FAA Regional Air Service Demand Study

Grant #:
3-36-0066-111-02

Task E — Assessment of Authority Airports' Capacity To Meet Current and Forecasted Demand

May 2007

Port Authority of New York & New Jersey

JFK –
John F. Kennedy
International Airport

LGA –
LaGuardia Airport

EWR –
Newark Liberty
International Airport

New York State Department of Transportation

SWF –
Stewart International
Airport

HPN –
Westchester County
Airport

ISP –
Long Island
MacArthur Airport

Delaware Valley Regional Planning Commission

ABE –
Lehigh Valley
International Airport

ACY –
Atlantic City
International Airport

TTN –
Trenton Mercer
Airport

SPONSORS:

Federal Aviation Administration

THE PORT AUTHORITY OF NY & NJ

FAA Regional Air Service Demand Study

Acknowledgements

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The Federal Aviation Administration
The Port Authority of New York and New Jersey

Consultant Team

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Grants

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EXECUTIVE SUMMARY

Introduction and Purpose

The Port Authority of New York and New Jersey (PANYNJ), in association with the Federal Aviation Administration (FAA), initiated a study to evaluate future air service demand in the region and to assess the ability of the three commercial airports operated by PANYNJ – John F. Kennedy International (JFK), Newark Liberty International (EWR), and LaGuardia Airport (LGA) - to accommodate that future demand. Under contract with the Port Authority of NY & NJ, and funded by an FAA grant, a team of aviation consultants lead by the Joint Venture of Parsons Brinckerhoff, Landrum & Brown, and Airport Interviewing and Research, initiated the FAA Regional Air Service Demand Study (the Study) in late November, 2004.

Included in the Study are an examination and assessment (under separate contracts) of the region's small hub airports, including Stewart International (SWF), Westchester County (HPN), and Long Island/MacArthur (ISP) Airports in New York State; Trenton Mercer (TTN) and Atlantic City International (ACY) Airports in New Jersey; and Lehigh Valley International Airport (ABE) in Pennsylvania to determine the extent to which underutilized regional airport capacity may exist. To some degree, the service areas of these airports overlap that of the Authority airports. It is therefore important to determine if these outlying airports can provide incremental capacity in the regional airport system.

Primary among the study tasks was the requirement to assess capacity at the three NY/NJ metropolitan large-hub commercial service airports, as well as the six small-hub regional airports noted above. The goal of the capacity assessment exercise was to:

- Assess existing (2004) landside, terminal and airfield capacity at JFK, LGA and EWR
- Compare existing (2004) capacity levels to unconstrained forecasts of demand for 2015 and 2025
- Identify the level of capacity required to meet the unconstrained forecasts for 2015 and 2025

This report presents the results and key findings associated with Task E: "The Assessment of Airport Capacity" and covers the analysis associated with the three commercial service airports operated by the Port Authority of New York and New Jersey - JFK, LGA and EWR.

Summary of Findings

Airside Capacity Analysis

Exhibit 1
JFK – Runway Delays and Average Annual Hourly Capacity Needs

	Arrival Delays			Departure Delays		
	2004	2015	2025	2004	2015	2025
Average	9.0	40.9	67.0	15.9	29.3	46.3
Peak Hour	30.3	116.9	191.8	56.6	87.1	128.5

Average annual hourly capacity required to maintain existing levels of service:

		2004	2015	2025
Balanced Flow (2004 & 2015 – One Arrival and One Departure Runway)				
	Arrivals	34	40	48
	Departures	36	40	48
	Total	70	80	96
Arrival Preference (Additional Flow Provided by 2nd Arrival Runway)				
	Arrivals	47	60	60
	Departures	36	40	48
	Total	83	100	108
Departure Preference (Additional Flow Provided by 2nd Departure Runway)				
	Arrivals	34	40	48
	Departures	44	60	60
	Total	78	100	108

In the event that existing runway utilization rates at JFK cannot be increased, the taxiway system must accommodate a total departure runway queue of 35 to 50 aircraft.

By 2025 JFK will need two fully airspace independent parallel runways, plus a third runway to accommodate peak flow conditions to accommodate the unconstrained level of aircraft activity. While these runways already exist at JFK, the ability to operate them independently without interference from LGA airspace does not yet exist. Additional research into air traffic control and aircraft guidance technology is required.

Exhibit 2
LGA – Runway Delays

	Arrival Delays			Departure Delays		
	2004	2015	2025	2004	2015	2025
Average	16	21	21	19	30	30
Peak Hour	35	51	51	29	46	46

To maintain existing levels of service:

- Regain the 2% of capacity (2 operations per hour) lost to wake-turbulence separations for B-757 and heavy jet (and smaller prop and jet aircraft) or,
- Increase taxiway capacity to accommodated departure queues on all configurations for 30+ aircraft

Exhibit 3
EWR – Runway Delays and Average Annual Hourly Capacity Needs

	Arrival Delays			Departure Delays		
	2004	2015	2025	2004	2015	2025
Average	18.5	61.1	124.0	19.4	48.5	92.2
Peak Hour	56.1	150.1	269.8	43.1	67.2	115.2

Average annual hourly capacity required to maintain existing levels of service:

		2004	2015	2025
Balanced Flow				
	Arrivals	42	48	60
	Departures	43	48	60
	Total	85	96	120
Arrival Preference				
	Arrivals	49	60	67
	Departures	40	40	40
	Total	89	100	107
Departure Preference				
	Arrivals	38	38	38
	Departures	50	60	67
	Total	88	98	105

In the event that existing runway utilization rates at EWR cannot be increased, the taxiway system must accommodate a total departure runway queue of 35 to 50 aircraft.

By 2025 EWR needs two fully airspace independent parallel runways, plus a third runway such as Runway 11/29 to accommodate peak flow conditions to accommodate this level of activity.

Terminal Capacity Analysis

Exhibit 4
JFK – Terminal Capacity Findings

Key Determinants -

	Million Annual Enplanements Based on:							
	Check-in Positions			SSCP	Gates	Holdrooms	Capacity Range	
	Dom.	Int'l	Combined	Lanes				
Terminal 1	0.0	2.0	2.0	1.5	1.9	2.0	1.5 -	2.0
Terminals 2 & 3	9.3	2.4	11.7	5.5	4.1	4.6	4.1 -	11.7
Terminal 4	0.2	4.7	4.9	3.7	4.8	4.7	3.7 -	4.9
Terminal 5	9.0	0.0	9.0	12.6	6.4	8.7	6.4 -	12.6
Terminal 6	10.2	0.0	10.2	4.9	2.5	1.7	1.7 -	10.2
Terminal 7	2.7	2.0	4.7	3.5	2.3	1.4	1.4 -	4.7
Terminal 8	2.8	2.3	5.1	4.2	5.6	5.6	4.2 -	5.6
				Airport Total Capacity Range:			**23.0 - million enplanements**	**51.7**

Secondary Determinants -

	Million Annual Enplanements Based on:				Capacity Range	
	Baggage Claim			Primary Inspection	International	
	Dom.	Int'l	Combined	Int'l		
Terminal 1	0.0	3.2	3.2	3.0	3.0 -	3.2
Terminals 2 & 3	4.1	1.4	5.5	1.4	1.4 -	1.4
Terminal 4	0.3	5.6	5.9	5.5	5.5 -	5.6
Terminal 5	10.1	0.0	10.1	0.0	0.0 -	0.0
Terminal 6	7.9	0.0	7.9	0.0	0.0 -	0.0
Terminal 7	1.0	1.5	2.5	2.8	1.5 -	2.8
Terminal 8	2.7	2.1	4.8	2.9	2.1 -	2.9
Airport Total Capacity Ranges:			**39.9 million enplanements**		**13.5 - million international enplanements**	**15.9**

Key Deficiencies:

- Lobby Area (Term 4, 8)
- SSCP Lanes and Area
- Checked Baggage Screening Area
- Secure Area Concessions & Circulation
- Restrooms
- Gates (2015, 2025 Term 1,3,7,8)
- International Baggage Claim (Term 7 & 8)
- Domestic Baggage Claim (Term 7)
- FIS Counter (Term 2/3)

Exhibit 5
LGA – Terminal Capacity Findings

Key Determinants -

Million Annual Enplanements Based on:

	Check-in Positions Dom.	Check-in Positions Int'l	Check-in Positions Combined	SSCP Lanes	Gates	Holdrooms	Capacity Range	
Central Terminal	7.7	0.0	7.7	5.5	10.7	7.3	5.5 -	10.7
Delta / Northwest	4.5	0.0	4.5	2.5	3.2	3.1	2.5 -	4.5
Delta Shuttle	0.9	0.0	0.9	0.5	1.1	0.5	0.5 -	1.1
US Airways	4.4	0.0	4.4	2.6	3.1	4.0	2.6 -	4.4
				Airport Total Capacity Range:			**11.1 -**	**20.7**
							million enplanements	

Secondary Determinants -

Million Annual Enplanements Based on:

	Baggage Claim Dom.	Baggage Claim Int'l	Baggage Claim Combined	Primary Inspection Int'l	Capacity Range International	
Central Terminal	10.3	0.0	10.3	0.0	0.0 -	0.0
Delta / Northwest	3.6	0.0	3.6	0.0	0.0 -	0.0
Delta Shuttle	0.9	0.0	0.9	0.0	0.0 -	0.0
US Airways	3.9	0.0	3.9	0.0	0.0 -	0.0
Airport Total Capacity Ranges:			**18.7 million enplanements**		**0.0 -**	**0.0**
					million international enplanements	

Key Deficiencies:

- Lobby Area
- SSCP Lanes and Area
- Checked Baggage Screening Area
- Secure Area Concessions & Circulation
- Restrooms

Exhibit 6
EWR – Terminal Capacity Findings

Key Determinants -

	Million Annual Enplanements Based on: Check-in Positions Dom.	Int'l	Combined	SSCP Lanes	Gates	Holdrooms	Capacity Range	
Terminal A	6.9	0.2	7.1	3.7	7.3	6.7	3.7 -	7.3
Terminal B	2.6	2.7	5.3	4.6	4.5	3.4	3.4 -	5.3
Terminal C	9.4	4.6	14.0	13.8	12.3	15.5	12.3 -	15.5
Airport Total Capacity Range:							**19.4 -**	**28.1 million enplanements**

Secondary Determinants -

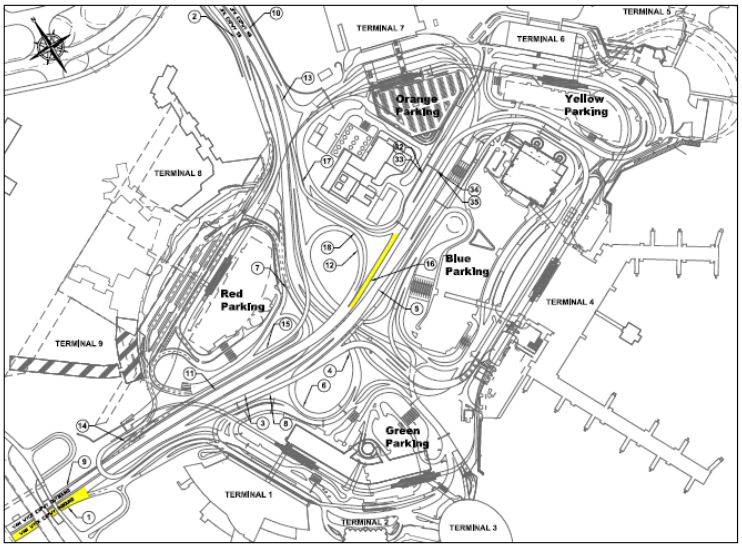
	Million Annual Enplanements Based on: Baggage Claim Dom.	Int'l	Combined	Primary Inspection Int'l	Capacity Range International	
Terminal A	7.0	0.0	7.0	0.0	0.0 -	0.0
Terminal B	3.3	3.2	6.5	4.5	3.2 -	4.5
Terminal C	19.2	3.1	22.3	4.3	3.1 -	4.3
Airport Total Capacity Ranges:			**35.8 million enplanements**		**6.3 -**	**8.8 million international enplanements**

Key Deficiencies:

- Lobby Area
- SSCP Lanes and Area
- Checked Baggage Screening Area
- Secure Area Concessions & Circulation
- Restrooms
- Gates (2015, 2025 Term B & C)
- International Baggage Claim (Term C)

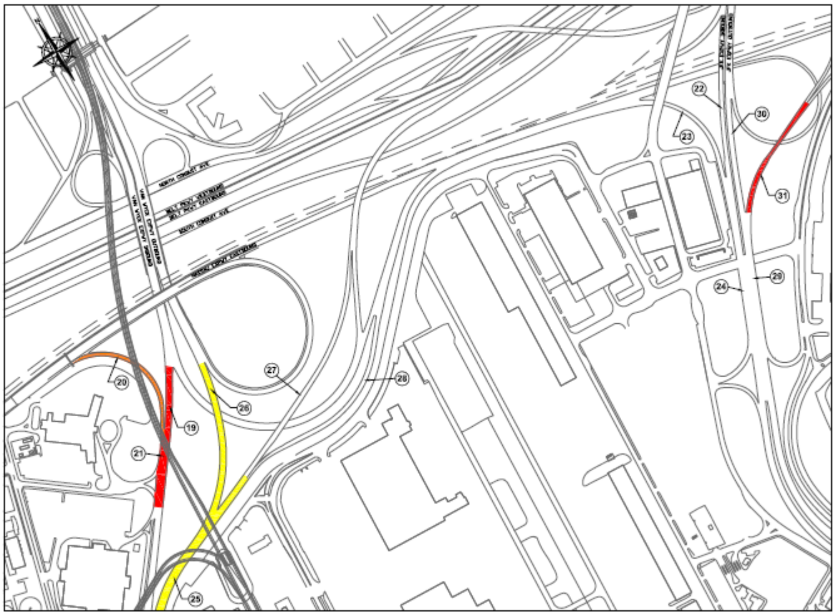
Landside Capacity Analysis

Exhibit 7
JFK - On-Airport Critical Roadway Segments
AM Peak Traffic (Vehicles/Hour)



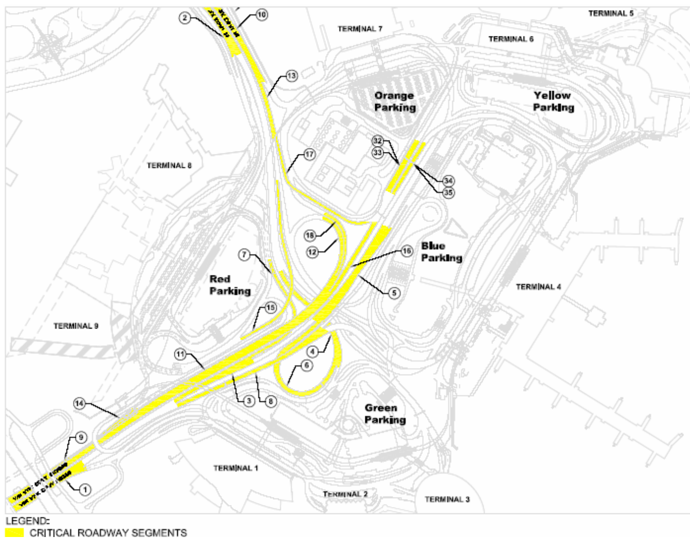
	AIRPORT ROADWAY DESCRIPTION	Base Year 2004 AM Peak Traffic (Vehicles/Hour)	Forecast 2015 AM Peak Traffic (Vehicles/Hour)	Forecast 2025 AM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
INBOUND TO CENTRAL TERMINAL AREA							
1	Van Wyck Expwy (on-airport)	2,880 (≥ C)	3,570 (≥ C)	4,130 (D)	3,900	5,130	6,000
2	JFK Expwy	1,510 (≥ C)	1,940 (≥ C)	2,250 (≥ C)	3,900	5,130	6,000
3	Van Wyck Expwy to Terminals 5-9 and Blue Parking	1,380 (≥ C)	1,970 (≥ C)	2,220 (≥ C)	2,340	3,100	3,800
4	JFK Expwy to Terminals 1-3, 5-7 and Blue Parking	700 (≥ C)	1,050 (≥ C)	1,170 (≥ C)	2,150	2,850	3,500
5	Van Wyck Expwy and JFK Expwy to Terminals 5-7 and Blue Parking	1,280 (≥ C)	2,100 (≥ C)	2,300 (≥ C)	2,925	3,875	4,750
6	JFK Expwy to Terminals 5-7 and Blue Parking via Loop Ramp	520 (≥ C)	530 (≥ C)	580 (≥ C)	810	1,070	1,250
7	Van Wyck Expwy to Terminals 8 and 9	680 (≥ C)	740 (≥ C)	870 (≥ C)	1,170	1,550	1,900
8	Van Wyck Expwy to Terminal 4	590 (≥ C)	680 (≥ C)	860 (≥ C)	2,340	3,100	3,800
OUTBOUND FROM CENTRAL TERMINAL AREA							
9	Van Wyck Expwy (on-airport)	1,530 (≥ C)	2,340 (≥ C)	2,710 (≥ C)	3,900	5,130	6,000
10	JFK Expwy	1,760 (≥ C)	2,460 (≥ C)	2,850 (≥ C)	3,900	5,130	6,000
11	Terminals 1-7 to Van Wyck Expwy (Main)	1,180 (≥ C)	1,700 (≥ C)	1,960 (≥ C)	3,900	5,130	6,000
12	Terminals 1-3 and Blue Parking to Van Wyck Expwy via Loop Ramp	620 (≥ C)	1,110 (≥ C)	1,270 (≥ C)	1,620	2,140	2,500
13	Terminals 1-6, 8 and 9 to JFK Expwy	1,190 (≥ C)	1,880 (≥ C)	2,170 (≥ C)	2,600	3,420	4,000
14	Terminals 8 and 9 to Van Wyck Expwy	370 (≥ C)	610 (≥ C)	720 (≥ C)	1,170	1,550	1,900
15	Terminals 8 and 9 to JFK Expwy	790 (≥ C)	830 (≥ C)	980 (≥ C)	1,170	1,550	1,900
16	Terminals 4-6 to Van Wyck Expwy	680 (≥ C)	1,090 (≥ C)	1,260 (D)	1,170	1,550	1,900
17	Terminals 4-6 to JFK Expwy	460 (≥ C)	880 (≥ C)	1,010 (≥ C)	1,170	1,550	1,900
18	Terminal 7 to Van Wyck Expwy	290 (≥ C)	270 (≥ C)	320 (≥ C)	1,170	1,550	1,900

Exhibit 8
JFK - On-Airport Critical Roadway Segments
AM Peak Traffic (Vehicles/Hour)



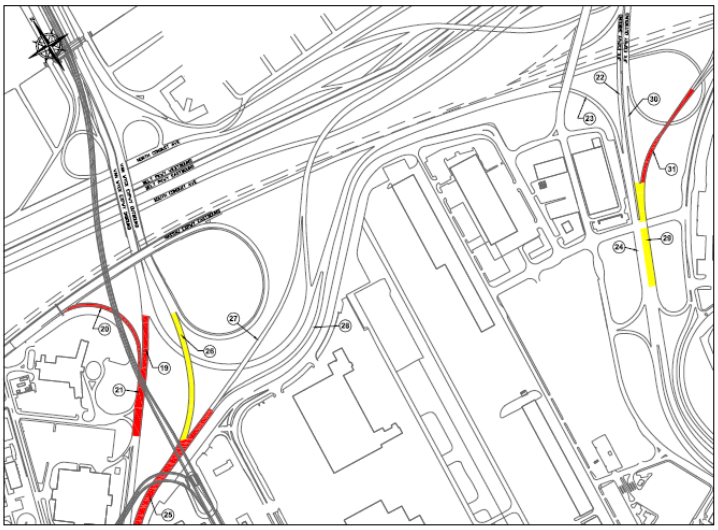
AIRPORT ROADWAY DESCRIPTION		Base Year 2004 AM Peak Traffic (Vehicles/Hour)	Forecast 2015 AM Peak Traffic (Vehicles/Hour)	Forecast 2025 AM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
AIRPORT ENTRANCES							
19	Ramp from Van Wyck Expwy (off-airport)	3,380 (D)	4,190 (F)	4,850 (F)	2,600	3,420	4,000
20	Ramp from Nassau Expwy E/B	1,110 (? C)	1,380 (D)	1,590 (E)	1,170	1,550	1,900
21	Van Wyck Expwy (on-airport)	4,490 (? C)	5,570 (E)	6,440 (F)	4,500	5,340	6,000
22	Ramp from Belt Pkwy W/B	1,650 (? C)	2,120 (? C)	2,460 (? C)	2,600	3,420	4,000
23	Ramp from Nassau Expwy E/B	500 (? C)	640 (? C)	750 (? C)	1,170	1,550	1,900
24	JFK Expwy	2,150 (? C)	2,760 (? C)	3,210 (? C)	3,900	5,130	6,000
AIRPORT EXITS							
25	Van Wyck Expwy (on-airport)	2,570 (? C)	3,930 (? C)	4,550 (D)	4,500	5,340	6,000
26	Ramp to Van Wyck Expwy (off-airport)	2,030 (? C)	3,100 (D)	3,600 (D)	2,925	3,875	4,750
27	Ramp to Belt Pkwy E/B	340 (? C)	520 (? C)	600 (? C)	1,300	1,710	2,000
28	Ramp to Nassau Expwy E/B	200 (? C)	310 (? C)	350 (? C)	1,170	1,550	1,900
29	JFK Expwy	1,740 (? C)	2,430 (? C)	2,820 (? C)	3,900	5,130	6,000
30	Ramp to Belt Pkwy E/B	530 (? C)	740 (? C)	860 (? C)	2,600	3,420	4,000
31	Ramp to N. Conduit Ave. and Nassau Expwy E/B	1,210 (D)	1,690 (E)	1,960 (F)	1,170	1,550	1,900
CTA RAMPS FROM TERMINALS 4/5/6							
32	Terminals 5 and 6 to JFK Expwy	410 (? C)	740 (? C)	790 (? C)	1,170	1,550	1,900
33	Terminals 5 and 6 to Van Wyck Expwy	560 (? C)	920 (? C)	980 (? C)	2,340	3,100	3,800
34	Terminal 4 to JFK Expwy	220 (? C)	330 (? C)	420 (? C)	1,170	1,550	1,900
35	Terminal 4 to Van Wyck Expwy	320 (? C)	390 (? C)	490 (? C)	2,340	3,100	3,800

