average Day Passengers		**Enplanements**	**Deplanements**
Year	**Enplanements**	**Deplanements**	***50.0%***	***50.0%***
Historical				
2010	141	141	70	70
Projected				
2011	180	180	90	90
2015	233	233	116	116
2020	268	268	134	134
2025	299	299	149	149
2030	327	327	164	164

Source: ApgDat - September 2011 Schedule
Projections- Mead & Hunt

Peak Hour Including Nonscheduled Passenger Operations

In accordance with FA Advisory Circular 150/5360-13, *Planning and Design Guidelines for airport Terminal Facilities* nonscheduled operaitons are normally not considered the primary basis for terminal planning and it is recommended that they be evaluated separately.

As noted earlier, nonscheduled charter passenger operations at MHK are quite substantial. These flights are typically passenger charters for military personnel to/from Ft. Riley, and university athletic charters to/from Kansas State University (KSU) for athletic events. Charter activity is summarized in **Table 3-21**.

Table 3-21
Charter Activity

		2010 Operations				Projected Operations			
Aircraft Type	**Approx Seats**	**KSU**	**Ft. Riley**	**Diverted**	**Total Demand**	**2015**	**2020**	**2025**	**2030**
Total Charter Operations									
B757	200	4	5	4	13	13	13	13	13
A320	165	1	9	8	18	18	18	18	18
B737	150	3	44	38	85	85	85	85	85
A319	140				0	0	0	0	0
MD-80	140	5			5	5	5	5	5
DC9	125	4			4	4	4	4	4
CRJ 200	50				0	0	0	0	0
EMB145	50	19			19	19	19	19	19
Dornair 328	32	21			21	21	21	21	21
EMB120	30	9			9	9	9	9	9
Total		66	58	50	174	174	174	174	174

Sources: Total Charter Flight Demand, FBO (Kansas Air Center)
Projections - Mead & Hunt

Currently not all charters use the terminal building for passenger processing, partly due to the deficiencies in size of the existing terminal building facilities. The ability to accommodate charter operations through the terminal building should be evaluated and protected for to the extent practicable due to the regular and reoccurring nature of these operations at MHK. That being said, due to the erratic nature and atypical operations of many of these charter operations the impact of the charter activity will need to be evaluated on a facility by facility basis in terms of terminal planning and facility requirements. For instance some many large charters are University football teams and their baggage can be transferred directly to their charter bus upon arrival and will never need to be processed through the baggage claim facilities. However there are also a number of public charters which are operated and handled just like a regularly scheduled airline flight.

The total peak hour passenger demands would include the regularly occurring charter activity in addition to the regularly scheduled commercial activity. A good portion of the charter activity is made up of narrowbody aircraft with 140 to 165 seats at various times throughout the day, therefore the addition of a charter flight of this size, in addition to the regularly scheduled activity should be considered. **Table 3-22** summarizes the peak hour activity associated with the scheduled and charter activity.

Table 3-22

Peak Hour Passengers - Scheduled & Charter

	Number of Seats	Load Factor	Passengers
Charter Flight	165	85.0%	140

Peak Hour Passengers - Scheduled & Charter

	Scheduled Airlines		Nonscheduled	Total Peak Hour Passengers	
Year	Enplanements	Deplanements	Charter	Enplanements	Deplanements
Historical					
2010	70	70	140	211	211
Projected					
2011	90	90	140	230	230
2015	116	116	140	257	257
2020	134	134	140	274	274
2025	149	149	140	290	290
2030	164	164	140	304	304

Source: ApgDat - September 2011 Schedule
Charter Activity, FBO (Kansas Air Center)
Projections- Mead & Hunt

3.8 Forecast Summary and FAA TAF Comparison

Passenger and aircraft activity at the Manhattan Regional Airport has increased significantly in recent history. The FAA template for summarizing and documenting airport planning forecasts and for comparing projections with the FAA TAF Forecasts are presented in **Table 3-23** and **Table 3-24**. The recent increases in air service have resulted in passenger projections that are well above the FAA TAF forecasts. The airport had 44,563 enplanements in 2010, and is on pace for over 56,000 enplanements in 2011. These totals are well above the TAF's 2030 projection of 42,777 enplanements, indicating that the FAA's TAF projections need to be revised to reflect the current air service and passenger volumes at the airport.