Exhibit 9
JFK - On-Airport Critical Roadway Segments
PM Peak Traffic (Vehicles/Hour)



AIRPORT ROADWAY DESCRIPTION		Base Year 2004 PM Peak Traffic (Vehicles/Hour)	Forecast 2015 PM Peak Traffic (Vehicles/Hour)	Forecast 2025 PM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
INBOUND TO CENTRAL TERMINAL AREA							
1	Van Wyck Expwy (on-airport)	3,560 (≥ C)	4,220 (D)	4,890 (D)	3,900	5,130	6,000
2	JFK Expwy	2,160 (≥ C)	2,490 (≥ C)	2,880 (≥ C)	3,900	5,130	6,000
3	Van Wyck Expwy to Terminals 5-9 and Blue Parking	1,980 (≥ C)	2,510 (D)	2,830 (D)	2,340	3,100	3,800
4	JFK Expwy to Terminals 1-3, 5-7 and Blue Parking	1,320 (≥ C)	1,510 (≥ C)	1,680 (≥ C)	2,150	2,850	3,500
5	Van Wyck Expwy and JFK Expwy to Terminals 5-7 and Blue Parking	1,830 (≥ C)	2,400 (≥ C)	2,630 (≥ C)	2,925	3,875	4,750
6	JFK Expwy to Terminals 5-7 and Blue Parking via Loop Ramp	660 (≥ C)	670 (≥ C)	740 (≥ C)	810	1,070	1,250
7	Van Wyck Expwy to Terminals 8 and 9	830 (≥ C)	1,020 (≥ C)	1,200 (D)	1,170	1,550	1,900
8	Van Wyck Expwy to Terminal 4	570 (≥ C)	780 (≥ C)	990 (≥ C)	2,340	3,100	3,800
OUTBOUND FROM CENTRAL TERMINAL AREA							
9	Van Wyck Expwy (on-airport)	3,060 (≥ C)	3,470 (≥ C)	4,020 (D)	3,900	5,130	6,000
10	JFK Expwy	3,010 (≥ C)	3,410 (≥ C)	3,950 (D)	3,900	5,130	6,000
11	Terminals 1-7 to Van Wyck Expwy (Main)	2,570 (≥ C)	2,770 (≥ C)	3,190 (≥ C)	3,900	5,130	6,000
12	Terminals 1-3 and Blue Parking to Van Wyck Expwy via Loop Ramp	1,640 (D)	1,850 (D)	2,120 (D)	1,620	2,140	2,500
13	Terminals 1-6, 8 and 9 to JFK Expwy	2,130 (≥ C)	2,540 (≥ C)	2,940 (D)	2,600	3,420	4,000
14	Terminals 8 and 9 to Van Wyck Expwy	540 (≥ C)	590 (≥ C)	690 (≥ C)	1,170	1,550	1,900
15	Terminals 8 and 9 to JFK Expwy	1,140 (≥ C)	1,290 (D)	1,520 (D)	1,170	1,550	1,900
16	Terminals 4-6 to Van Wyck Expwy	660 (≥ C)	950 (≥ C)	1,090 (≥ C)	1,170	1,550	1,900
17	Terminals 4-6 to JFK Expwy	540 (≥ C)	810 (≥ C)	930 (≥ C)	1,170	1,550	1,900
18	Terminal 7 to Van Wyck Expwy	480 (≥ C)	450 (≥ C)	530 (≥ C)	1,170	1,550	1,900

Exhibit 10
JFK - On-Airport Critical Roadway Segments
PM Peak Traffic (Vehicles/Hour)



AIRPORT ROADWAY DESCRIPTION		Base Year 2004 PM Peak Traffic (Vehicles/Hour)	Forecast 2015 PM Peak Traffic (Vehicles/Hour)	Forecast 2025 PM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
OFF-AIRPORT ENTRANCES							
19	Ramp from Van Wyck Expwy (off-airport)	4,270 (F)	5,060 (F)	5,870 (F)	2,600	3,420	4,000
20	Ramp from Nassau Expwy E/B	1,640 (E)	1,940 (F)	2,250 (F)	1,170	1,550	1,900
21	Van Wyck Expwy (on-airport)	5,910 (E)	7,000 (F)	8,120 (F)	4,500	5,340	6,000
22	Ramp from Belt Pkwy W/B	1,560 (≥ C)	1,800 (≥ C)	2,080 (≥ C)	2,600	3,420	4,000
23	Ramp from Nassau Expwy E/B	370 (≥ C)	430 (≥ C)	490 (≥ C)	1,170	1,550	1,900
24	JFK Expwy	1,930 (≥ C)	2,230 (≥ C)	2,570 (≥ C)	3,900	5,130	6,000
OFF-AIRPORT EXITS							
25	Van Wyck Expwy (on-airport)	4,600 (D)	5,220 (D)	6,040 (F)	4,500	5,340	6,000
26	Ramp to Van Wyck Expwy (off-airport)	3,420 (≥ C)	3,880 (D)	4,490 (D)	3,510	4,650	5,700
27	Ramp to Belt Pkwy E/B	910 (≥ C)	1,030 (≥ C)	1,200 (≥ C)	1,300	1,710	2,000
28	Ramp to Nassau Expwy E/B	270 (≥ C)	310 (≥ C)	350 (≥ C)	1,170	1,550	1,900
29	JFK Expwy	3,600 (≥ C)	4,070 (D)	4,720 (D)	3,900	5,130	6,000
30	Ramp to Belt Pkwy E/B	1,230 (≥ C)	1,390 (≥ C)	1,610 (≥ C)	2,600	3,420	4,000
31	Ramp to N. Conduit Ave. and Nassau Expwy E/B	2,370 (F)	2,680 (F)	3,110 (F)	1,170	1,550	1,900
CTA RAMPS FROM TERMINALS 4/5/6							
32	Terminals 5 and 6 to JFK Expwy	420 (≥ C)	650 (≥ C)	700 (≥ C)	1,170	1,550	1,900
33	Terminals 5 and 6 to Van Wyck Expwy	480 (≥ C)	760 (≥ C)	810 (≥ C)	2,340	3,100	3,800
34	Terminal 4 to JFK Expwy	550 (≥ C)	560 (≥ C)	710 (≥ C)	1,170	1,550	1,900
35	Terminal 4 to Van Wyck Expwy	620 (≥ C)	630 (≥ C)	800 (≥ C)	2,340	3,100	3,800

Exhibit 11
JFK – Terminal Frontage Curb Capacity Summary

Frontage Curb	Available Curb (feet)					
	Terminal 1	**Terminal 2/3**	**Terminal 4**	**Terminal 6***	**Terminal 7**	**Terminal 8/9****
Arrivals						
Car/Limo/Car Service	87	639	904	610 (640)	554	1106 (856)
Taxi	296	451	575	96 (220)	351	516 (306)
Shared Ride/Shuttle	---	---	---	---	---	150 (0)
Bus	501	869	890	---	315	447 (370)
Total	**884**	**1959**	**2369**	**706 (860)**	**1220**	**2219 (1532)**
Departures						
Car/Limo/Taxi	613	1160	1698	756 (1040)	281	2190 (1812)
Shared Ride/Shuttle	---	---	---	---	---	---
Bus	---	96	---	118 (0)	351	---
Total	**613**	**1256**	**1698**	**874 (1040)**	**632**	**2190 (1812)**

Notes:
* Numbers in parentheses represent permanent Jetblue frontage curb available in the proposed Terminal 5 redevelopment plan.
** Numbers in parentheses represent permanent American Airlines frontage curb available in the proposed Terminal 8 redevelopment plan.

	Arrivals		Departures	
Terminal	**2004**	**2015/2025**	**2004**	**2015/2025**
1	3:30 PM	3:30 PM	3:40 PM	3:10 PM
2/3	4:10 PM	4:10 PM	4:10 PM	4:00 PM
4	3:20 PM	2:40 PM	4:00 PM	4:00 PM
5/6	2:20 PM	7:10 PM	6:40 AM	7:50 AM
7	4:10 PM	7:40 PM	4:00 PM	5:00 PM
8/9	7:30 PM	3:50 PM	6:10 AM	6:10 AM

Exhibit 12
JFK – Terminal Frontage Analysis Summary

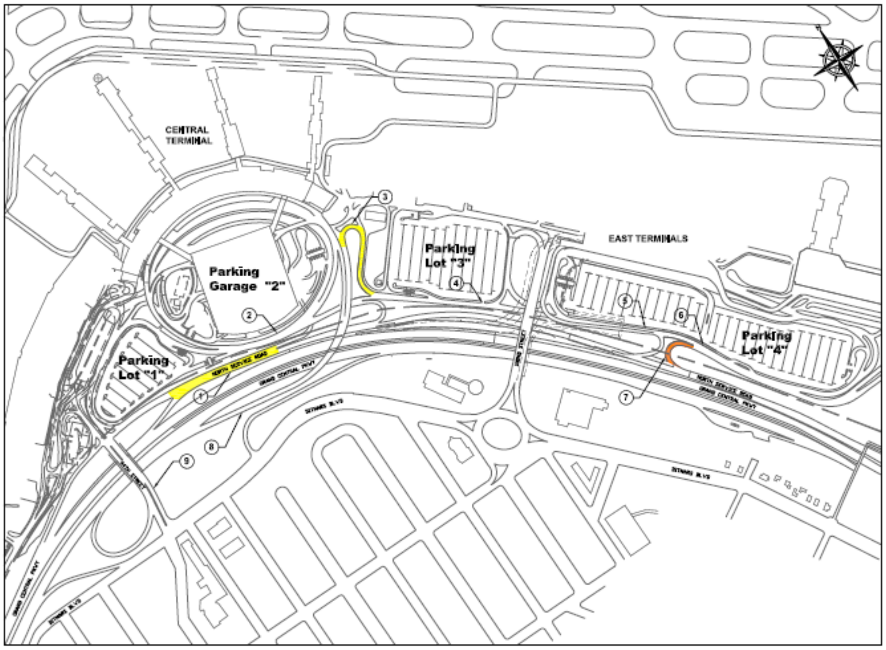
Terminal	Frontage Road	Available Frontage (feet)			Required Frontage (80%) (feet)			Surplus (Deficit) (feet)		
		2004	2015	2025	2004	2015	2025	2004	2015	2025
	Cars	87	87	87	225	200	250	(138)	(113)	(163)
	Taxis	296	296	296	15	15	15	281	281	281
	Limo/Shuttles	0	0	0	140	220	220	(140)	(220)	(220)
	Buses	501	501	501	0	0	0	501	501	501
1	**Arrivals**	**884**	**884**	**884**	380	435	485	504	449	399
	Car/Taxi/Limo/Bus	613	613	613	358	410	513	255	203	100
	Limo/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures	**613**	**613**	**613**	358	410	513	255	203	100
	Cars	639	639	639	375	400	400	264	239	239
	Taxis	451	451	451	26	26	26	425	425	425
	Limo/Shuttles	0	0	0	315	295	295	(315)	(295)	(295)
	Buses	869	869	869	55	55	55	814	814	814
2/3	**Arrivals**	**1959**	**1959**	**1959**	751	776	776	1,208	1,183	1,183
	Cars/Taxis	1160	1160	1160	450	525	525	710	635	635
	Limo/Shuttles	0	0	0	205	245	245	(205)	(245)	(245)
	Buses	96	96	96	0	0	0	96	96	96
	Departures	**1256**	**1256**	**1256**	655	770	770	601	486	486
	Cars	904	904	904	350	350	425	554	554	479
	Taxis	575	575	575	19	19	26	556	556	549
	Limo/Shuttles	0	0	0	205	245	295	(205)	(245)	(295)
	Buses	890	890	890	55	55	55	835	835	835
4	**Arrivals**	**2369**	**2369**	**2369**	629	669	801	1,740	1,700	1,568
	Car/Taxi/Limo/Bus	1698	1698	1698	435	462	564	1,263	1,236	1,134
	Limo/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures	**1698**	**1698**	**1698**	435	462	564	1,263	1,236	1,134
	Cars	672	672	672	200	275	275	472	397	397
	Taxis	100	220	220	11	11	11	89	209	209
	Limo/Shuttles	0	0	0	180	245	295	(180)	(245)	(295)
	Buses	0	0	0	0	55	55	0	(55)	(55)
5/6	**Arrivals**	**772**	**860**	**860**	391	586	636	381	274	224
	Car/Taxi/Limo/Bus	756	1040	1040	300	795	946	456	245	94
	Limo/Shuttles	0	0	0	205	0	0	(205)	0	0
	Buses	118	0	0	0	0	0	118	0	0
	Departures	**874**	**1040**	**1040**	505	975	1,025	369	65	15
	Cars	554	554	554	225	250	275	329	304	279
	Taxis	351	351	351	11	15	15	340	336	336
	Limo/Shuttles	0	0	0	180	220	220	(180)	(220)	(220)
	Buses	315	315	315	55	55	55	260	260	260
7	**Arrivals**	**1220**	**1220**	**1220**	471	540	565	749	680	655
	Cars/Taxis	281	281	281	300	325	350	(19)	(44)	(69)
	Limo/Shuttles	0	0	0	140	180	220	(140)	(180)	(220)
	Buses	351	351	351	55	55	55	296	296	296
	Departures	**632**	**632**	**632**	495	560	625	137	72	7
	Cars	1106	856	856	500	525	550	606	331	306
	Taxis	516	306	306	11	11	15	505	295	291
	Limo/Shuttles	150	0	0	345	375	395	(195)	(375)	(395)
	Buses	447	370	370	55	55	55	392	315	315
	Arrivals	**2219**	**1532**	**1532**	911	961	1,015	1,308	571	517
	Car/Taxi/Limo/Bus	1174	798	798	538	590	667	636	208	131
8/9	Limo/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures (Inner)	**1174**	**798**	**798**	538	590	667	636	208	131
	Car/Taxi/Limo/Bus	1016	1014	1014	0	0	0	1,016	1,014	1,014
	Limo/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures (Outer)	**1016**	**1014**	**1014**	0	0	0	1016	1014	1014

Notes:
* Numbers in parentheses represent permanent jetBlue frontage curb available in the proposed Terminal 5 redevelopment plan.
* Numbers in parentheses represent permanent American Airlines frontage curb available in the proposed Terminal 8 redevelopment plan.

Exhibit 13
JFK Airport Parking Summary

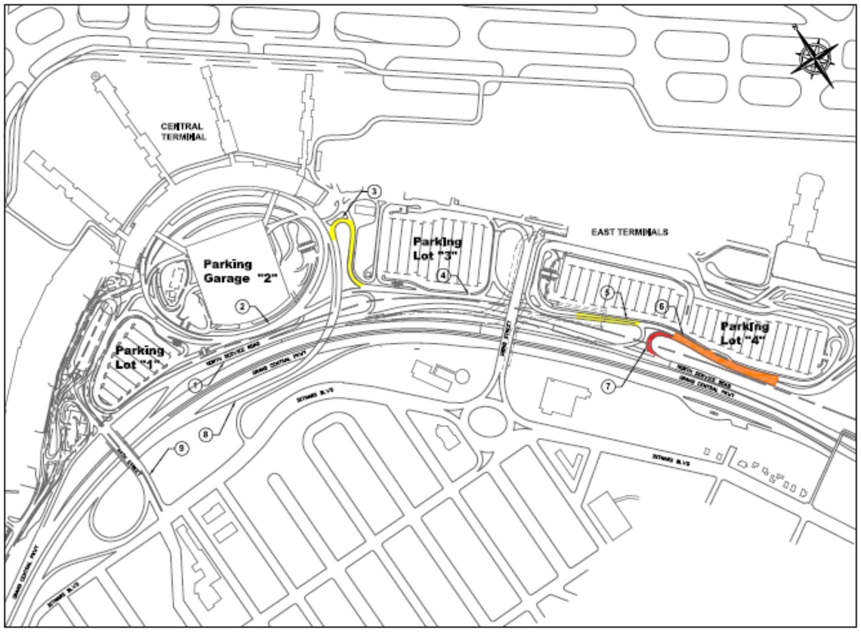
Parking		Terminal	Supply			Parking Occupancy			Surplus (Deficit)		
Lot	Color		2004	2015	2025	2004	2015	2025	2004	2015	2025
1	Green	Terminals 1 and 2/3	1,617	1,617	1,617	1,180	1,478	1,655	437	139	(38)
2	Blue	Terminal 4	2,121	2,121	2,121	1,315	1,778	2,246	806	343	(125)
3	Red	Terminals 8/9 (American Airlines)	---	1,940	1,940	Closed	576	677	---	1,364	1,263
4	Yellow	Terminal 5 (closed), Terminal 6	460	1,500	1,500	460	797	853	0	703	647
5	Orange	Terminal 7 Garage	723	723	723	484	549	642	239	174	81
		SUB-TOTAL (CTA)	4,911	7,901	7,901	3,429	5,178	6,073	1,482	2,723	1,828
7		Long-Term Parking Overflow 1	1,460	1,460	1,460	0	0	0	1,460	1,460	1,460
7A		Long-Term Parking Overflow 2	435	435	435	0	0	0	435	435	435
7B	Bldg. 208	Long-Term Parking Overflow 3	900	---	---	0	0	0	900	---	---
9		Long-Term Parking	6,561	6,561	6,561	4,761	6,435	7,356	1,800	126	(795)
-	Hangar 12	Terminals 8/9 Temporary Hourly	994	---	---	487	---	---	507	---	---
		SUB-TOTAL	10,350	8,456	8,456	5,248	6,435	7,356	5,102	2,021	1,100
6		Employee Parking	1,702	1,702	1,702	1,617	2,185	2,498	85	(483)	(796)
		TOTAL (JFK)	16,963	18,059	18,059	10,294	13,798	15,927	6,669	4,261	2,132

Exhibit 14
LGA - On-Airport Critical Roadway Segments
AM Peak Traffic (Vehicles/Hour)



AIRPORT ROADWAY DESCRIPTION		Base Year 2004 AM Peak Traffic (Vehicles/Hour)	Forecast 2015 AM Peak Traffic (Vehicles/Hour)	Forecast 2025 AM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	Level of Service Thresholds LOS "D" (Vehicles/Hour)	Level of Service Thresholds LOS "E" (Vehicles/Hour)
1	North Service Road and CTB Parking Exit Weave	2,670 (≥ C)	3,200 (D)	3,620 (D)	2,925	3,875	4,750
2	To CTB, East Terminals and CTB Recirculation Weave	1,500 (≥ C)	1,630 (≥ C)	1,830 (≥ C)	2,925	3,875	4,750
3	Loop Ramp to East Terminals	790 (≥ C)	910 (D)	990 (D)	810	1,070	1,250
4	Parking Lot 3 Exit and La Guardia Road Merge	1,470 (≥ C)	1,660 (≥ C)	1,850 (≥ C)	2,340	3,100	3,800
5	East Terminals Recirculating Road	1,640 (≥ C)	2,030 (≥ C)	2,210 (≥ C)	2,925	3,875	4,750
6	Weaving Segment to Delta Terminal	1,930 (≥ C)	2,310 (≥ C)	2,520 (≥ C)	2,925	3,875	4,750
7	Grand Central Parkway Westbound	810 (D)	920 (D)	1,000 (E)	800	950	1,100
8	Grand Central Parkway Eastbound	1,130 (≥ C)	1,530 (≥ C)	1,720 (≥ C)	2,150	2,850	3,500
9	94th Street	490 (≥ C)	650 (≥ C)	730 (≥ C)	1,200	1,400	1,600

Exhibit 15
LGA - On-Airport Critical Roadway Segments
PM Peak Traffic (Vehicles/Hour)



AIRPORT ROADWAY DESCRIPTION		Base Year 2004 PM Peak Traffic (Vehicles/Hour)	Forecast 2015 PM Peak Traffic (Vehicles/Hour)	Forecast 2025 PM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds		
					LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
1	North Service Road and CTB Parking Exit Weave	2,170 (≥ C)	2,540 (≥ C)	2,870 (≥ C)	2,925	3,875	4,750
2	To CTB, East Terminals and CTB Recirculation Weave	1,750 (≥ C)	1,690 (≥ C)	1,900 (≥ C)	2,925	3,875	4,750
3	Loop Ramp to East Terminals	840 (D)	950 (D)	1,040 (D)	810	1,070	1,250
4	Parking Lot 3 Exit and La Guardia Road Merge	1,670 (≥ C)	1,920 (≥ C)	2,140 (≥ C)	2,340	3,100	3,800
5	East Terminals Recirculating Road	2,650 (≥ C)	3,280 (D)	3,580 (D)	2,925	3,875	4,750
6	Weaving Segment to Delta Terminal	3,070 (D)	3,610 (D)	3,940 (E)	2,925	3,875	4,750
7	Grand Central Parkway Westbound	1,100 (E)	1,260 (F)	1,370 (F)	800	950	1,100
8	Grand Central Parkway Eastbound	1,520 (≥ C)	1,860 (≥ C)	2,090 (≥ C)	2,150	2,850	3,500
9	94th Street	670 (≥ C)	870 (≥ C)	980 (≥ C)	1,200	1,400	1,600

Exhibit 16
LGA Airport Frontage Curb Capacity Summary

Frontage Curb	Available Curb (feet)			
	Terminal A *	**Terminal B**	**Terminal C**	**Terminal D**
Arrivals				
Car/Limo/Car Service	432	568	505	623
Taxi	245	308	417	---
Shared Ride/Shuttles	144	200	121	36
Bus	156	295	276	340
Total		**1371**	**1319**	**999**
Departures				
Car/Limo/Taxi	---	1522	498	656
Shared Ride/Shuttles	---	---	244	---
Bus	---	---	76	41
Total	**977**	**1522**	**818**	**697**

* Terminal A frontage is used for both arrivals and departures passengers.

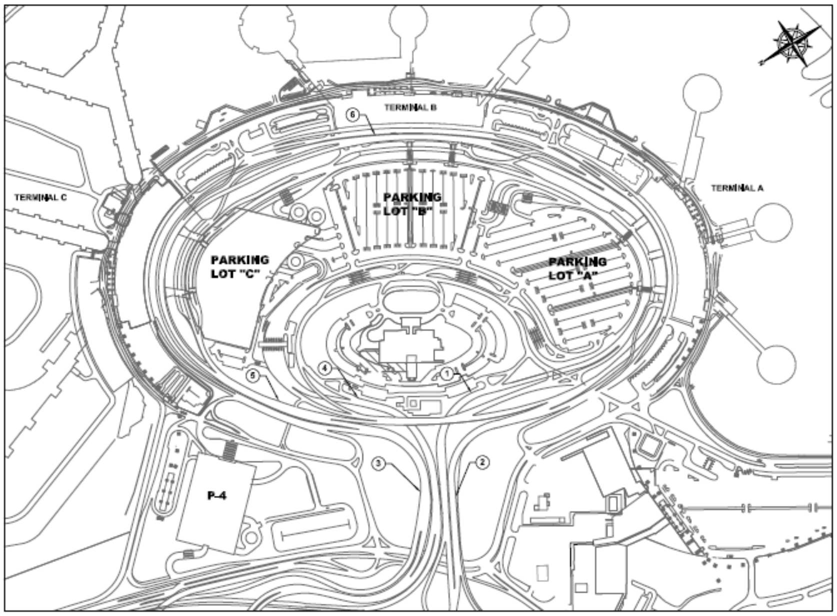
Exhibit 17
LGA -Airport Parking Summary

Parking		Terminal	Supply			Parking Occupancy			Surplus (Deficit)		
Lot	Color		2004	2015	2025	2004	2015	2025	2004	2015	2025
1		Terminal B Daily Parking	397	397	397	111	136	154	286	261	243
2		Terminal B Daily Parking Garage	2,902	2,902	2,902	1,973	2,409	2,736	929	493	166
3		Long-Term Parking	925	925	925	925	1,065	1,185	0	(140)	(260)
4		Terminal C Daily Parking	1,381	1,381	1,381	1,174	1,153	1,223	207	228	158
5		Terminal D Daily Parking	857	857	857	677	785	866	180	72	(9)
6		Terminal A Daily Parking	177	177	177	152	171	191	25	6	(14)
7		Terminal A Daily Parking	270	270	270	84	94	105	186	176	165
		SUB-TOTAL	**6,909**	**6,909**	**6,909**	**5,096**	**5,813**	**6,460**	**1,813**	**1,096**	**449**
10E		Employee Parking (Marine Air)	2,236	2,236	2,236	1,744	2,007	2,234	492	229	2
		TOTAL (LGA)	**9,145**	**9,145**	**9,145**	**6,840**	**7,820**	**8,694**	**2,305**	**1,325**	**451**

Exhibit 18
LGA Airport Frontage Analysis Summary

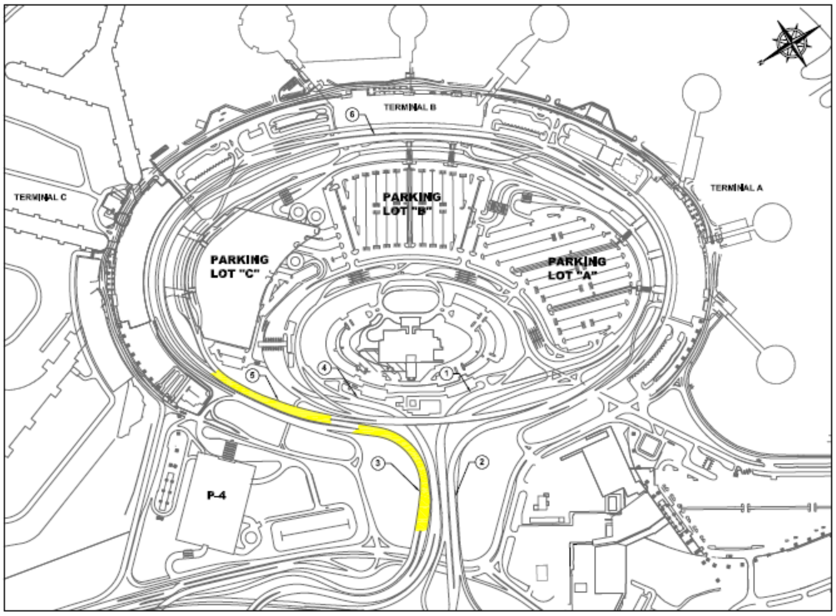
Terminal	Frontage Road	Available Frontage (feet)			Required Frontage (80%) (feet)			Surplus (Deficit) (feet)		
		2004	2015	2025	2004	2015	2025	2004	2015	2025
A	Cars/Limos/Car Service	432	432	432	400	400	500	32	32	(68)
	Taxis	245	245	245	75	100	100	170	145	145
	Shared Ride/Shuttles	144	144	144	120	120	160	24	24	(16)
	Buses	156	156	156	55	110	110	101	46	46
	Arrivals/Departures	**977**	**977**	**977**	**650**	**730**	**870**	**327**	**247**	**107**
B	Cars/Limos/Car Service	568	568	568	1200	1525	1700	(632)	(957)	(1132)
	Taxis	308	308	308	125	175	175	183	133	133
	Shared Ride/Shuttles	200	200	200	200	280	320	0	(80)	(120)
	Buses	295	295	295	110	110	110	185	185	185
	Arrivals	**1371**	**1371**	**1371**	**1635**	**2090**	**2305**	**(264)**	**(719)**	**(934)**
	Cars/Taxis	1522	1522	1522	610	795	875	912	727	647
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures	**1522**	**1522**	**1522**	**610**	**795**	**875**	**912**	**727**	**647**
C	Cars/Limos/Car Service	505	505	505	550	500	550	(45)	5	(45)
	Taxis	417	417	417	75	75	75	342	342	342
	Shared Ride/Shuttles	121	121	121	120	120	120	1	1	1
	Buses	276	276	276	55	55	55	221	221	221
	Arrivals	**1319**	**1319**	**1319**	**250**	**250**	**250**	**564**	**564**	**564**
	Cars/Taxis	498	498	498	325	300	300	173	198	198
	Shared Ride/Shuttles	244	244	244	80	80	80	164	164	164
	Buses	76	76	76	55	55	55	21	21	21
	Departures	**818**	**818**	**818**	**460**	**435**	**435**	**358**	**383**	**383**
D	Cars/Limos/Car Service	623	623	623	650	700	750	(27)	(77)	(127)
	Taxis	0	0	0	75	100	100	(75)	(100)	(100)
	Shared Ride/Shuttles	36	36	36	160	160	160	(124)	(124)	(124)
	Buses	340	340	340	55	55	55	285	285	285
	Arrivals	**999**	**999**	**999**	**940**	**1015**	**1065**	**59**	**(16)**	**(66)**
	Cars/Taxis	656	656	656	325	475	475	331	181	181
	Shared Ride/Shuttles	0	0	0	80	80	120	(80)	(80)	(120)
	Buses	41	41	41	55	55	55	(14)	(14)	(14)
	Departures	**697**	**697**	**697**	**460**	**610**	**650**	**237**	**87**	**47**

Exhibit 19
EWR - On-Airport Critical Roadway Segments
AM Peak Traffic (Vehicles/Hour)



	AIRPORT ROADWAY DESCRIPTION	Base Year 2004 AM Peak Traffic (Vehicles/Hour)	Forecast 2015 AM Peak Traffic (Vehicles/Hour)	Forecast 2025 AM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
1	Airport Entrance to Arrivals Level	460 (≥ C)	970 (≥ C)	1,180 (≥ C)	2,340	3,100	3,800
2	Airport Entrance to Departures Level	2,060 (≥ C)	2,630 (≥ C)	3,220 (≥ C)	3,510	4,650	5,700
3	Airport Exit from all Terminals and P-4	1,840 (≥ C)	2,630 (≥ C)	3,210 (≥ C)	3,510	4,650	5,700
4	Airport Exit from all Parking and Tower Road	360 (≥ C)	760 (≥ C)	930 (≥ C)	3,510	4,650	5,700
5	From Terminals A, B and Terminal C Arrivals to Recirculation and Airport Exit	1,890 (≥ C)	2,740 (≥ C)	3,340 (≥ C)	3,510	4,650	5,700
6	To Terminal C Departures Level and from Terminal A Departures Level	1,210 (≥ C)	1,810 (≥ C)	2,210 (≥ C)	2,925	3,875	4,750

Exhibit 20
EWR On-Airport Critical Roadway Segments
PM Peak Traffic (Vehicles/Hour)



AIRPORT ROADWAY DESCRIPTION		Base Year 2004 PM Peak Traffic (Vehicles/Hour)	Forecast 2015 PM Peak Traffic (Vehicles/Hour)	Forecast 2025 PM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
1	Airport Entrance to Arrivals Level	780 (≥ C)	1,200 (≥ C)	1,460 (≥ C)	2,340	3,100	3,800
2	Airport Entrance to Departures Level	2,170 (≥ C)	2,760 (≥ C)	3,370 (≥ C)	3,510	4,650	5,700
3	Airport Exit from all Terminals and P-4	2,090 (≥ C)	2,910 (≥ C)	3,550 (D)	3,510	4,650	5,700
4	Airport Exit from all Parking and Tower Road	1,180 (≥ C)	1,460 (≥ C)	1,780 (≥ C)	3,510	4,650	5,700
5	From Terminals A, B and Terminal C Arrivals to Recirculation and Airport Exit	2,760 (≥ C)	3,610 (D)	4,410 (D)	3,510	4,650	5,700
6	To Terminal C Departures Level and from Terminal A Departures Level	1,320 (≥ C)	2,000 (≥ C)	2,440 (≥ C)	2,925	3,875	4,750

Exhibit 21
EWR Airport Frontage Curb Capacity Summary

Frontage Curb	Available Curb (feet)		
	Terminal A *	Terminal B **	Terminal C ***
At-Grade HOV			
Shared Ride/Shuttle	535	219 (350)	75
Bus	---	327 (550)	294 (344)
Total	**535**	**546 (900)**	---
At-Grade Arrivals			
Car	---	(864)	634 (694)
Taxi	---	(360)	365
Shared Ride/Shuttle	---	---	143
Bus	---	---	---
Total	**0**	**(1224)**	**1561 (1621)**
Mid-Level Departures	**Arrivals**		**Domestic**
Car	526	609 (767)	1149
Taxi	144	158 (0)	---
Shared Ride/Shuttles	---	---	---
Bus	---	---	---
Total	**670**	**767 (767)**	**1149**
Departures (Upper)			**International**
Car	771	806	758
Shared Ride/Shuttles	---	---	---
Bus	---	---	---
Total	**771**	**806**	**758**

* Mid-level frontage roadway of Terminal B is currently designated for Arrival passengers.
** Numbers in parentheses reflect proposed curb frontage available upon completion of the Terminal B Modernization Program.
*** Numbers in parentheses represent additional 60' passenger car space and 50' bus stop that could be extended on the existing Terminal C Arrivals Roadway under current 2004 conditions.

Exhibit 22
EWR Airport Parking Summary

Parking		Terminal	Supply			Parking Occupancy			Surplus (Deficit)		
Lot	Color		2004	2015	2025	2004	2015	2025	2004	2015	2025
A-B-C		Terminal Short-Term Parking	6,554	6,554	6,554	3,277	4,227	5,159	3,277	2,327	1,395
P1-P3		Daily Parking	3,714	3,714	3,714	2,748	3,545	4,327	966	169	(613)
P4		Daily Parking Garage	2,994	2,994	2,994	2,877	3,712	4,530	117	(718)	(1,536)
P6		Economy Parking	4,579	4,579	4,579	4,579	5,907	7,209	0	(1,328)	(2,630)
P7		Economy Parking	1,076	1,076	1,076	979	1,263	1,542	97	(187)	(466)
P4		Valet (P4 Level 1 & Outer Lot)	721	721	721	447	577	704	274	144	17
		SUB-TOTAL	19,638	19,638	19,638	14,907	19,231	23,471	4,731	407	(3833)
P8		Employee Parking (Lot F)	2,896	2,896	2,896	2,751	3,549	4,331	145	(653)	(1435)
		TOTAL (EWR)	22,534	22,534	22,534	17,658	22,780	27,802	4,876	(246)	(5268)

Exhibit 23
EWR Airport Frontage Analysis Summary

Terminal	Frontage Road	Available Frontage (feet)			Required Frontage (80%) (feet)			Surplus (Deficit) (feet)		
		2004	2015	2025	2004	2015	2025	2004	2015	2025
	Shared Ride/Shuttles	535	535	535	120	160	160	415	375	375
	Buses	0	0	0	0	0	0	0	0	0
	At-Grade HOV	**535**	**535**	**535**	**120**	**160**	**160**	**415**	**375**	**375**
	Cars/Limos/Car Service	526	526	526	725	925	1050	(199)	(399)	(524)
	Taxis	144	144	144	75	100	100	69	44	44
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
A	Buses	0	0	0	55	110	110	(55)	(110)	(110)
	Arrivals	**670**	**670**	**670**	**855**	**1135**	**1260**	**(185)**	**(465)**	**(590)**
	Car/Taxi/Limo/Bus	771	771	771	813	1220	1382	(42)	(449)	(611)
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures	**771**	**771**	**771**	**813**	**1220**	**1382**	**(42)**	**(449)**	**(611)**
	Shared Ride/Shuttles	219	350	350	160	200	280	59	150	70
	Buses	327	550	550	55	55	110	272	495	440
	At-Grade HOV	**546**	**900**	**900**	**215**	**255**	**390**	**331**	**645**	**510**
	Cars/Limos/Car Service	0	864	864	0	825	1050	0	39	(186)
	Taxis	0	360	360	0	150	175	0	210	185
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	At-Grade Arrivals	**0**	**1224**	**1224**	**0**	**975**	**1225**	**0**	**249**	**(1)**
	Cars/Limos/Car Service	609	767	767	725	369	365	(116)	398	402
B	Taxis	158	0	0	100	0	0	58	0	0
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures (Domestic)	**767**	**767**	**767**	**825**	**369**	**365**	**(58)**	**398**	**402**
	Cars/Limos/Car Service	806	806	806	760	466	648	46	340	158
	Taxis	0	0	0	0	0	0	0	0	0
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures (International)	**806**	**806**	**806**	**760**	**466**	**648**	**46**	**340**	**158**
	Shared Ride/Shuttles	75	75	75	80	80	120	(5)	(5)	(45)
	Buses	294	344	344	110	110	165	184	234	179
	At-Grade HOV	**369**	**419**	**419**	**190**	**190**	**285**	**179**	**229**	**134**
	Cars/Limos/Car Service	634	694	694	1100	1300	1625	(466)	(606)	(931)
	Taxis	365	365	365	175	200	250	190	165	115
	Shared Ride/Shuttles	143	143	143	0	0	0	143	143	143
	Buses	0	0	0	0	0	0	0	0	0
	At-Grade Arrivals	**1142**	**1202**	**1202**	**1275**	**1500**	**1875**	**(133)**	**(298)**	**(673)**
	Cars/Limos/Car Service	1149	1149	1149	1126	1163	1233	23	(14)	(84)
C	Taxis	0	0	0	0	0	0	0	0	0
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures (Domestic)	**1149**	**1149**	**1149**	**1126**	**1163**	**1233**	**23**	**(14)**	**(84)**
	Cars/Limos/Car Service	758	758	758	443	471	693	315	287	65
	Taxis	0	0	0	0	0	0	0	0	0
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures (International)	**758**	**758**	**758**	**443**	**471**	**693**	**315**	**287**	**65**

I.1 Airfield Capacity

The analysis of airfield capacity was conducted at a level of detail that identifies the approximate timing for policy level decisions about providing additional capacity or managing demand. This analysis relies on the baseline (unconstrained) forecasts for aircraft operations at each of the airports. The analysis does not address how users (airlines or private pilots) may react to a capacity limitation; how an airport manager may provide additional pavement to increase capacity or manage higher delays; or how an airport manager or the FAA may impose controls on airport access to manage demand. The analysis does describe how much additional capacity would be required to accommodate an unconstrained growth in aircraft traffic.

This study's analyses of airfield capacity focus solely on runways and taxiways and their context within the existing configuration of the regional and national airspace systems. Airfield capacity is defined by the number of aircraft operations that can occur within a given period of time at an "acceptable" level of service. Aircraft delay is an industry accepted metric for defining level of service. This study uses dynamic queuing models to compute aircraft delays caused by limited runway capacity, and maps aircraft queue lengths against the lengths of available taxiways that could accommodate queued aircraft. Queuing models an appropriate tool for this study since the approach does not need to address tactical operational issues associated with one of the more complex airspace settings in the nation.

The use of queue models requires a detailed understanding of the operating conditions and capacity of the airfield. While simulations models like TAAM and SIMMOD are able to calculate the capacity of the airfield internally, queue models rely on the modeler to accurately assess capacity externally to the model from various domain data sources in order to generate appropriate results.

Both the Port Authority of New York and New Jersey (PANYNJ) and the Federal Aviation Administration (FAA) have simulation model databases for existing and future demand cases. In addition, both agencies cooperate in maintaining a detailed database of aircraft operations at the three PANYNJ commercial service airports. This CATER database merges airline data, OAG data and FAA data into a single source that describes the timing of all flights (at the runway and at the gate), weather and runway use at each airport. In addition, the FAA keeps data on aircraft operational volumes and transit times, airport utilization and demand in the Airspace System Performance Metrics (ASPM) database. All of these data sources were used to calibrate the delay statistics from the queue models.

The following section describes the methodology and major assumptions. Airport specific assumptions and findings are presented in Sections II.1, III.1

and IV.1 respectively. More detailed information about each airport's data is presented in Appendix A.

I.1.1 Methodology and Assumptions

Spreadsheet based queue models are the analytical basis for the assessment of aircraft flight demand versus available airfield capacity. The queue models use three types of inputs: scheduled and unscheduled flight demand; the average annual arrival and departure runway capacity of the existing airfield; and the average annual capacity of the taxiway system to absorb departure delay. The model provides outputs on the number of aircraft queued for the arrival and departure runways, percent of aircraft waiting specific intervals of time and total runway queue delays. Delay is the difference between the scheduled and actual time it takes an aircraft to perform an arrival or departure. Delay is a measure of system operational performance that indicates the efficiency with which throughput is achieved. Delay statistics generated by the queue model can be shown by time of day for arrivals and departures.

The first type of model input is the aircraft flight demand. It consists of scheduled and non-scheduled arriving and departing aircraft for a twenty-four hour period. A flight schedule representing activity for a Year 2004 design day was developed based the Official Airline Guide (OAG) and CATER information for August 26, 2004. August 26 activity is representative of a typical weekday or a mode value during the peak month. This schedule was then converted to a daily profile of aircraft flight arrivals and departures by five minute periods. A flight schedule for the year 2015 baseline demand forecast was created based upon an analysis of future conditions created during the preparation of the forecasts. This schedule was also converted into a daily demand profile of flight arrivals and departures in a manner similar to that prepared for 2004. A 2025 profile was then computed by applying a constant growth factor (computed from the forecast) to the 2015 profile.

Runway capacity is the second type of input for the queue model. Analysis of the CATER databases for Years 2000 and 2004, as well as a review of simulation databases from previous delay studies were conducted to determine the levels of runway capacity utilization actually achieved on the existing airfields. Busy traffic periods were examined during various operating configurations for the three modes of operation used in the queue model; Arrival Runway Capacity Preference (where FAA Air Traffic Control manages air traffic flow to maximize arrival capacity), Departure Runway Capacity Preference (maximize departure capacity), and Balance Operation (provide equal arrival and departure capacity). Using the weather analysis from previous studies and the CATER databases, an average annual weighted average hourly capacity was developed for the existing airfield for input into the model. In addition, while CATER identifies the primary arrival and departure runways in use, CATER data also identifies the actual runway used by an individual flight. Correlation of these reported runways with the data that identifies primary runways identified secondary runways that were used to provide additional peak-period capacity for "arrival preference" and "departure preference" operations. The simultaneous combination of arrival and departure runways in use defines a "runway configuration". Runway configurations that had more than one percent of annual use were included in the analysis.

The analysis of CATER data either confirmed or updated the runway capacity values reported by the FAA ASPM database. This database also reports the annual use of each configuration and the percent of time various capacity utilization levels were actually achieved. Capacity was set based on values that reflect 95th percentile utilization rates. Use of actual capacity utilization rates assures that runway capacity values reflect airspace limitations. Capacity rates were then adjusted small amounts so that modeled delays matched those reported in the ASPM database.

The third type of data examined were taxi-out times as recorded in the CATER databases for a sampling of days that provide a representative cross-section of runway operating configurations. The correlation of gate departure times and runway departure times determined the number of aircraft moving simultaneously from the gates to the runways by time of day. The maximum values observed were compared with the length of taxiway available between the furthest gates and the departure runways. The analysis confirmed a maximum number of aircraft that could queue for the runway. When the queuing models show values that exceed these values, the delay will be reported as gate delay and a taxiway capacity issues will be noted.

As shown in **Exhibit I.1-1**, the queue model used in the demand capacity analysis consists of five linked spreadsheets; Flight Demand, Capacity, Arrival Runway Model, Departure Runway Model, and the Demand Analyzer. The flight demand profiles and airfield capacities are converted to five minute buckets. The Demand Analyzer evaluates the scheduled demand for each five minute period and looks ahead twenty minutes to determine the appropriate capacity mode. The demand analyzer then pushes the demand profiles and appropriate settings for the capacity mode by five minute buckets to the Runway Queue Models. The Runway Queue Models calculate the number of operations in the queue and the amount of time each operation is delayed. Operations that are delayed in the queue model are sent back to the demand analyzer and added to the scheduled demand. The scheduled demand and the queued demand for each five minute period are then analyzed as before to determine whether the appropriate mode of operation needs adjusting for a second iteration of the models.