Table 3-23

FAA Template for Summarizing and Documenting Airport Planning Forecasts

A. Forecast Levels and Growth Rates

		Specify base year:		2010					
	2010	**2015**	**2020**	**2025**	**2030**		**Average CAGR**		
	Base Yr. Level	**Base Yr. + 5yr.**	**Base Yr. + 10yrs.**	**Base Yr. + 15yrs.**	**Base Yr. + 20yrs.**	**Base Yr. + 5yr.**	**Base Yr. + 10yrs.**	**Base Yr. + 15yrs.**	**Base Yr. + 20yrs.**
Passenger Enplanements									
TOTAL Air Carrier & Commuter	44,483	81,451	92,480	102,143	111,031	12.9%	7.6%	5.7%	4.7%
Operations									
Itinerant									
Air carrier	100	972	1,227	1,472	1,723	46.1%	25.6%	18.3%	14.5%
Commuter/air taxi	3,148	2,339	2,501	2,551	2,548	-4.8%	-2.1%	-1.3%	-1.0%
Total Commercial Operations	3,248	3,311	3,728	4,024	4,270	0.3%	1.3%	1.3%	1.3%
General aviation	8,278	9,371	9,993	10,811	11,823	2.1%	1.7%	1.7%	1.7%
Military	516	1,066	1,066	1,066	1,066	12.8%	6.8%	4.6%	3.5%
Local									
General aviation	7,515	7,229	7,708	8,339	9,120	-0.6%	0.2%	0.7%	0.9%
Military	232	761	761	761	761	21.9%	11.4%	7.7%	5.8%
TOTAL OPERATIONS	19,789	21,737	23,255	25,000	27,040	1.6%	1.5%	1.5%	1.5%
Based Aircraft									
Single Engine (Nonjet)	33	34	35	38	41	0.3%	0.5%	0.8%	1.0%
Multi Engine (Nonjet)	12	13	14	15	16	1.0%	1.2%	1.3%	1.4%
Jet Engine	0	1	2	2	3	-	-	-	-
Helicopter	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
Other	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
TOTAL	45	47	50	54	60	0.9%	1.0%	1.2%	1.4%

B. Operational Factors

	Base Yr. Level	**Base Yr. + 5yr.**	**Base Yr. + 10yrs.**	**Base Yr. + 15yrs.**	**Base Yr. + 20yrs.**
Average aircraft size (seats)					
Air carrier & Commuter	39.8	62.0	63.0	64.0	65.0
Average enplaning load factor					
Air carrier & Commuter	73.9%	75.0%	75.0%	76.0%	77.0%
GA operations per based aircraft	351	351	351	352	351

CAGR = Compound Annual Growth Rate

Table 3-24

FAA Template for Comparing Airport Planning and TAF Forecasts

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base Yr. Level	2010	44,483	35,365	25.8%
Base Yr. + 5yr.	2015	81,451	37,082	119.7%
Base Yr. + 10yrs.	2020	92,480	38,887	137.8%
Base Yr. + 15yrs.	2025	102,143	40,783	150.5%
Base Yr. + 20yrs.	2030	111,031	42,777	159.6%
Commercial Operations				
Base Yr. Level	2010	3,248	3,754	-13.5%
Base Yr. + 5yr.	2015	3,311	3,848	-14.0%
Base Yr. + 10yrs.	2020	3,728	3,943	-5.5%
Base Yr. + 15yrs.	2025	4,024	4,042	-0.5%
Base Yr. + 20yrs.	2030	4,270	4,142	3.1%
Total Operations				
Base Yr. Level	2010	19,789	21,649	-8.6%
Base Yr. + 5yr.	2015	21,737	20,899	4.0%
Base Yr. + 10yrs.	2020	23,255	21,772	6.8%
Base Yr. + 15yrs.	2025	25,000	22,686	10.2%
Base Yr. + 20yrs.	2030	27,040	23,651	14.3%

NOTES: TAF data is on a U.S. Government fiscal year basis (October through September).
Airport Forecast is on a calendar year basis.