The addition of the queued operations to the scheduled operations allows the model to switch capacity modes to react to actual runway demand. For example, the schedule operations for a particular period of time may be heavily loaded with departure operations followed by a period of time evenly balanced between arrivals and departures. During the first iteration the model will assign the departure mode up to the point where the schedule is evenly balanced. If the departure capacity is not sufficient to handle all the departures prior to the point at which the capacity switches to balanced mode, the departure runway model will generate a queue. In the second iteration, the model looks at the scheduled demand plus the queued demand and will maintain the departure mode for a longer period of time to clear out the queue that built up during the first iteration.

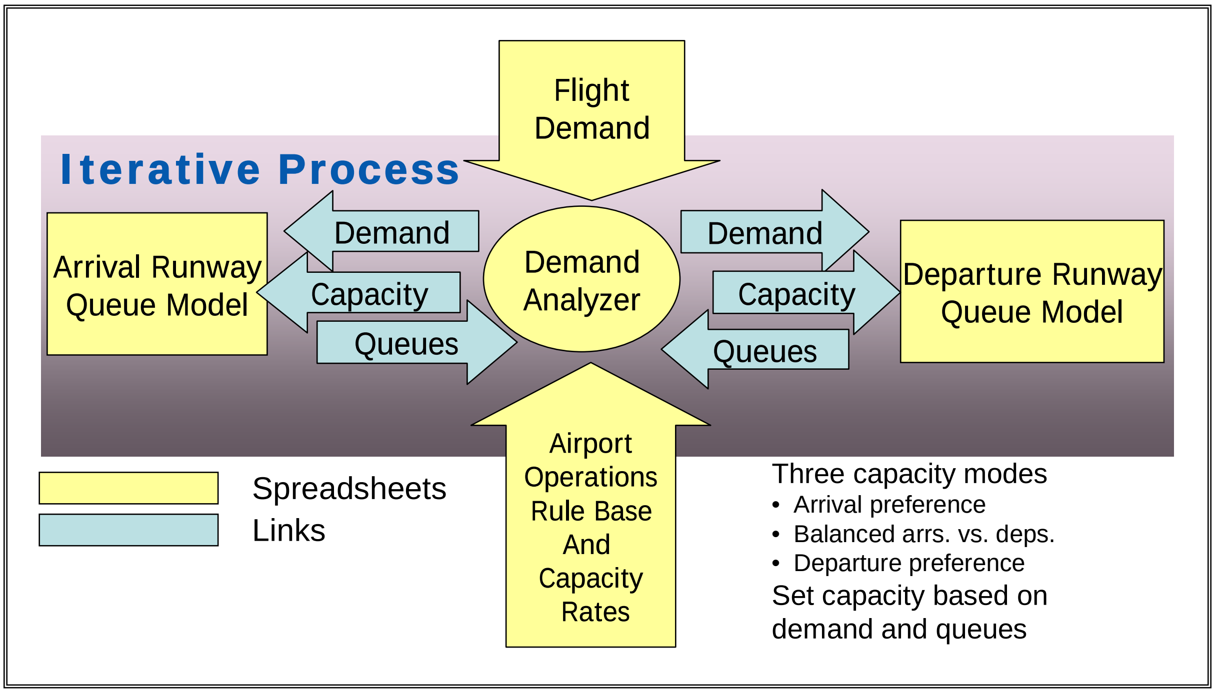
The model generates the following outputs after the second iteration:

- Average delay per aircraft by hour for arrivals and departures
- Average daily delay per aircraft for arrivals and departures
- Count of delayed aircraft
- Histogram with service capacity, number of aircraft in queue, inbound flow (demand), and outbound flow (throughput)

Summary of the outputs for each airport are provided in subsequent sections. Detailed outputs appear in Appendix A.

Exhibit I.1-1
Runway Queue and Delay Model

Source: Landrum & Brown



The model was calibrated by comparing average daily delay levels to those reported as the average annual delays by the FAA ASPM database. Delays that occur during outbound taxi and in the departure gate were attributed to the departure runway system. However, departure gate delays were excluded when they occurred during times when runways were not being used near capacity (e.

g. night). Similarly delays that occurred in the arrival airspace and in the gate at the origin airport were assigned to the arrival runway system. Gate delays for arrivals were excluded when they occurred during times when runways were not being used near capacity.

I.1.2 Determination of Future Runway Capacity Needs

Unlike the analysis of terminals and roadways no universally accepted standards for levels of service exist for the flow of air traffic through runways, taxiways and airspace. Thus, needs for runway capacity were defined by successive runs of the queue models against future demand levels to determine the level of capacity required to generate delays equivalent to 2004 levels.

This assessment of delay assumes that existing levels of delays are tolerated but makes no judgment about the acceptability of these delays. It merely indicates that the desire to use the airport during high delay periods exceeds the cost of operating delays.

I.2 Gate Capacity

Aircraft gates presented in the tables of Sections II, III and IV include all contact gates (i.e. those with loading bridges or direct walk-out from the terminal), and bus accessed gates if used on a regular basis for passenger operations. Gates with access to international arrivals facilities via sterile corridors (FIS gates) are shown as a sub-set of total gates.

The terminal capacity analysis presented in the tables and exhibits in the following sections was developed by Hirsh Associates.

I.2.1 Gate Demands

Future gate mixes were developed based on the 2015 Design Day schedules (see Task D Report). Schedules were processed through models which assigned the following parameters:

Buffer times between a scheduled departure and the next arrival:

JFK and EWR - 20 minutes

LGA - 15 minutes, except for the CTB. CTB uses 30 minutes due to taxilane restrictions.

For aircraft towed to or from a remote parking position:

All arrivals - 30 minutes on gate prior to tow-off

Narrowbody departures - 30 minutes on gate prior to departure

Widebody domestic departures - 60 minutes on gate prior to departure

International departures - 90 minutes on gate prior to departure

Within a terminal, all gates are considered common use for capacity analysis unless specifically noted otherwise.

In order to have a consistent basis for gate demand, flights with ground times greater than three hours were assumed to be towed off gate to a remote parking position rather than occupying a contact gate for that time period. This is consistent with the gate management policy of JFK T-4 and other airports with common use gates, and is referred to in this report as "active gate management". By comparing the number of aircraft on the ground with and without active gate management, the number and mix of remote parking positions was determined for these international terminals, as well as the number of RON aircraft for terminals with more typical domestic scheduling.

Additional remote positions for remain overnight (RON) or layover aircraft parking are not included in the terminal capacity analysis tables. For over-all apron planning purposes, the additional RON positions (if any) for each terminal in 2015 are provided in a separate table in Sections II, III and IV.

The number of FIS gates was determined in a similar manner by assuming aircraft are towed-off after 30 minutes. When the 20 minute buffer to the next arrival is included, the actual FIS gate maximum occupancy time for a given arrival is 50 minutes which is considered more than adequate for arrivals processing. The number of FIS gates is the minimum number to support the design day schedule with active gate management. Because international flights may depart from any gate, the number of FIS gates can be less than the total number of gates, even if all of the activity in a terminal is international

An example of gate mixes is shown in Exhibits I.2-1 through I.2-4 for JFK Terminal 8. Exhibit I.2-1 illustrates the total number of aircraft on the ground including RONs which peaks at 06:10 with 46 aircraft when some "red-eye" and regional feeder flights arrive. In Exhibit I.2-2, only active gates are shown with RON flights removed 30 minutes after arrival and towed to a gate 90 minutes prior to departure, resulting in a peak demand of 35 gates at 16:40. In Exhibit I.2-3, flights with ground times in excess of three hours were towed off and on to gates using similar times as RON flights. This reduces the number of active gates to 28, both in the morning and early evening. Finally, in Exhibit I.2-4, only international arrivals are included.

For the other planning years in the forecast (2010, 2020 and 2025) the total number of gates was estimated by interpolating and extrapolating the 2004 and 2015 gate totals as compared to the forecasts of annual operations for each terminal. FIS gates were estimated in a similar manner, but based on international operations.

Once the number of gates was estimated, gate mixes were developed based on the trends in fleet mix changes shown in the Forecast Report. Three trends in particular are reflected in the changing gate mixes:

- B737-900 and A321 aircraft have the range and size of many B757s, and in the long term are expected to replace the B757 at many terminals. Thus the number of B757 gates tends to decrease in later years of the forecast. However, these aircraft are as long as a B757 and may not fit on all Group III gates.

- These and other longer range narrow body aircraft are forecast to provide international service to new markets, thus increasing the number of NB FIS gates at some terminals.

- Newer generations of widebody aircraft have wider wingspans (B787, A350) resulting in a demand for Group V gates even though aircraft seating capacities are not increasing to typical "jumbo" (B747/777, A340) sizes.

It is recognized that for operational reasons and to handle off-schedule operations, additional gates would likely be planned for certain terminals. These policies vary by airline and airport. In order to provide a consistent capacity analysis for all the airports, such additional gates have not been included in the demand calculations.

I.2.2 Gate Metrics

Airport comparisons are frequently made on the basis of passengers per gate, or terminal area per gate, but these lack a consistent definition of the term "gate". To standardize the definition of "gate" when evaluating aircraft utilization and requirements, the consultant has developed a statistic referred to as a NarrowBody Equivalent Gate (NBEG). This statistic is used to normalize the apron frontage demand and capacity to that of a typical narrowbody aircraft gate. The amount of space each aircraft requires is based on the *maximum* wingspan of aircraft in its respective aircraft group. FAA Airplane Design Groups have been used to classify the aircraft as follows:

NarrowBody Equivalent Gate (NBEG) Index

FAA Airplane Design Group		Maximum Wingspan	Typical Aircraft	NBEG Index
I.	Small Regional	49'	Metro	0.4
II.	Medium Regional	79'	SF340/CRJ	0.7
III.	Narrowbody/Lrg. Regional	113'	A320/B737/MD-80/ATR	1.0
IIIa.	B757	125'	B757	1.1
IV.	Widebody	171'	DC-10/MD-11/B767	1.5
V.	Jumbo		214'	
B747/A330,340/B777		1.9		
VI.	A380	262'	A380	2.3

The basis for Group III has been reduced to 113' (from 118' maximum wingspan) to reflect the majority of Group III aircraft in production: the B737-600/700/800 and the A319/320/321. Group IIIa has also been added to more accurately reflect the B757 which has a wider wingspan than Group III but is substantially less than a typical Group IV aircraft.

In developing terminal facilities requirements, the apron frontage of the terminal, as expressed in NBEG is a good determinant for some facilities and allows different gate configurations to be compared.

It should be noted that some aircraft are longer than average for their design group and may not be accommodated on every gate. These include the A321 and B737-900 in Group III; the B767-400 in Group IV; and the A340-600 and B777-300 in Group V. More detailed apron studies may be required if the fleet mix contains significant numbers of these aircraft in order to fully utilize the frontage capacity.

The concept of Equivalent Aircraft (EQA) is similar to that of NBEG, i.e. a way to look at the capacity of a gate. EQA, however, normalizes each gate based on the seating capacity of the aircraft which can be accommodated. The EQA concept was originally developed in the early- to mid-1970's as a technique for sizing terminal facilities[1]. At that time, the majority of jet aircraft had 80 to 110 seats, with some larger narrowbodies of up to 150 seats. The only widebody aircraft in service were the DC-10-10, L1011-100 and B747-100. Consequently, the EQA measure centered on the 80-110 seat range with an EQA of 1.0.

In considering the modern fleet mix of regional and jet aircraft, and in order to have some relationship with the physical parameters associated with the NBEG, the basis for EQA has been revised. The modern Equivalent Aircraft is also a Group III narrowbody jet, however the larger aircraft in this class typically have 140-150 seats. This establishes a basis of 1.0 EQA = 145 seats. As with the concept of NBEG, smaller aircraft may use a gate, but the EQA capacity should be based on the largest aircraft/seating configuration typically in use:

Equivalent Aircraft (EQA) Index

FAA Airplane Design Group		Typical Seats	Typical Aircraft	EQA Index
I.	Small Regional	25	Metro	0.2
II.	Medium Regional	50	SF340/CRJ	0.4
III.	Large Regional	70	ATR/EMB-170	0.5
III.	Narrowbody	145	A320/B737/MD-80	1.0
IIIa.	B757	185	B757	1.3
IV.	Widebody	280	DC-10/MD-11/B767	1.9
V.	Jumbo		400	
B747/A330,340/B777		2.8		
VI.	A380	550	A380	3.8

While most terminal facility requirements are a function of design hour passenger volumes, some airline facilities are more closely related to the size of the aircraft. For example, while the total number of baggage carts or containers required for a flight are a function of design hour passengers (and their bags), the number of carts/containers staged at any one time are generally based on

1 The Apron & Terminal Building Planning Manual; for US DOT, FAA by The Ralph M.Parsons Company; July 1975

the size of the aircraft. Thus, the EQA of the terminal can represent a better indicator of demand for these facilities

Exhibit I.2-1
JFK – Nominal Gate Demand - Terminal 8

2015 Design Day
No Tow offs
RON Parking Positions Included
Minimum Buffer Time: 20 Minutes

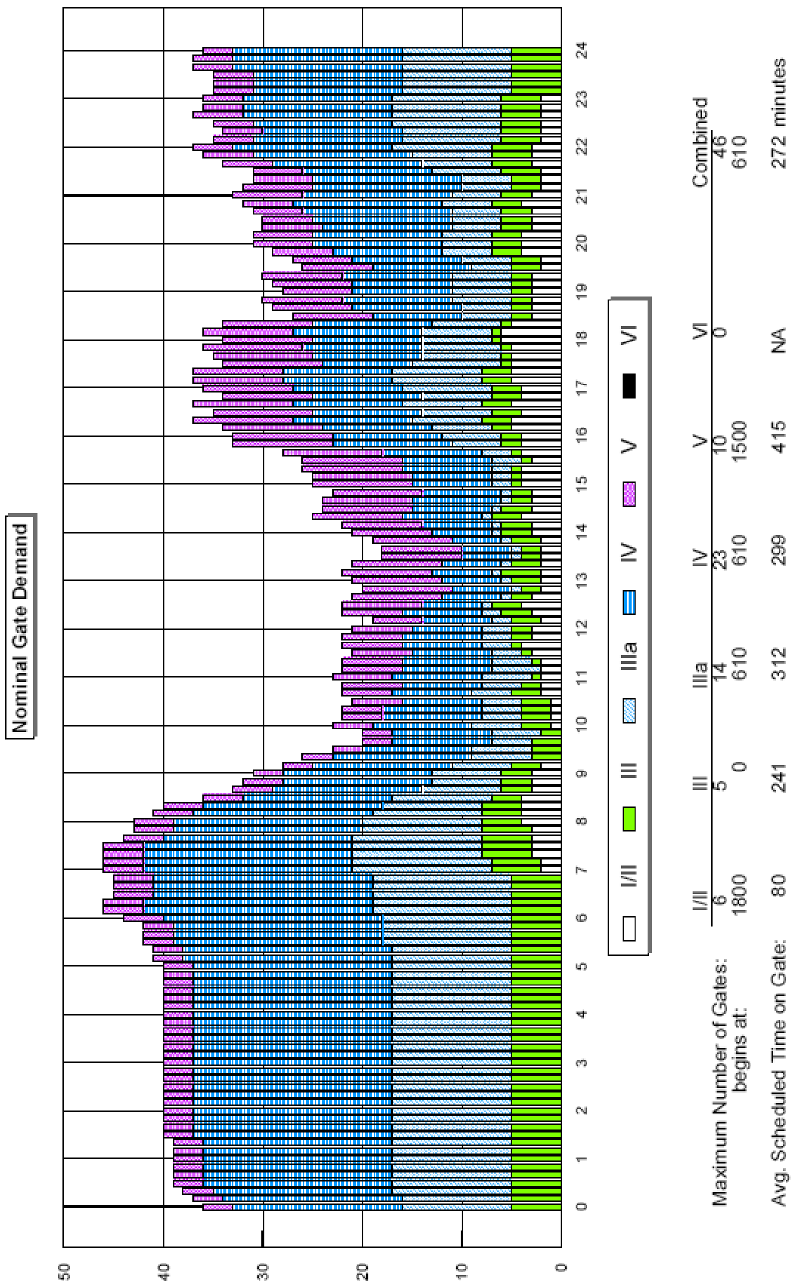


Exhibit I.2-2
JFK – Nominal Gate Demand - Terminal 8

2015 Design Day
Active Gates Shown
Minimum Buffer Time: 20 Minutes
RON Flights on Gate: 90 minutes before departure / 30 minutes after arrival

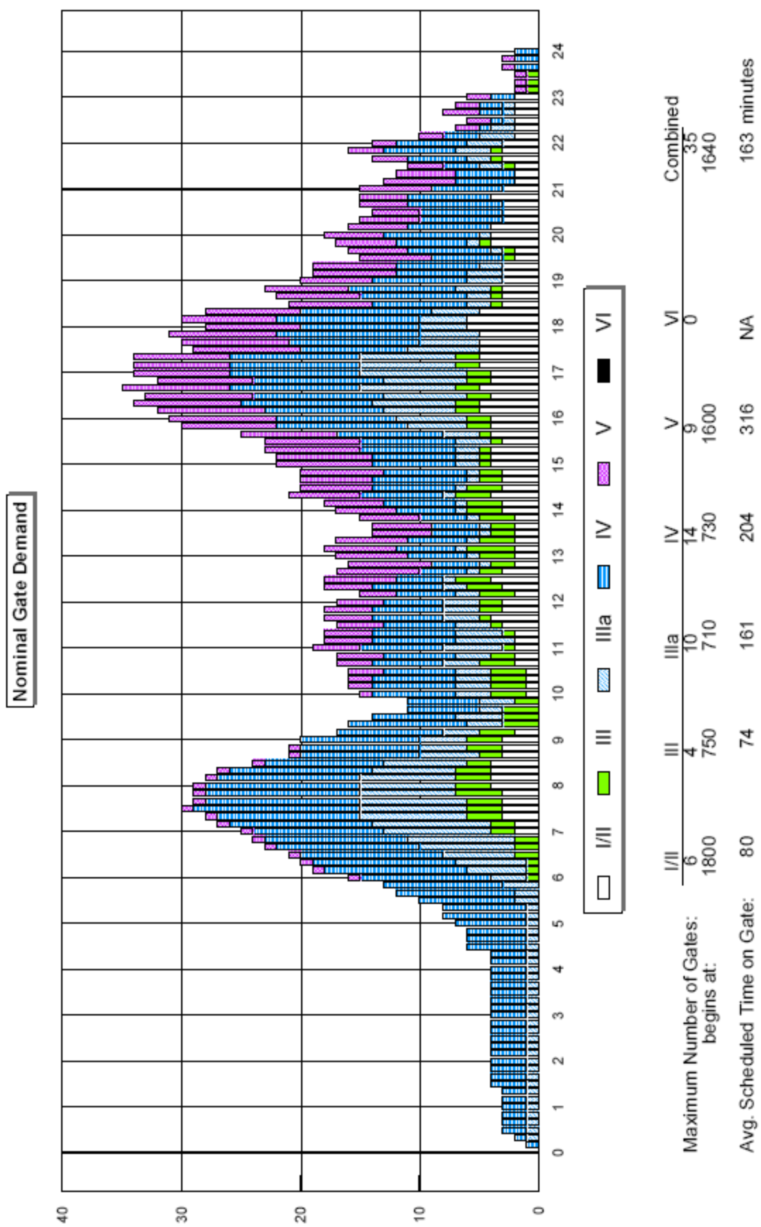


Exhibit I.2-3
JFK – Nominal Gate Demand - Terminal 8

2015 Design Day
Active Gates Shown
Tow-Off > 3 hours
Minimum Buffer Time: 20 Minutes
RON Flights on Gate: 90 minutes before departure / 30 minutes after arrival

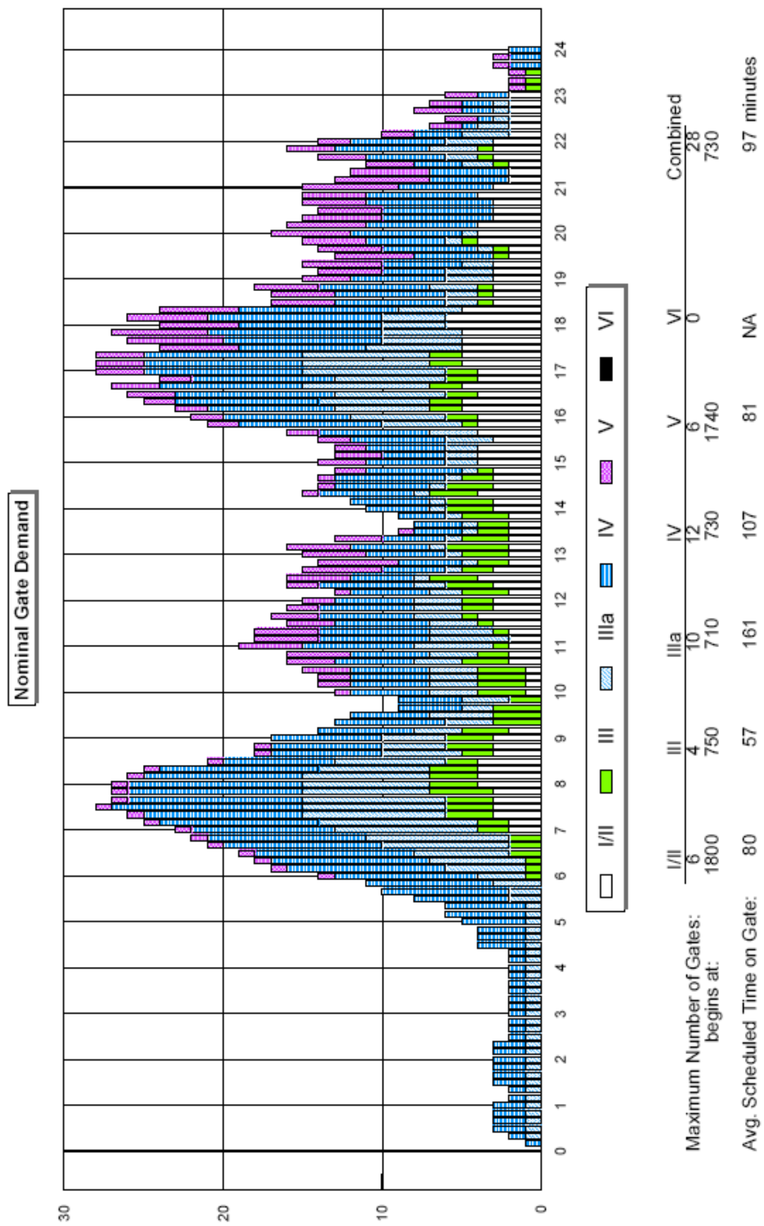
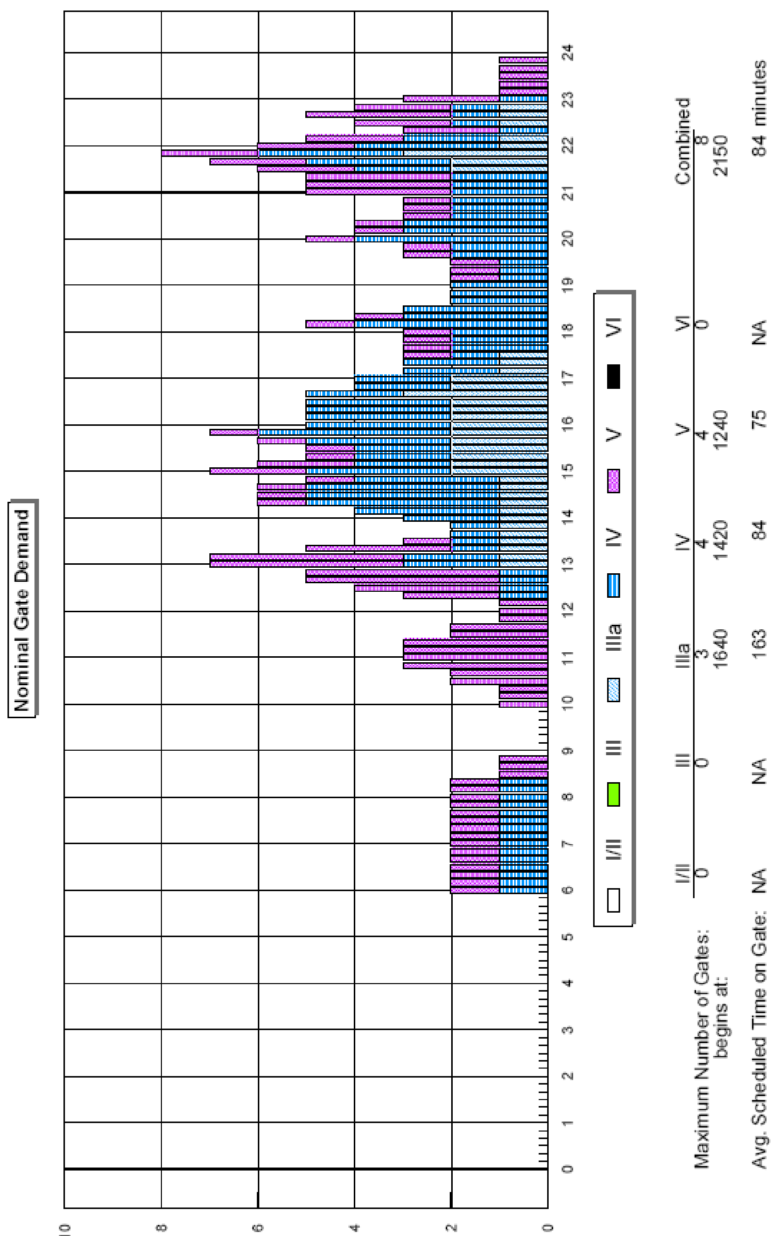


Exhibit I.2-4
JFK – Nominal Gate Demand - Terminal 8 (FIS Gates)

2015 Design Day
Active Gates Shown
Tow-Off > 3 hours
Minimum Buffer Time: 20 Minutes
RON Flights on Gate: 90 minutes before departure / 30 minutes after arrival



I.3 Terminal Capacity

I.3.1 Design Level Activity

Airport terminal facilities are sized to accommodate the peak hour passenger volumes of a design day. Annual enplanements are an indicator of over-all airport size, however peak hour volumes more accurately determine the demand for terminal facilities based upon the specific user patterns of a given airport or terminal. Peak hour passengers are typically defined as Peak Hour-Average Day-Peak Month (PHADPM) passengers, and are also often referred to as Design Hour passengers. The Design Hour measures the number of enplaned and deplaned passengers departing, or arriving, on aircraft in an elapsed hour of a typically busy (design) day. The Design Hour typically does not correspond exactly to a "clock hour" such as 7:00-7:59 but usually overlaps two "clock hours", e.g. 7:20-8:19 reflecting airline scheduling patterns.

The Design Hour is not the absolute peak level of activity, nor is it equal to the number of persons occupying the terminal at a given time. It is, however, a level of activity which the industry has traditionally used to size many terminal facilities. The number of persons in the terminal during peak periods, including visitors and employees, is also typically related to Design Hour passengers.

Each airport or terminal also has its own distinct peaking characteristics due to differences in airline schedules; business or leisure travel; long or short haul flights; the mix of mainline jets and regional aircraft; originating/terminating passenger activity or transfer passenger activity; and international passenger or domestic passenger use. These peaking characteristics determine the size and type of terminal facilities. Thus, two airports or terminals with similar numbers of annual passengers may have different terminal requirements, even if the Design Hour passenger volumes are similar.

Since the deregulation of the airlines, most major airlines have developed "hub" and "spoke" route systems such as American's hubs in Chicago and Dallas/Ft. Worth; Delta's hubs in Atlanta and Cincinnati; United's in Chicago and Denver; etc. At these hubs there are a number of banks of flights when most passengers change planes to reach their final destination. These banks of connecting flights form a series of peaks during the day - typically seven to 10. Recent changes in airline operations in many cases have flattened the peaks, however the basic idea of connecting banks still remains.

In contrast, the other cities served by the airlines are referred to as "spokes". Individual airline schedules at the spoke cities are generally tied to the connecting banks at their hubs. Most airlines have similar scheduling patterns and these tend to reinforce each other at the spoke airports resulting in, for example, a large number of departures between 7 and 7:30 a.m. More recently, airlines have been re-establishing point to point service in some larger markets such as New York, often with regional jets, thus bypassing hubs. This can help spread activity during the day and increase gate utilization.

International service at most PANYNJ airports is focused on North Atlantic destinations. Due to European curfews and other considerations (such as connections), most flights arrive in mid-afternoon and depart in early to late evening. This is referred to as a typical North Atlantic scheduling pattern.

Scheduling Patterns

Each of the New York area airports has a different pattern of activity, and within each airport, scheduling patterns can vary by terminal. An analysis of these characteristics is presented in the report on design day schedules (Task D).

The following summary represents activity for the 2004 Base Design Day. Any assumed changes for the 2015 Design Day are also noted.

JFK:

Terminal 1 - International activity. Primarily a North Atlantic pattern with some mid-day flights to Asia.

Terminals 2 & 3 - A low level of domestic activity for most of the day with a large late afternoon/early evening peak timed to connect with its North Atlantic international flights.

Terminal 4 - Primarily an international terminal with a North Atlantic pattern, some later North Atlantic flights and early southern destinations. Late (2300-2400) departures are forecast to increase significantly by 2015 which shifts the departure peak hour from 17:50 to 23:00. Domestic activity was limited to a few Northwest flights and hourly RJ departures (since discontinued and not forecast to return).

Terminal 5/6 - Base 2004 activity for JetBlue is used for Terminal 6. This reflects a typical hub operation although with a strong O&D emphasis in early departures and late arrivals. Terminal 6 has no activity assigned in the forecasts for 2010 and beyond. For 2015, the JetBlue pattern is similar to 2004 and is assigned to Terminal 5. The limited amount of international activity has been combined with domestic departures. Most JetBlue international arrivals are forecast to be from pre-cleared cities. The limited number of flights requiring FIS facilities are assumed to arrival at T-4.

Terminal 7 - Domestic activity is almost all long-haul transcontinental service. This has an early morning peak for departures; almost hourly departures throughout the day; arrivals beginning late in the day into the late night; and "red-eye" arrivals in the early morning hours. International activity is primarily a North Atlantic pattern with some mid-day Asian flights.

Terminal 8 - Domestic activity is heavily transcontinental and to AA hubs with international connections (San Juan and Miami), with some RJ feeder flights. International is a combination of Caribbean (morning departures/late arrivals) and North Atlantic patterns.

LGA:

Central Terminal Building - Although primarily a spoke airline pattern, runway capacity limitations spread out activity.

Delta/Northwest Terminal - A combination of spoke airline patterns with higher frequencies to each airline's hubs and off-peak service to leisure destinations.

Delta Shuttle Terminal - Hourly service to Boston and Washington results in a very flat pattern of activity.

US Airways Terminal - A combination of spoke activity, hourly shuttles and higher frequency regional aircraft. Except for the Marine Terminal, the only terminal with significant early morning arrivals.

EWR:

Terminal A - Primarily a domestic spoke pattern with some international departures (Canada). Higher frequencies to some cities maintains a reasonable amount of off-peak activity.

Terminal B - A mix of domestic spoke activity with a typical North Atlantic international pattern. In 2015, international departures are assumed to spread slightly reducing the peak hour as a percentage of daily activity.

Terminal C - Continental's EWR hub has a strong domestic O&D component. Scheduling reflects a combination of early departures for originating passengers and a series of connecting banks throughout the day. International activity combines early morning departures to southern destinations with typical later North Atlantic patterns. Hub scheduling is focused more on international gateway activity than typical domestic to domestic connections. International activity in 2015 is assumed to increase both over-all, and spread through the afternoon with multiple arrival banks.

Design Level Activity

Estimates of Design Hour Passengers have been developed based on scheduled seats and Peak Day passengers. This has been done using historic passengers and schedules for the 2004 Base Year, and forecasts and Design Day Schedules developed for 2015. Design Hour passengers for other years have been interpolated from 2015. For each terminal, the 2004 and 2015 Design Day schedules were analyzed to determine:

- Daily and rolling peak hours for departing, arriving and total seats;
- The percentage of daily seats represented by the peak hour; and
- The times the peak hours begin.

Exhibit I.3-1 illustrates this for the LGA CTB in 2015. Sections II, III and IV contain output for all of the terminals by airport. Where appropriate, domestic and international activity were analyzed separately. For the purposes of terminal facilities planning, flights arriving from Canada, Bermuda and some Caribbean islands are considered domestic since these are assumed to be pre-cleared.

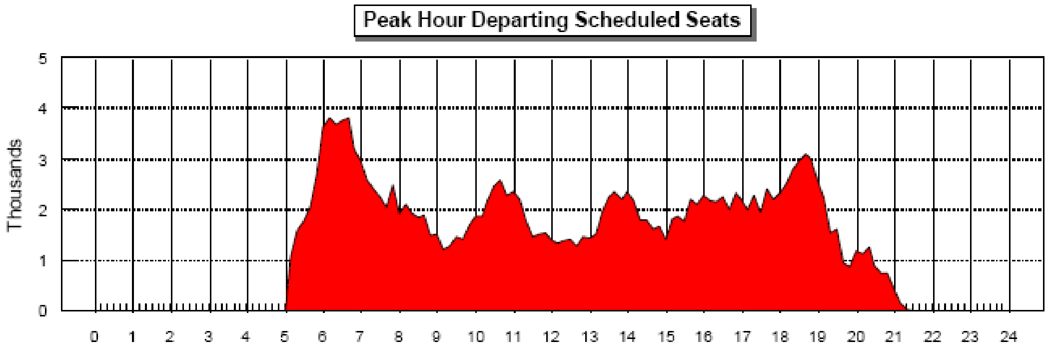
In some terminals, there are passengers departing on domestic flights to connect with international flights at another city (for example LGA to MIA). Although some airlines may have separate check-in counters for these passengers, these are treated as domestic activity since it was not possible to estimate the percentage of international passengers on specific domestic flights.

Scheduled seats were combined with assumptions of peak hour load factors and percentages of connecting passengers where appropriate. For most terminals, a design hour load factor of 85-90% for domestic and 95% for international was assumed.

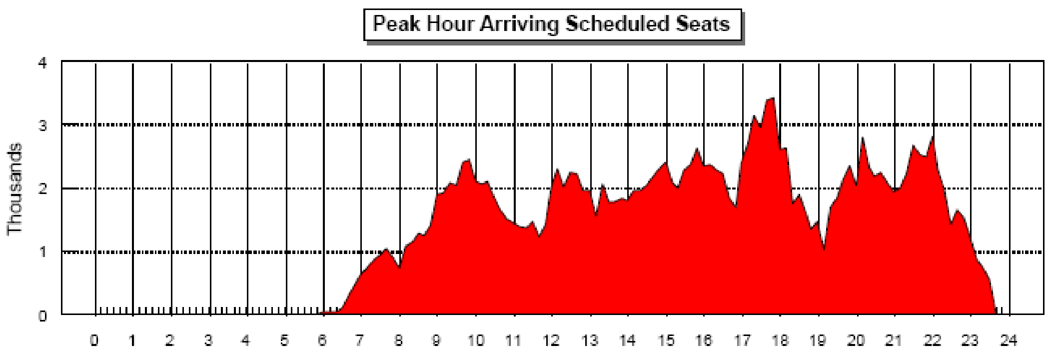
For the intermediate forecast year (2010), design hour passengers were interpolated between the 2004 and 2015 design hour passengers. For the longer term forecasts out to 2025, design hour passengers were extrapolated from 2015 based on increases in average day-peak month enplanements. The 2015 patterns of activity were assumed to remain stable through 2025.

Assumptions for O&D and connecting passengers during the peak hours reflects both annual connecting passenger data and the patterns of arriving and departing seats. For example, Continental at EWR has a significant amount of connecting traffic on an annual or daily average. However, during the morning departure peak most of the enplaning passengers are local which determines the demand for check-in facilities. In contrast, Delta's JFK schedule is heavily coordinated for connections at peak times.

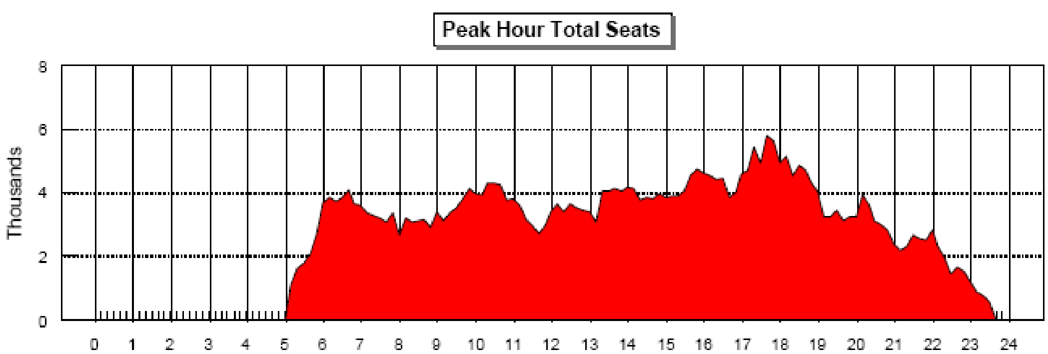
Exhibit I.3-1
LGA - Central Terminal Building – 2015 Design Day



Peak Hour Seats: 3,810 begins at 640 Daily Seats: 31,941
Peak Hour = 11.9% of daily seats



Peak Hour Seats: 3,443 begins at 1750 Daily Seats: 31,941
Peak Hour = 10.8% of daily seats



Peak Hour Seats: 5,792 begins at 1740 Daily Seats: 63,882
Peak Hour = 9.1% of daily seats

I.3.2 Projected Terminal Facilities Demands

Recommended facilities for a terminal are a function of the specific unique characteristics of that terminal. These include the design levels of passenger and aircraft activity; the number and type of airlines utilizing the terminal; the operating requirements of the airlines; and local factors such as the proportions of connecting passengers, leisure vs. business travelers, locally originating passengers, etc.

Unlike airfield facilities, the capacity of each element of a terminal facility can vary depending on the level of crowding and/or processing time which is considered acceptable. A passenger travelling on business may be less tolerant of congestion or delay than a passenger travelling for pleasure. In many cases the degree of acceptability itself may also vary depending on the configuration of the terminal space and the level of amenity provided. Thus, the 'capacity' of a terminal can vary significantly.

The approach taken in developing the capacity analyses has been to review the available plans and areas of the terminals, visit each terminal to confirm existing utilizations, and observe the activity in the terminals. These observations - coupled with calculations of area per passenger, per gate, or other determinant of demand - were compared to generally accepted industry planning factors. Existing and proposed Port Authority (PANYNJ) standards and guidelines were discussed with PANYNJ representatives and have been used where appropriate. Passenger characteristics were also obtained from the 2005 passenger surveys conducted as part of this Study.

From these comparisons, a planning factor for each terminal component was determined and used to project facility requirements for each forecast period. These were then compared to existing facilities to estimate future excess capacities or deficiencies.

For each terminal a table was prepared containing the following:

1) <u>Existing and Approved Buildings Through 2008</u>: Areas were taken from terminal CAD drawings (where available) provided by the Port Authority or individual terminal operators/airlines. Gross areas are used. These were field checked during May through July 2005 to confirm current utilization and add details (such as self-service check-in kiosks) which may not appear on the plans.

   In some cases, such as Terminals 5 and 8 at JFK, and Terminal B at EWR, planned projects which are committed to be functioning by 2008 were considered as existing conditions. These are noted on the individual tables.

2) Recommended Facilities: These areas represent the facilities which would be needed to support current and forecast levels of passenger activity. These were developed for the base year 2004, and the four planning forecast years 2010, 2015, 2020 and 2025. The recommended areas are typically not concept-specific. However, the configurations of the existing terminals have been taken into account where appropriate.

6) Projected Surplus or Deficiency: These entries point out those functions of the existing terminals which are either undersized or oversized compared to what would be recommended to accommodate future activity. Excesses suggest potential areas which may be convertible to other functions or to provide additional capacity for growth beyond forecast levels.

In the following capacity analyses, functions are listed for passenger processing (check-in, security screening, holdrooms, baggage claim and international arrivals) in the order a passenger would use them; airline operations and support; concessions; and other public spaces.

Table I.3-1 illustrates the analysis for JFK Terminal 8. Sections II, III and IV contain the analyses for all of the terminals by airport as well as a summary of the major surpluses and deficiencies for each terminal.

In order to easily compare the key assumptions used for each terminal, a table in the beginning of each summarize these assumptions for each terminal by airport. These are also included as Tables I.3-2 through I.3-4 to allow direct comparison of assumptions between airports.

In a number of terminals, achieving the full capacity of existing facilities will require: additional investment (not identified explicitly herein); changes in airline leases; and/or changes in operating procedures from exclusive to preferential, or common use. (For example, in order to fully utilize the check-in counter capacity in EWR Terminal A, modifications to the outbound baggage systems may be required to allow more flexibility in use. In other terminals, such as the LGA CTB, changes from exclusive to preferential or common use for gates and baggage claim may be necessary to balance utilization across the terminal.) These potential solutions would need to be studied in further detail to determine the optimum approach for addressing each terminal's capacity constraints.

Table I.3-1
JFK Terminal Capacity Analysis – Terminal 8

Table I.3-1

Terminal Capacity Analysis
John F. Kennedy International Airport
Terminal 8

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
Annual Enplanements											
Domestic		2,198,388	2,634,500	2,714,000	2,799,600	2,892,600					
International		1,955,427	2,485,900	2,776,700	3,139,800	3,574,300					
Combined		4,153,815	5,120,400	5,490,700	5,939,400	6,466,900					
Design Hour Factors:											
Domestic Load Factor		90%	90%	90%	90%	90%					
Domestic Connect %		10%	20%	20%	20%	20%					
International Load Factor		90%	95%	95%	95%	95%					
International Connect %		20%	20%	20%	20%	20%					
Design Hour Passengers											
Enplaned Domestic O&D		1,110	980	840	870	900					
Enplaned Domestic total		1,230	1,140	1,040	1,070	1,110					
Deplaned Domestic O&D		960	1,220	1,480	1,530	1,580					
Deplaned Domestic total		1,070	1,460	1,850	1,910	1,970					
Enplaned International O&D		1,070	1,220	1,360	1,540	1,750					
Enplaned International total		1,330	1,510	1,690	1,910	2,180					
Deplaned International O&D		870	1,110	1,350	1,530	1,740					
Deplaned International total		1,080	1,390	1,690	1,910	2,180					
Meeter/Greeters per O&D Passenger		0.8	0.8	0.8	0.8	0.8					

Table I.3-1
JFK Terminal Capacity Analysis – Terminal 8(con't)

Table I.3-1

Terminal Capacity Analysis
John F. Kennedy International Airport
Terminal 8

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	9 gates	3	5	6	6	6	6	4	3	3	3 gates
Narrowbody (Group III)	0 gates			3	3	5	0	0	(3)	(3)	(5)gates
B757 (Group IIIa)	1 gates		6	10	10	8	1	(5)	(9)	(9)	(7)gates
Widebody (Group IV)	20 gates	16	12	7	9	11	4	8	13	11	9 gates
B747/A340 (Group V)	2 gates	2	4	6	6	7	0	(2)	(4)	(4)	(5)gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	32 gates	21	27	32	34	37	11	5	0	(2)	(5)gates
Narrowbody Equivalent Gates (NBEG)	41.2 NBEG	29.9	35.7	40.1	43.1	47.8	11.3	5.5	1.1	-1.9	-6.6 NBEG
Equivalent Aircraft (EQA)	48.5 EQA	37.2	43.8	48.5	52.3	58.3	11.3	4.7	0.0	-3.8	-9.8 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates		2	3	3	2	0	(2)	(3)	(3)	(2)gates
Widebody (Group IV)	13 gates	6	3	1	2	3	7	10	12	11	10 gates
B747/A340 (Group V)	1 gates	2	3	4	4	5	(1)	(2)	(3)	(3)	(4)gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	14 gates	8	8	8	9	10	6	6	6	5	4 gates
Narrowbody Equivalent Gates (NBEG)	21.4 NBEG	12.8	12.4	12.4	13.9	16.2	8.6	9.0	9.0	7.5	5.2 NBEG
Equivalent Aircraft (EQA)	27.5 EQA	17.0	16.7	17.0	18.9	22.3	10.5	10.8	10.5	8.6	5.2 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	42 pos	17	12	10	11	11	25	30	32	31	31 pos
Self-Service Kiosks	18 units	19	16	14	14	15	(1)	2	4	4	3 units
Equivalent Positions	60 pos	36	28	24	25	26	24	32	36	35	34 pos
Linear Positions	42 pos	26	20	17	18	19	16	22	25	24	23 pos
Counter length	231 LF	140	110	90	100	100	91	121	141	131	131 LF
Ticket Lobby - depth	77 LF	45	45	45	45	45	32	32	32	32	32 LF
Ticket Lobby - area	11,070 SF	7,000	5,500	4,500	5,000	5,000	4,070	5,570	6,570	6,070	6,070 SF
Ticket Counter - International											
Conventional Staffed Positions	59 pos	52	52	58	66	75	7	7	1	(7)	(16)pos
Self-Service Kiosks	0 units	3	7	8	9	10	(3)	(7)	(8)	(9)	(10)units
Equivalent Positions	59 pos	55	59	66	75	85	4	0	(7)	(16)	(26)pos
Linear Positions	59 pos	55	59	66	75	85	4	0	(7)	(16)	(26)pos
Counter length	331 LF	300	320	360	410	470	31	11	(29)	(79)	(139)LF
Ticket Lobby - depth or separation	77 LF	80	80	80	80	80	(3)	(3)	(3)	(3)	(3)LF
Ticket Lobby - area	15,550 SF	12,800	13,600	15,300	17,400	20,000	2,750	1,950	250	(1,850)	(4,450)SF
Ticket Counter - area	10,650 SF	5,600	5,600	5,900	6,700	7,600	5,050	5,050	4,750	3,950	3,050 SF
Subtotal	37,270 SF	25,400	24,700	25,700	29,100	32,600					SF

Table I.3-1
JFK Terminal Capacity Analysis – Terminal 8 (con't)

Terminal Capacity Analysis
John F. Kennedy International Airport
Terminal 8

Table I.3-1

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
HOLDROOMS & SECURE CIRCULATION											
Security Screening (SSCP) Lanes	10 lanes	8	8	8	9	9	2	2	2	1	1 lanes
Checkpoint/Search Area	15,740 SF	10,500	10,500	10,500	11,800	11,800	5,240	5,240	5,240	3,940	3,940 SF
Secure Circulation	118,420 SF	74,300	88,700	99,600	107,100	118,700	44,120	29,720	18,820	11,320	(280) SF
Concourse Width	32-38' LF	45	45	45	45	45	(7-13)	(7-13)	(7-13)	(7-13)	(7-13) LF
Sterile (Int'l Arrivals) Circulation	55,790 SF	15,000	14,500	14,500	16,300	19,000	40,790	41,290	41,290	39,490	36,790 SF
Holdrooms:											
Regional Aircraft (Groups II & III)	SF	2,400	4,000	4,800	4,800	4,800					SF
Narrowbody (Group III)	SF	0	0	5,600	5,600	9,300					SF
B757 (Group IIIa)	SF	0	14,400	24,000	24,000	19,200					SF
Widebody (Group IV)	SF	45,600	34,200	20,000	25,700	31,400					SF
B747/A340 (Group V)	SF	8,900	17,800	26,700	26,700	31,200					SF
A380 (Group VI)	SF	0	0	0	0	0					SF
Total Holdroom Area	82,605 SF	56,900	70,400	81,100	86,800	95,900	25,705	12,205	1,505	(4,195)	(13,295) SF
Subtotal	272,555 SF	156,700	184,100	205,700	222,000	245,400					SF
DOMESTIC BAGGAGE CLAIM											
Claim Frontage Required	- LF	420	470	570	590	610					LF
Claim Units	3 units	2	2	3	3	3	1	1	0	0	0 units
Claim Frontage Programmed	660 LF	440	440	660	660	660	220	220	0	0	0 LF
Baggage Claim Area	22,450 SF	15,400	15,400	23,100	23,100	23,100	7,050	7,050	(650)	(650)	(650) SF
FEDERAL INSPECTION SERVICES											
Primary Inspection:							0	0	0	0	0
Double Inspection Counters	18 dbl. counters	9	12	15	16	19	9	6	3	2	(1) dbl. counters
Counter & Queue Area	18,720 SF	11,400	15,200	19,100	20,300	24,100	7,320	3,520	(380)	(1,580)	(5,380) SF
Baggage Claim:											
Claim Frontage Required	- LF	670	810	980	1,110	1,270					LF
Claim Units	3 units	3	3	4	4	5	0	0	(1)	(1)	(2) units
Claim Frontage Programmed	840 LF	840	840	1,120	1,120	1,400	0	0	(280)	(280)	(560) LF
Baggage Claim Area	30,180 SF	29,400	29,400	39,200	39,200	49,000	780	780	(9,020)	(9,020)	(18,820) SF
Subtotal	48,900 SF	40,800	44,600	58,300	59,500	73,100					SF

Table I.3-1
JFK Terminal Capacity Analysis – Terminal 8 (con't)

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Recommended Facilities - Demand: Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Projected Surplus / (Deficiency): Forecast Year Activity 2010	2015	2020	2025
AIRLINE SPACE											
ATO Offices	7,760 SF	13,200	12,900	13,500	15,300	17,100	(5,440)	(5,140)	(5,740)	(7,540)	(9,340) SF
Airline Operations & Offices (excluding ATO)	156,140 SF	104,200	122,600	135,800	146,400	163,200	51,940	33,540	20,340	9,740	(7,060) SF
Baggage Handling											
Estimated make-up capacity	211 carts/LD3s	112	131	146	157	175	99	80	66	54	36 carts/LD3s
Baggage Make-up area	57,150 SF	30,100	35,500	39,300	42,400	47,200	27,050	21,650	17,850	14,750	9,950 SF
Checked Baggage Screening	53,950 SF	16,000	16,000	16,000	16,000	19,200	37,950	37,950	37,950	37,950	34,750 SF
Baggage Claim Off-load	34,200 SF	12,500	12,500	17,500	17,500	20,000	21,700	21,700	16,700	16,700	14,200 SF
Airline Clubs & 1st/Bus. Class Lounges	37,900 SF	37,900	37,900	37,900	37,900	37,900	0	0	0	0	0 SF
Baggage Service Offices	4,830 SF	3,100	3,900	4,800	5,200	5,600	1,730	930	30	(370)	(770) SF
Subtotal	351,930 SF	217,000	241,300	264,800	280,700	310,200					SF
CONCESSIONS											
Ground Services/Information Counter	300 SF	200	200	200	200	200	100	100	100	100	100 SF
Food/Beverage; Secure	39,320 SF	24,300	30,000	32,100	34,700	37,800	15,020	9,320	7,220	4,620	1,520 SF
News/Gift/Retail; Secure	12,610 SF	19,400	24,000	25,700	27,800	30,300	(6,790)	(11,390)	(13,090)	(15,190)	(17,690) SF
Subtotal; Secure Concessions	51,930 SF	43,700	54,000	57,800	62,500	68,100	8,230	(2,070)	(5,870)	(10,570)	(16,170) SF
Food/Beverage; Non-Secure	0 SF	2,700	3,300	3,600	3,900	4,200	(2,700)	(3,300)	(3,600)	(3,900)	(4,200) SF
News/Gift/Retail; Non-Secure	580 SF	2,200	2,700	2,900	3,100	3,400	(1,620)	(2,120)	(2,320)	(2,520)	(2,820) SF
Subtotal; Non-Secure Concessions	580 SF	4,900	6,000	6,500	7,000	7,600	(4,320)	(5,420)	(5,920)	(6,420)	(7,020) SF
Duty Free (not identified on plans)	0 SF	5,300	6,700	7,500	8,500	9,700	(5,300)	(6,700)	(7,500)	(8,500)	(9,700) SF
Other Services (not identified on plans)	0 SF	2,900	3,600	3,800	4,200	4,500	(2,900)	(3,600)	(3,800)	(4,200)	(4,500) SF
Concession Support Area	7,960 SF	14,200	17,600	18,900	20,600	22,500	(6,240)	(9,640)	(10,940)	(12,640)	(14,540) SF
Subtotal	60,770 SF	71,200	88,100	94,700	103,000	112,600					SF
OTHER PUBLIC AREAS											
Public Seating and Meeter/Greeter Lobbies	12,800 SF	4,900	6,300	7,600	8,300	9,000	7,900	6,500	5,200	4,500	3,800 SF
Restrooms - Terminal Locations	3,550 SF	6,600	8,400	10,200	11,000	12,000	(3,050)	(4,850)	(6,650)	(7,450)	(8,450) SF
Restrooms - Concourse Locations	12,380 SF	8,600	10,100	11,200	12,000	13,400	3,780	2,280	1,180	380	(1,020) SF
Subtotal	28,730 SF	20,100	24,800	29,000	31,300	34,400					SF
Vacant spaces suitable for: airline offices	34,400 SF										SF

[1] - Sources:
Silvester + Tafuro Architects - architectural plans, April 2005
DMJM Aviation - occupancy analysis, February 2005
Hirsh Associates site visit, December 2005
Hirsh Associates Analysis
[2] - 2004 activity for Terminals 8 & 9

Table I.3-2
JFK – Terminal Specific Variables

	Terminals 1	2/3	4	5	6	7	8	
Domestic ATO Counters								
Conventional Staffed Positions	NA	30%	15%	25%	34%	35%	30%	of pass. use staffed counters
	NA	29%	32%	38%	38%	31%	35%	of pk hr pass. enter in peak 30 min.
	NA	1.0	2.0	1.0	1.0	1.2	1.2	airline exclusivity factor
Self-Service Kiosks	NA	40%	85%	45%	37%	50%	45%	of pass. use kiosks
Ticket Lobby Depth	NA	45	80	55	55	45	45	feet
International ATO Counters								
Conventional Staffed Positions	Y	N	Y	NA	NA	N	N	CUTE counters assumed?
	100%	80%	100%	NA	NA	80%	80%	of pass. use staffed counters
	NA	25%	NA	NA	NA	30%	28%	of pk hr pass. enter in peak 30 min.
	NA	1.3	NA	NA	NA	1.3	1.2	airline exclusivity factor
Self-Service Kiosks	NA	15%	NA	NA	NA	15%	15%	of pass. use kiosks
Ticket Lobby Depth	95	50	80	NA	NA	80	80	feet
Domestic Baggage Claim								
Claim Frontage Demand	0%	65%	65%	55%	55%	65%	65%	of pass. with checked bags
	0%	51%	50%	47%	60%	71%	50%	of pk hr pass. arrives in pk 20 min.
	2.2	2.2	1.6	2.0	2.0	1.6	1.9	avg. party size
Average Claim Unit Size	170	170	170	170	170	180	220	LF/unit
International Baggage Claim								
Claim Frontage Demand	90%	90%	90%	0%	0%	90%	90%	of pass. with checked bags
	52%	50%	45%	0%	0%	60%	56%	of pk hr pass. arrives in pk 20 min.
	2.0	2.1	1.8	NA	NA	2.2	2.0	avg. party size
	1.0	1.2	1.0	NA	NA	1.0	1.0	flight arrival concentration adjust factor
Average Claim Unit Size	220	200	220	NA	NA	200	280	LF/unit
Airline Space								
Airline Operations & Offices (excluding ATO)	1,600	2,400	2,080	4,300	4,300	2,100	2,800	SF/EQA
Make-up capacity (carts or LD3s)	3	3	3	4	4	3	3	/EQA
Baggage Make-up area	260	400	400	300	300	400	270	SF/cart
Checked Bags/pax for EDS screening	1.1	1.1	1.1	1.1	1.1	1.1	1.1	domestic
	1.5	1.5	1.5	1.5	1.5	1.5	1.5	int'l
Airline Clubs & 1st/Bus. Class Lounges	23,743	10,048	10,806	0	0	21,842	9,124	SF/million enpl (existing ratio)
Baggage Service Offices	2.0	2.0	2.0	1.2	1.2	1.5	1.5	SF/pk hr dep dom o&d+int'l total pass.
Concessions								
% located in secure area	60%	90%	60%	90%	90%	90%	90%	
Food/Beverage planning factor	6.1	6.5	6.0	5.4	5.4	6.5	6.5	SF/1,000 annual enplaned pax
News/Gift/Retail planning factor	5.1	5.2	4.8	4.4	4.4	5.2	5.2	SF/1,000 annual enplaned pax
Duty Free planning factor	3.2	2.7	3.1	0.0	0.0	2.7	2.7	SF/1,000 annual enplaned pax
Other services planning factor	1.0	0.7	2.0	0.7	0.7	0.5	0.7	SF/1,000 annual enplaned pax
Concession Support Area	30%	25%	30%	25%	25%	25%	25%	of concession space
Other Public Areas								
Public Seating and Meeter/Greeter Lobbies	5%	15%	20%	10%	10%	10%	10%	seating for __% of pass. & visitors

Table I.3-3
LGA – Terminal Specific Variables

	Terminals				
	CTB	DL / NW	DL shuttle	US	
Domestic ATO Counters					
Conventional Staffed Positions	35%	20%	45%	30%	of pass. use staffed counters
	42%	33%	54%	38%	of pk hr pass. enter in peak 30 min.
	1.6	1.6	1.0	1.0	airline exclusivity factor
Self-Service Kiosks	40%	40%	45%	50%	of pass. use kiosks
Ticket Lobby Depth	50	50	40	45	feet
International ATO Counters					
Conventional Staffed Positions	NA	NA	NA	NA	CUTE counters assumed?
	NA	NA	NA	NA	of pass. use staffed counters
	NA	NA	NA	NA	of pk hr pass. enter in peak 30 min.
	NA	NA	NA	NA	airline exclusivity factor
Self-Service Kiosks	NA	NA	NA	NA	of pass. use kiosks
Ticket Lobby Depth	NA	NA	NA	NA	feet
Domestic Baggage Claim					
Claim Frontage Demand	75%	75%	20%	60%	of pass. with checked bags
	50%	50%	67%	62%	of pk hr pass. arrives in pk 20 min.
	2.1	2.2	1.5	1.8	avg. party size
Average Claim Unit Size	170	200	170	170	LF/unit
International Baggage Claim					
Claim Frontage Demand	0%	0%	0%	0%	of pass. with checked bags
	0%	0%	0%	0%	of pk hr pass. arrives in pk 20 min.
	NA	NA	NA	NA	avg. party size
	NA	NA	NA	NA	flight arrival concentration adjust factor
Average Claim Unit Size	NA	NA	NA	NA	LF/unit
Airline Space					
Airline Operations & Offices (excluding ATO)	2,400	2,800	1,700	2,700	SF/EQA
Make-up capacity (carts or LD3s)	2	2	2	2	/EQA
Baggage Make-up area	600	500	600	600	SF/cart
Checked Bags/pax for EDS screening	1.1	1.1	1.1	1.1	domestic
	1.5	1.5	1.5	1.5	int'l
Airline Clubs & 1st/Bus. Class Lounges	4,362	3,048	0	3,735	SF/million enpl (existing ratio)
Baggage Service Offices	1.5	2.0	1.0	1.5	SF/pk hr dep dom o&d+int'l total pass.
Concessions					
% located in secure area	90%	90%	90%	90%	
Food/Beverage planning factor	4.2	5.1	3.9	5.1	SF/1,000 annual enplaned pax
News/Gift/Retail planning factor	3.3	4.0	2.9	4.0	SF/1,000 annual enplaned pax
Duty Free planning factor	0.0	0.0	0.0	0.0	SF/1,000 annual enplaned pax
Other services planning factor	0.7	0.7	0.7	0.7	SF/1,000 annual enplaned pax
Concession Support Area	25%	25%	25%	25%	of concession space
Other Public Areas					
Public Seating and Meeter/Greeter Lobbies	5%	5%	5%	5%	seating for __% of pass. & visitors

Table I.3-4
EWR – Terminal Specific Variables

	Terminals A	Terminals B	Terminals C	
Domestic ATO Counters				
Conventional Staffed Positions	35%	35%	35%	of pass. use staffed counters
	40%	35%	40%	of pk hr pass. enter in peak 30 min.
	1.5	1.5	1.0	airline exclusivity factor
Self-Service Kiosks	40%	35%	35%	of pass. use kiosks
Ticket Lobby Depth	45	45	50	feet
International ATO Counters				
Conventional Staffed Positions	N	Y	N	CUTE counters assumed?
	70%	100%	65%	of pass. use staffed counters
	29%	NA	29%	of pk hr pass. enter in peak 30 min.
	1.0	NA	1.0	airline exclusivity factor
Self-Service Kiosks	30%	NA	35%	of pass. use kiosks
Ticket Lobby Depth	45	50	50	feet
Domestic Baggage Claim				
Claim Frontage Demand	65%	65%	65%	of pass. with checked bags
	46%	47%	41%	of pk hr pass. arrives in pk 20 min.
	1.8	2.2	2.1	avg. party size
Average Claim Unit Size	170	170	190	LF/unit
International Baggage Claim				
Claim Frontage Demand	0%	90%	90%	of pass. with checked bags
	0%	50%	50%	of pk hr pass. arrives in pk 20 min.
	NA	2.1	2.3	avg. party size
	NA	1.1	1.2	flight arrival concentration adjust factor
Average Claim Unit Size	NA	215	230	LF/unit
Airline Space				
Airline Operations & Offices (excluding ATO)	3,000	1,800	2,800	SF/EQA
Make-up capacity (carts or LD3s)	2	3	4	/EQA
Baggage Make-up area	600	600	300	SF/cart
Checked Bags/pax for EDS screening	1.1	1.1	1.1	domestic
	1.5	1.5	1.5	int'l
Airline Clubs & 1st/Bus. Class Lounges	6,107	11,291	5,284	SF/million enpl (existing ratio)
Baggage Service Offices	2.0	2.0	1.8	SF/pk hr dep dom o&d+int'l total pass.
Concessions				
% located in secure area	90%	80%	90%	
Food/Beverage planning factor	5.1	5.1	5.7	SF/1,000 annual enplaned pax
News/Gift/Retail planning factor	4.1	4.1	4.4	SF/1,000 annual enplaned pax
Duty Free planning factor	1.5	2.9	2.1	SF/1,000 annual enplaned pax
Other services planning factor	0.7	0.7	0.7	SF/1,000 annual enplaned pax
Concession Support Area	25%	25%	25%	of concession space
Other Public Areas				
Public Seating and Meeter/Greeter Lobbies	5%	15%	5%	seating for __% of pass. & visitors

Ticketing and Check-in

Passengers may check in for flights at various locations depending on the type of travel (domestic or international), the terminal and airline. These include conventional staffed counters, self-service units (kiosks), curbside, and internet check-in. Of these options, conventional positions and kiosks occupy space within the terminal and are considered determinants of capacity. Because characteristics vary between domestic and international passengers, check-in requirements have been projected separately.

Check-in Positions

The methodology includes the following factors:

- The percentage of passengers using conventional counters and kiosks (from the passenger survey).
- It has been assumed that the percentage of domestic passengers using kiosks and electronic check-in will increase as people become more familiar with the technology. It has also been assumed that some additional international airlines will introduce kiosk check-in for a limited number of passengers. The existing and projected utilizations of conventional counters and kiosks are as follows. Note that these do not include passengers using curbside and/or internet check-in.

Airport / Terminal		Existing		Future	
		ATO	kiosk	ATO	kiosk
LGA:					
	CTB	44%	32%	35%	40%
	Delta	24%	36%	20%	40%
	Delta Shuttle	51%	45%	45%	45%
	US Airways	35%	46%	30%	50%
JFK:					
	T-3 domestic	39%	34%	30%	40%
	T-4 domestic	15%	85%	15%	85%
	T-5 domestic	34%	37%	25%	45%
	T-7 domestic	40%	46%	35%	50%
	T-8 domestic	37%	37%	30%	45%
	T-3 int'l	90%	5%	80%	15%
	T-7 int'l	85%	11%	80%	15%
	T-8 int'l	91%	6%	80%	15%

Airport / Terminal	Existing		Future	
	ATO	kiosk	ATO	kiosk
EWR:				
T-A domestic	48%	31%	35%	40%
T-B domestic	40%	28%	35%	35%
T-C domestic	40%	28%	35%	35%
T-A int'l	100%	0%	70%	30%
T-C int'l	80%	20%	65%	35%

- Processing times per passenger based on observations during August 2005.

  A total of 169 domestic transactions and 97 international transactions involving 236 and 167 passengers respectively were observed at LGA and JFK. Processing times were similar to those obtained by the consultant at other airports with similar types of activity.

  Processing times used reflect the 80th percentile; that is 80% of the passengers were checked-in in x minutes or less. This is considered a realistic level of service parameter for peak conditions. The 80th percentile times per passenger are:

	min./pax.
Domestic staffed counter*	2.8
Domestic kiosk	2.6
International staffed counter*	3.8
International kiosk (limited sample)	2.6

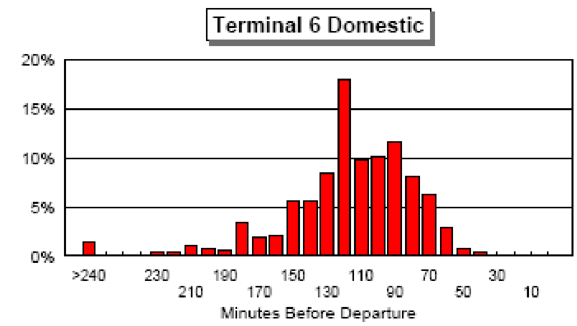
  * Delta Shuttle check-in times are 1.5 minutes/passenger; Air Canada check-in times are same as domestic.

  It has been assumed that as passengers become more familiar with kiosk operations the times per passenger will decline to 2.0 minutes/passenger by 2010. Other processing times are assumed not to change.

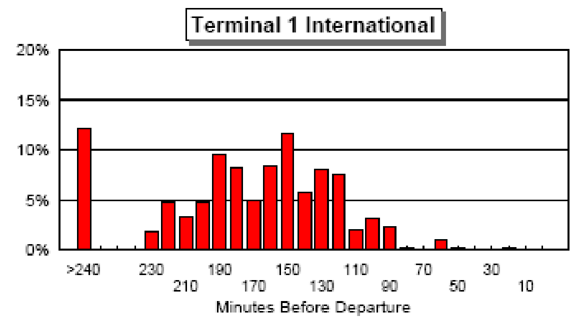
- The percentage of passengers arriving within a 30 minute peak (derived from the passenger survey).

  This varies from 30-45% for domestic passengers to 25-30% for international passengers. These arrival time distributions are illustrated in Exhibits I.3-2 through I.3-4. The arrival time curves may shift over time, but the percentage within a peak 30 minutes is assumed to remain constant.

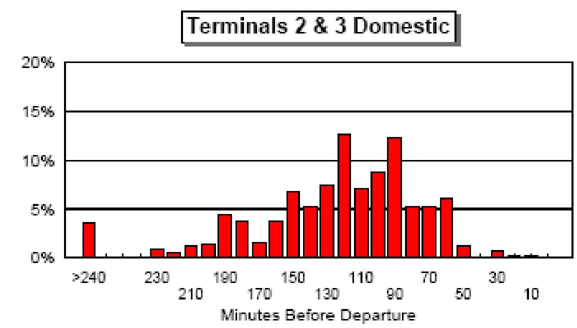
Exhibit I.3-2
JFK – Passenger Arrival Time Distribution
2005 Air Passenger Survey



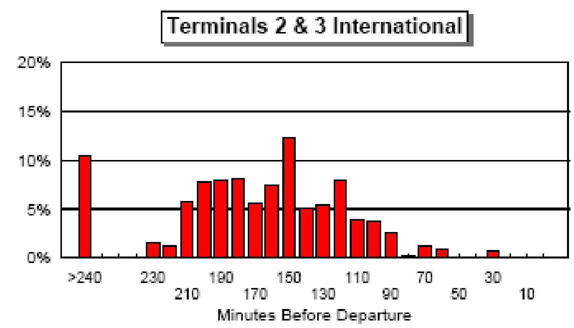
Max 30 minutes: 38%
From 91 to 120 min before STD



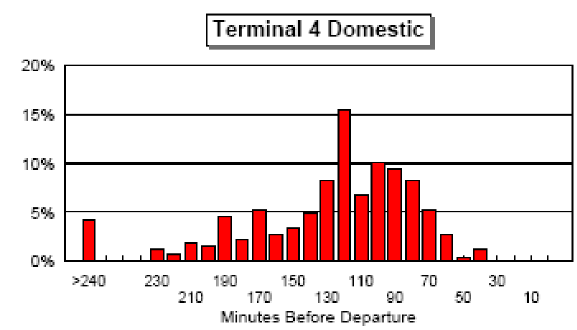
Max 30 minutes: 26%
From 131 to 160 min before STD



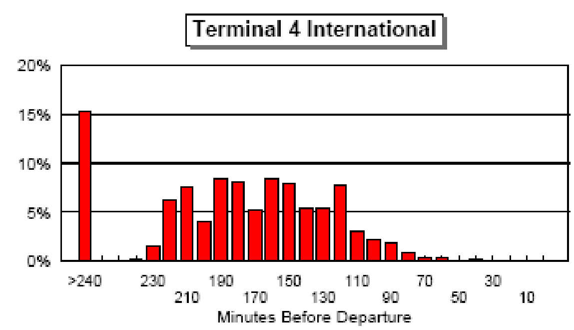
Max 30 minutes: 29%
From 91 to 120 min before STD



Max 30 minutes: 25%
From 141 to 170 min before STD

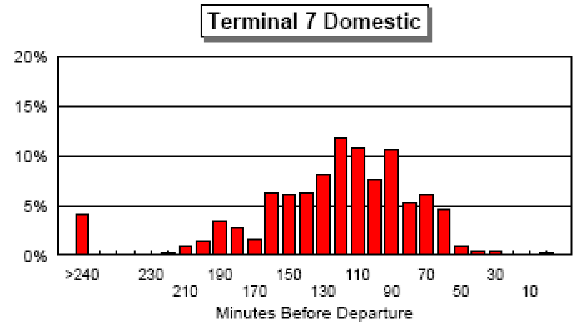


Max 30 minutes: 32%
From 91 to 120 min before STD

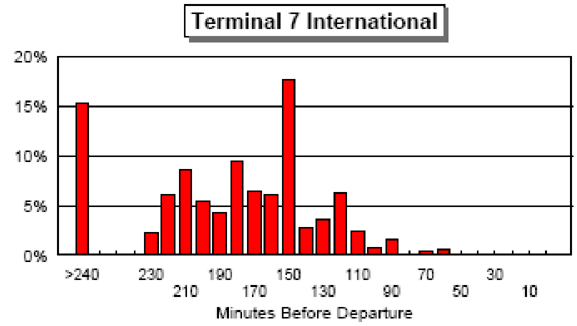


Max 30 minutes: 22%
From 161 to 190 min before STD

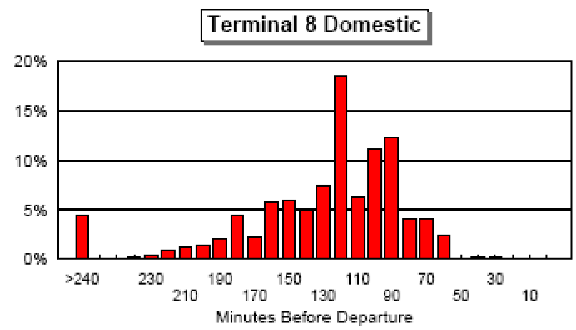
Exhibit I.3-2 (Con't)
JFK – Passenger Arrival time Distribution
2005 Air Passenger Survey



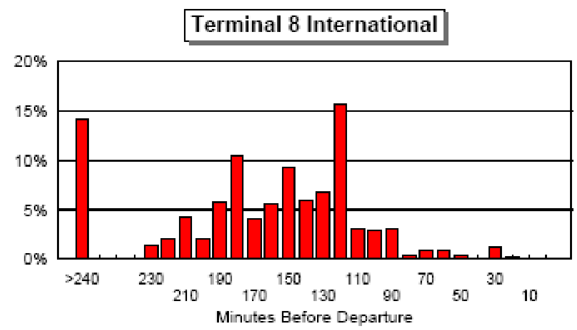
Max 30 minutes: 31%
From 101 to 130 min before STD



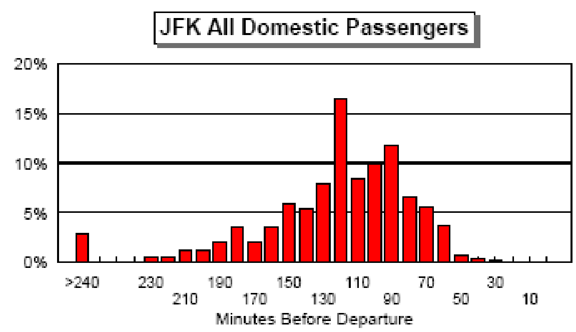
Max 30 minutes: 30%
From 141 to 170 min before STD



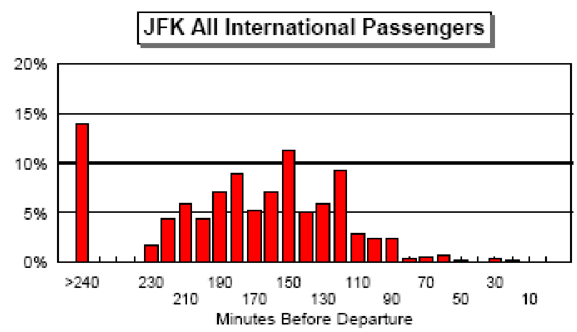
Max 30 minutes: 36%
From 91 to 120 min before STD



Max 30 minutes: 28%
From 111 to 140 min before STD



Max 30 minutes: 35%
From 91 to 120 min before STD



Max 30 minutes: 24%
From 141 to 170 min before STD

Exhibit I.3-3
LGA – Passenger Arrival time Distribution
2005 Air Passenger Survey

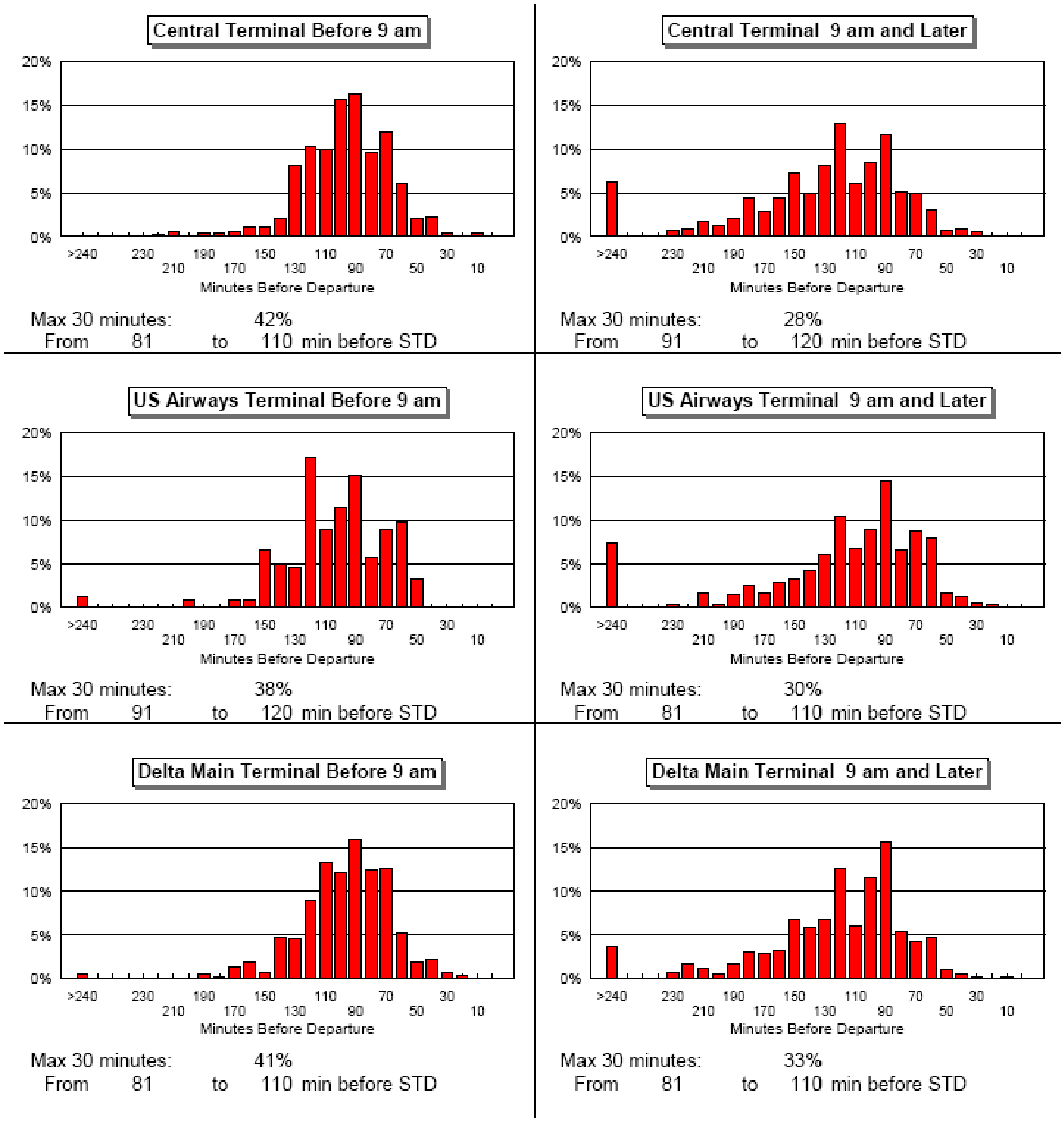
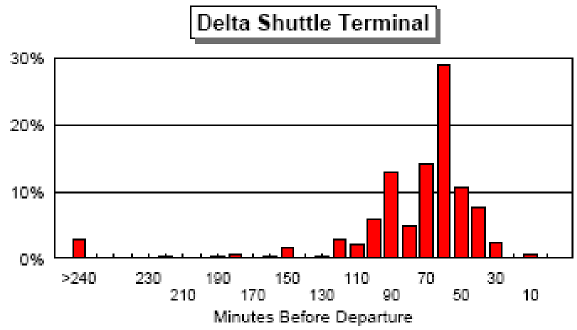
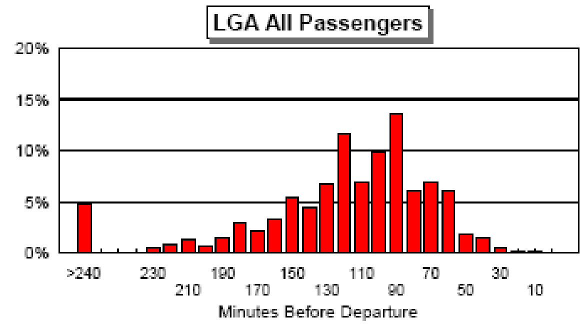


Exhibit I.3-3 (Con't)
LGA – Passenger Arrival time Distribution
2005 Air Passenger Survey

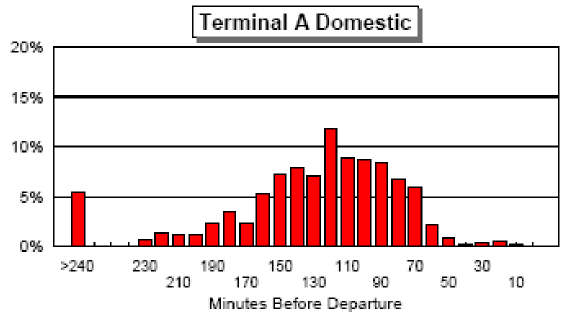


Max 30 minutes: 54%
From 41 to 70 min before STD

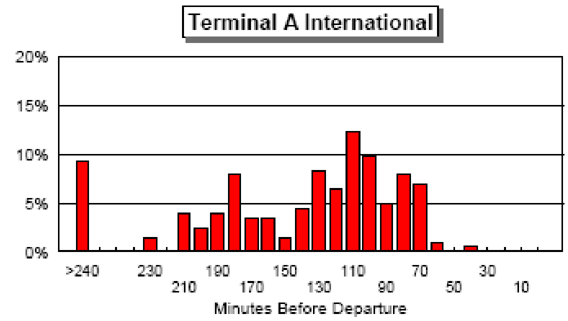


Max 30 minutes: 30%
From 81 to 110 min before STD

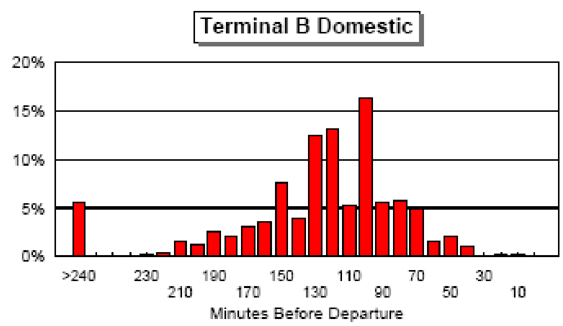
Exhibit I.3-4
EWR – Passenger Arrival time Distribution
2005 Air Passenger Survey



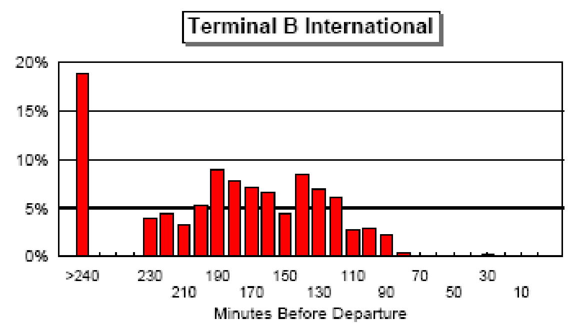
Max 30 minutes: 29%
From 91 to 120 min before STD



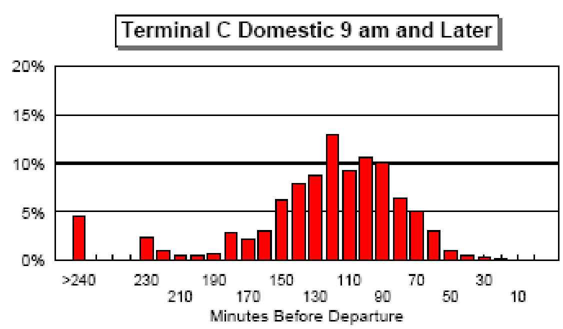
Max 30 minutes: 29%
From 91 to 120 min before STD



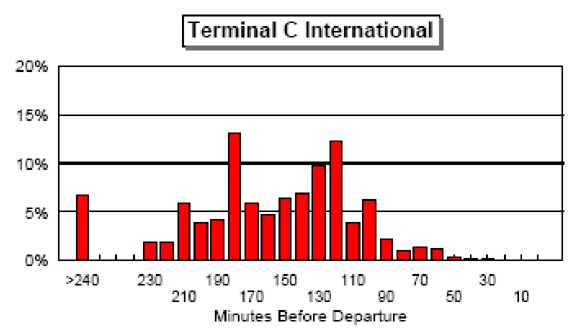
Max 30 minutes: 35%
From 91 to 120 min before STD



Max 30 minutes: 24%
From 161 to 190 min before STD

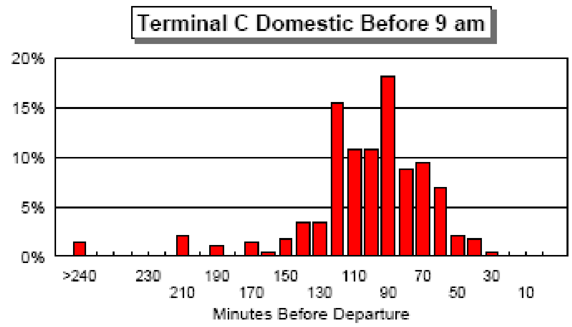


Max 30 minutes: 33%
From 91 to 120 min before STD

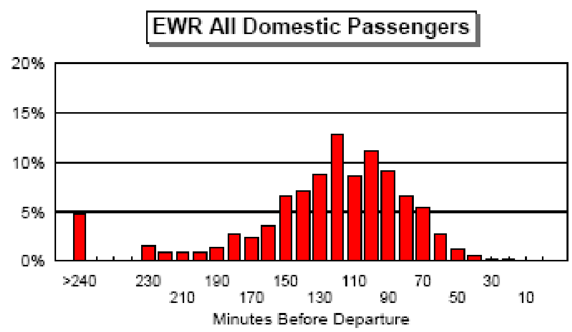


Max 30 minutes: 29%
From 111 to 140 min before STD

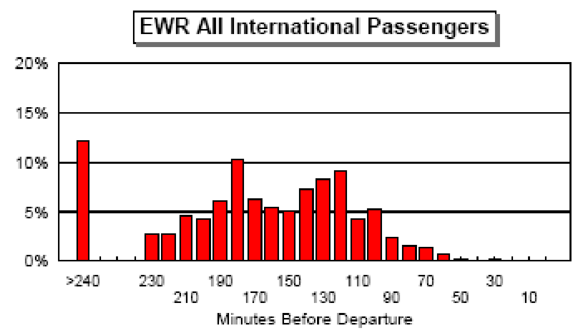
Exhibit I.3-4 (Con't)
EWR – Passenger Arrival time Distribution
2005 Air Passenger Survey



Max 30 minutes: 40%
From 81 to 110 min before STD



Max 30 minutes: 32%
From 91 to 120 min before STD



Max 30 minutes: 25%
From 111 to 140 min before STD

- Domestic carriers in shared terminals are assumed to have exclusive counters.

  The number of staffed counters required to accommodate the 30 minute peak passenger loads has been increased to reflect the number of airlines in a terminal.

- The number of kiosks has been increased by 50% over those required to accommodate the 30 minute peak passenger loads, as well as for the number of airlines.

  This reflects airline efforts to improve passenger service with more kiosks so as to reduce or eliminate queues for kiosk users. The introduction of common use self-service (CUSS) kiosks has not been assumed at this time.

- International carriers in shared terminals (T-1, T-4 and T-B) are assumed to use CUTE (Common Use Terminal Equipment) counters.

  These are assigned based on the seating capacity of each flight, with counters available up to 4 hours before scheduled departure time for JFK (practice of T-4 operator) and 3 hours for EWR Terminal B (PANYNJ policy). An example of CUTE counter assignments is included as Exhibit II-8 for T-4 in 2015.

The combined total of staffed positions and kiosks is the number of equivalent check-in positions. Because airlines have different preferences for kiosk location and configurations (in-line with the counter; islands; clusters; or remote from the check-in counter), converting equivalent positions to linear counter frontage varies by terminal. It has been assumed that the existing ratio of equivalent positions to linear positions will be maintained in the future.

Check-in Counter Length and Area

The length of the check-in counter has been calculated based on 5 LF per position for typical domestic counters. Wider positions have been assumed for international counters and those domestic airlines using powered bag take-back belts (typically 6 LF). Ticket counters are assumed to be 10' deep for conventional counters, and 14' deep for those with powered take-back belts. For recently constructed or renovated terminals, existing counter widths and depths have been assumed.

Ticket Lobby

The ticket lobby includes check-in counter queuing area and cross circulation. Seating and entry vestibules should be outside this zone. The dimension from the face of the ticket counter to any obstruction to cross circulation should be between 45' and 55' for most of the terminals at the PANYNJ airports. This would provide adequate queuing for typical peak passenger loads. When an "island" counter configuration is present (such as Terminals 1, 4, 7 and 8 at JFK), the combined separation is reduced by the 15-20' central circulation zone. The ticket lobby area in the tables includes an allowance for additional circulation at the ends of the counters.
The location of self-service kiosks can affect ticket lobby depths. Although increased use of kiosks should reduce queue lengths (and airline staffing), placement of these units may not result in reducing ticket lobby depths. Due to continuing evolution of self-service concepts, changes in recommended ticket lobby depths cannot be made at this time.

Holdrooms and Secure Circulation

Security Screening Checkpoints (SSCP)

All passengers must be inspected for weapons and other prohibited items before entering the secure gate areas of the terminals. Since 2001 (and prior at some PANYNJ terminals), only ticketed passengers with boarding passes are allowed through security. Although this could change in the future, current policies have been assumed to continue.

The number of SSCP lanes has been projected based on an average processing rate of 180 passengers/hour/lane. This rate is based on activity data at LGA for July 2005 provided by the TSA, and is consistent with processing rates measured by the consultant at other US airports. As at most airports, processing rates can vary greatly by time of day, the experience of passengers with screening procedures, and the ability of the personnel on duty. This can lower rates to as little as 130-140 passengers/hour/lane and result in delays. Checkpoint lanes have been based on a peak 30 minute demand to be consistent with check-in counter demands.

The current TSA module of one walk-thru metal detector and one carry-on bag X-ray unit occupies an area of approximately 750 SF per lane. This includes equipment, passenger inspection, and space for passengers to repack any carry-on items which may have been opened at the checkpoint. A queue length of 20' has been assumed. An allowance of 25% has been added for exiting lanes, search rooms and TSA offices at the checkpoint for a total of 1,310 SF per lane. Many SSCP locations at PANYNJ airports are in locations where TSA standards cannot currently be met.

The TSA is testing new equipment such as body scanners and other types of explosive detection equipment in an effort to improve screening and reduce delays. Some of this equipment may require additional area, but if processing rates can be increased, fewer lanes may be required. For purposes of this capacity analysis, no changes have been assumed in either processing rates or area per lane.

Secure Circulation

Secure circulation typically consists of the main corridor of the concourse and adjacent egress stairs on the holdroom level. The corridor width is typically defined by holdroom seating as well as structural elements. Ancillary uses would be located outside of these corridors.

Generally accepted terminal planning guidelines recommend 30' wide double-loaded, and 20' single-loaded corridors for terminals not requiring moving walkways. Where moving walks are recommended due to longer walking distances, corridors are recommended to increase to 45' and 25' for double and single loaded concourses respectively. In special cases, such as an international-only concourse with predominantly single direction passenger flow, a narrower corridor may be acceptable. The recommended area is based on an area per equivalent concourse length determined by gates expressed as NBEG. Corridor width assumptions are listed on the Terminal Capacity Analysis table for each terminal.

FIS Sterile Circulation

Sterile circulation consists of the corridors and vertical circulation elements which connect international arrivals gates to the FIS facilities. These corridors are typically 15' wide to provide single direction flow; 20' with moving walkways.

Holdrooms

Holdrooms (Departure Lounges) are based on the mix of gates and the average seating capacity of each class of aircraft. The holdroom area consists of the passenger seating/lounge area; the airline's ticket lift podium; and circulation.

The amount of seating/lounge area is typically based on providing lounge area for 80% of the aircraft seating capacity. The PANYNJ has determined that seating should be provided for 90% of aircraft capacity at LGA to reflect scheduling patterns. Of these, the percentage of passengers seated varies from 50% to 80%, with the remaining 20% to 50% standing. The area per passenger for a 50% seated ratio corresponds to an IATA Level of Service (LOS) C, whereas an 80% seated ratio is LOS B. While achieving LOS B is a goal of the PANYNJ, LOS C for a single holdroom has been used for determining capacity.

Grouping could make it is possible to reduce the amount of holdroom seating area by 10%. For capacity estimates a reduction in the seating area has not been assumed due to the varying configurations of the terminals. It should be noted, however, that a single holdroom sized for LOS B when reduced by 10% is equivalent in seating area to a holdroom sized for LOS C. Therefore, where holdrooms are grouped, the Study's single gate LOS C capacity methodology is equivalent to LOS B for grouped holdrooms, and thus in many cases meet the PANYNJ's goal of LOS B.

A 180 SF (6' wide) deplaning corridor has been added to the lounge area which assumes an average 30' deep holdroom. The corridor effectively acts as an extension of the 4-5' wide loading bridge door.

Each ticket lift podium position is allocated 5' for width, although many airlines use 3-4' wide positions. The depth of the podium and back wall is typically 8', and a 15' deep queuing area is provided, for a total of 115 SF per position. Podium positions are assumed to be as follows: one for regional/commuter aircraft (with a 10' deep queue for a total of 90 SF); two for Group III narrowbody aircraft; three for B757 and Group IV widebody aircraft; four for Group V aircraft; and 6 for the A380.

The average aircraft seating capacities and recommended holdroom sizes are (EWR & JFK):

	Seats	Area (SF)
Regional Jet (II)	50	800
Narrowbody (III)	145	1,850
B757 (IIIa)	185	2,400
Widebody (IV)	230	2,850
B747 (V)	380	4,450
A380 (VI)	550	6,400

For LGA the recommended sizes are:

	Seats	Area (SF)
Regional Jet (II)	50	850
Narrowbody (III)	145	2,050
B757 (IIIa)	185	2,600
Widebody (IV)	230	3,150

Domestic Baggage Claim

Baggage claim requirements are based primarily on design hour deplaned O&D passengers, the concentration of these arriving passengers within a 20 minute time period, percentage of passengers checking bags, average travelling party size, and - to a lesser extent - on checked baggage per passenger ratios. Observations at U.S. airports indicate that the majority of domestic passengers arrive at the baggage claim area before their bags are unloaded onto the claim units. The result is that the claim units should be sized for the estimated number of passengers waiting for baggage, because most bags are claimed on the first revolution of the claim unit.

The methodology includes the following factors:

- The analyses of flight schedules (Section II) provided statistics of peak 20 minute arriving seats. These vary considerably by terminal. Most are in the range of 45-60% of design hour deplanements. LGA terminals range from 60 to 67%. JetBlue has a more concentrated hubbing pattern with 78% of design hour arrivals, and JFK T-7 is at 94% due to limited numbers of peak hour domestic flights.

- The percentages of passengers who check bags and average travelling party sizes were determined from the 2005 departing passenger surveys. It has been assumed that arriving passengers have similar characteristics.

- In projecting the required frontage of a claim unit, it has been observed by the consultant that not all members of a travelling party are actively claiming bags. Thus, claim frontage has been reduced compared to the total number of passengers with checked bags. Total claim frontage is calculated based on 1.5 LF per person actively claiming bags (LOS C).

- Average recommended claim unit size has been estimated based on typical aircraft sizes and load factors during peak periods, and the number of flights. For most domestic terminals 170 LF claim units are recommended. These can accommodate single arrivals by B757 or small WB aircraft, and multiple flights by smaller NB or regional aircraft. Single airline terminals may use larger claim units where mixing of flights is less of an issue.

- Baggage claim area is 30 SF/LF of frontage for flat plate claim units; and 35 SF/LF of frontage for sloped bed claim units for most terminals. This area will typically allow 30' separations between claim units and 15' to adjacent uses. If bag trolleys are staged between claim units (as in some international terminals), additional area is required to maintain adequate circulation space.

Federal Inspection Services Facilities

Federal Inspection Services (FIS) consist of the U.S. government agencies responsible for inspecting all international arriving passengers[2]. In these procedures, all passengers are subject to primary inspection by U.S. Customs and Border Protection (CBP). The CBP incorporates the inspection functions formerly done by the Immigration and Naturalization Service (INS), Customs (USCS) and Agriculture (APHIS). Secondary passenger inspection is based on more selective procedures using computer based lists of passengers, roving agents, designations of 'high-risk' and 'low-risk' flights and other targeting techniques. Although there is a national policy, implementation may vary at each gateway based on local conditions.

FIS facilities are sized for a capacity stated in terms of passengers per hour. This is a 'steady state' rating assuming a relatively well distributed pattern of arriving flights. The CBP has drafted revised facilities requirements based on integration of offices and support spaces. The draft standards significantly reduces the amount of office and support space for smaller capacity facilities[3].

For the purposes of this Study, only the two facilities which directly affect passenger processing capacity have been considered: primary passenger inspection, and baggage claim. Although secondary inspection facilities for passengers and baggage (customs/agriculture) are required, and can occupy a significant amount of space, these only impact a relatively low percentage of passengers and vary significantly by terminal.

Under the revised standards, one double primary inspection counter (2 agents) is rated at an average of 120 passengers per hour. Most terminals have separate queues for U.S. citizens, and for foreign nationals, each of which will have a different average processing rate. For capacity analysis, the CBP base capacity has been used. Federal policy requires that all passengers clear FIS at their first point of entry into the U.S. Therefore design hour deplaned total international passengers (O&D and connecting) are used to determine demand.

The primary inspection counter and queuing program area includes a standard double inspection booth, a 77' deep queuing/circulation area, and a 12' deep cross circulation/exit area after the inspection booths. Additional circulation prior to the queue may be required depending on passenger flow from the sterile corridors into the primary processing area.

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2 All flights from Canada are assumed to be pre-cleared and are included in domestic deplaned passengers.

3 Airport Technical Design Standards; U.S. Customs and Border Protection; March 2005 Review Draft.

International baggage claim demand has been estimated with a methodology similar to that for domestic baggage claim, i.e. percentage of design hour passengers arriving in a 20 minute period (45-70%); percentage of passengers with checked bags (assumed at 90%); and average party size (1.8-2.3 passengers).

The difference for international baggage claim is the amount of delay at primary inspection which can cause some passengers to arrive at the claim unit after bags begin to be delivered. This increases the time a claim unit is in use for a specific flight and necessary bag storage capacity. Depending on the number of flights arriving within the 20 minute period, walking distances from gate to FIS, and nationality percentages, multiple flights of passengers can become mixed in the primary inspection resulting in staggered arrivals of passengers in baggage claim for a specific flight.

These scenarios can be modelled, but it requires flights to be assigned to specific gates which has not been done as part of this Study. Based on the Consultant's experience with modeling other FIS facilities serving both O&D and hubbing airlines, an arrival concentration factor has been applied to account for these conditions. This concentration factor typically increases the amount of baggage claim 10-20% compared to a domestic claim with similar characteristics. In the case of EWR T-C, the hubbing schedule requires 50% more baggage claim than a domestic claim.

Although sloped bed claim units can have greater bag storage capacity than flat plate units (and are typically favored in most international terminals for these and other reasons), utilizing this capacity requires staff to stand up bags as they emerge from the delivery conveyor. Thus, claim frontage demand is projected based on the number of passengers actively claiming bags in the same way as domestic passengers.

Average claim unit sizes are assumed to be 200-220 LF for most terminals. For newer terminals, the average existing size has been maintained. Larger claim units may be provided where airline/passenger characteristics have unusually high baggage claim demand, and/or provisions are made for accommodating the A380.

Airline Space -

Airline space includes both exclusive leased areas (for example offices, operations and clubs), and joint use space (such as baggage handling).

Airline Offices

Airline Offices include the ATO offices and other airline administrative spaces. The ATO offices are usually located immediately behind, or adjacent to the ATO counter to provide support functions for the ticket agents. Typically these are 30' deep along the length of the counter. In most terminals using island counter configurations or where terminal depth does not permit adjacent ATO offices, these functions may be located elsewhere. For capacity comparison purposes, a typical behind the counter location has been assumed, and areas were projected based on ATO counter length. As airlines change to more self-service operations, it is possible that the amount of space which needs to be located immediately adjacent to the ATO will be reduced.

Other offices may include functions such as the airline station manager or a sales office. The amount of these offices and location (ATO, operations area, office location on a terminal upper level, etc.) is dependent on individual airline requirements and preferences, and space availability.

Airline Operations

Operations typically include all of the apron level support spaces for aircraft servicing, and aircraft crew related support spaces. The demand for operations areas is a function of the size and types of aircraft being operated and individual airline operating policies. A program area for operations is typically based on the number of gates (as expressed in EQA) and airlines in a terminal. At airline hub terminals, there may be additional operations related functions on other levels of the terminal.

In some terminals it was not possible to separate and identify ATO, other offices and operations functions. For capacity comparison purposes, these three areas should be considered in the aggregate. A combined planning factor for operations and offices was developed for each terminal based on existing areas, the consultant's understanding of the adequacy of existing spaces, and comparisons to factors from other airports.

Baggage Handling

Baggage handling includes manual or automated make-up units, the cart/container staging areas, baggage tug/cart (baggage train) maneuvering lanes, checked baggage screening systems, and off-load areas for baggage claim units.

Although checked baggage ratios are a consideration, these generally affect the total number of baggage carts/containers in use rather than the size of the make-up area. The number of carts/containers staged at any one time, however, are generally based on the size of the aircraft. Using EQA provides a consistent basis for baggage system planning and capacity analysis, since larger widebody aircraft require more bag cart/container staging area than smaller aircraft. The number of staged carts/containers is also a function of individual airline policies for pre-sorting baggage at a spoke airport for more efficient transfer at their hub. International flights also require more staged carts/containers than domestic due to separation of bags by cabin class. For capacity analysis the following staging assumptions have been used: 2 carts or LD3s per EQA for domestic spoke airlines; 3 per EQA for international; and 4 per EQA for hub terminals.

The recommended area has been based on the types of baggage make-up systems currently in each terminal using three basic types: pier sortation, common use recirculating make-up units, or exclusive use make-up units. Based on typical bag make-up systems, the following areas per staged cart or LD3 have been used: 300 SF for high efficiency pier sortation systems; 400 SF for common use manual systems; and 600 SF for individual airline manual systems. In selected terminals with new make-up systems, the existing area per staged cart/LD3 has been used.

It has been assumed that checked baggage screening by explosives detection systems (EDS) will be conducted by some form of in-line installation in the long term. Existing in-line systems (L3 or GE/Invision) presently can handle approximately 400 bags per hour. It is recognized that technologies will likely change, however, for the purpose of estimating terminal capacity, current systems and protocols have been assumed.

The number of EDS units has been based on the 30 minute peak check-in volumes used for ticket counters and security screening. The 2005 passenger survey did not provide data on the number of checked bags per passenger. Based on the Consultant's experience at other airports, it has been assumed that originating domestic passengers check an average of 1.1 bags, and international passengers 1.5 bags.

The area for in-line systems is also quite variable depending on the degree of existing baggage sortation automation, conveyor configurations, and building structure limitations. Based on typical installations at other large airports, an average of 3,200 SF per in-line module has been assumed for the EDS unit, Level 3 ETD inspection areas, and feed/re-sort conveyors. Existing ticket lobby EDS equipment was not included as existing conditions under the assumption that these will eventually be relocated to an operations area and the lobby returned to its intended use.

Baggage claim off-load includes: the portion of a flat plate, direct feed claim unit upon which the bags are placed, or the feed conveyor for a remote-fed claim unit; the adjacent baggage train lane and work area; and a by-pass lane for baggage trains. The planning area of 2,500 SF per claim unit is based on providing adequate space for the off-loading and bypass lanes for a baggage train of 4 carts or single container dollies.

V.I.P Lounges and Airline Clubs

Clubs and lounges include exclusive use membership clubs run by individual airlines, and First/Business Class lounges typically provided by international carriers. Airlines provide club facilities based on their individual criteria for level of passenger activity; type of market (business vs leisure); the number of club members in a given airport market area, etc. Airline clubs and lounges should be located within the secure area of the terminal, and airlines often want to locate clubs close to their gates. Sharing of clubs and lounges can occur with airline alliances, or where a number of smaller international airlines' schedules are compatible.

Although not a direct determinant of passenger processing capacity, the capability to provide club and lounge space can affect the types of airlines which would use a terminal. For the purpose of this Study, the existing area per million enplaned passengers has been established for each terminal. This factor has been held or adjusted for the future based on the understood ability to serve current passenger volumes and number of airlines.

Baggage Service Offices

Baggage service offices are typically required only by airlines with sufficient activity to warrant staffing. In some terminals, the major airline in an alliance may provide baggage service for other carriers, thus reducing the total area required. Lower activity airlines will typically use baggage lock-up areas to store late or unclaimed baggage rather than staffed offices. The planning factor is based on design hour deplaned O&D passengers and includes area for both staffed offices and lock-up storage areas. This ranges from 1.2 to 2.5 SF per domestic terminating passenger and all deplaning international passengers.

Concessions

Terminal Concessions include all of the commercial, revenue-producing functions which serve the travelling public. In developing the concessions capacity analyses, planning factors have been developed to reflect passenger characteristics obtained from the 2005 passenger surveys. It is understood that more detailed concessions studies have been done by some terminal operators but these could not be obtained for this Study due to confidentiality considerations. It is also understood that the PANYNJ will be doing a concessions study for EWR Terminal B, but it was not completed in time to be included in this Study.

The approach used is based on a methodology originally developed by a principal of SI Partners, and now used by a number of other consultants. It should be noted that this methodology is usually customized to consider the unique qualities of a specific airport and its passengers. It is also usually modified to consider the specific concession goals established by airport management.

The methodology considers various passenger and facilities characteristics to develop preliminary area per passenger planning factors for food/beverage, retail and duty free. Sections II, III and IV contain tables which derive the planning factors for the individual terminals. This approach is suitable for a first cut estimate such as required for the Regional Study. However, it is not a substitute for a detailed concessions study which would more fully analyze revenue production, concession mixes, passenger characteristics and other terminal specific factors. The approach also does not factor in the wide ranges of revenue per square foot achieved at the various terminals for similar types of concessions. Therefore, for this Study the UF factors are only initial estimates of concessions potential and may be subject to significant change.

At the present time, the splits of concessions between secure and non-secure areas varies significantly by terminal. Those with a high percentage outside security were not considered a problem prior to 9/11 when security screening was faster. Passengers could stay in the non-secure area longer, or easily return to the non-secure area if a flight was delayed. With slower, more intensive screening and the prohibition of visitors past security, passengers are reluctant to stay in the non-secure area as long. Unless a delay is of a known, long duration, passengers are also reluctant to leave the holdroom to use concessions in the non-secure area.

The PANYNJ is recommending the following ranges of concessions distribution:

- Domestic terminals: 10% non-secure / 90% secure
- International terminals: 30-40% non-secure / 60-70% secure
- Mixed terminals: 10-20% non-secure / 80-90% secure, varying by the domestic/international mix

The following secure side percentages have been assumed for the food/beverage and news/gift/retail in each terminal:

JFK:	T-1, 4	60% secure
	all others	90%
LGA:	all	90%
EWR:	T-A, C	90%
	T-B	80%

Most of the terminals meet, or come close to, these targets for the percentage of secure existing concessions (if not the estimated demand for space) with the exception of EWR T-A and B; JFK T-1, T-2/3 and 4; and the LGA CTB.

Duty free goods may be purchased by departing passengers on international flights. The amount of duty free sales is highly dependent on the destination and nationality of passengers, with residents of Asian countries returning home typically spending the most, and departing U.S. residents the least.

Rental car companies at the three PANYNJ airports do not have staffed counters in the terminals, but instead rely on phone banks. Some other transportation services do have staffed counters in the terminals or utilize consolidated information counters. This has been assumed to continue in the future with one ground transportation/information counter per terminal.

Other services can cover a wide range of businesses including currency exchanges, ATM machines, insurance sales, rental office cubicles, etc.

Concession support consists of storage/receiving areas, preparation kitchens, employee lockers, loading docks and administrative offices. Service elevators and service corridors, where provided, are considered separately as non-public circulation. For capacity planning, 25-35% is typically used depending on the number of individual concessionaires, the availability of out-of-terminal support space, and the types of concessions. In computing existing support areas, it was often difficult to identify support from passenger service areas, thus the low end of the range has been used for most terminals.

Other Public Areas

Public Seating & Meeter-Greeter Lobbies

Public seating areas include general waiting areas near the ticket lobby and baggage claim areas. These are typically in non-secure areas of the terminal. Most airports have traditionally provided seating for approximately 15% of the design hour enplaned passengers and their visitors, plus visitors for the deplaning passengers.

Since 9/11, passenger activity patterns have changed. Because enplaning passenger well-wishers have been reduced to very small numbers in most domestic terminals, and passengers typically want to go through security as soon as possible, relatively little seating for enplaning passengers is now needed. Since security regulations now prohibit visitors from going beyond security, there is a need for domestic meeter-greeter areas located at concourse exits and the baggage claim area in addition to the traditional international meeter-greeter lobbies. In some international terminals, airlines can generate large numbers of well-wishers, as well as meeter-greeters. In these cases additional seating is needed for these departing passengers and visitors who may arrive very early for their flights.

A PANYNJ Passenger Satisfaction survey conducted in 2005 indicated that of originating passengers, the percentage of those having someone come into the terminal to see them off (well-wishers) ranged from 3.7% for the LGA Delta Shuttle terminal to 18.5% at JFK T-4. The average for well-wishers was 9.9% at EWR, 10.5% at JFK, and 6.8% at LGA. Similarly, locally arriving passengers having someone meet them in the terminal (meeter-greeters) ranged from 1% for the Delta Shuttle terminal to 36.2% for T-4. The average for meeter-greeters ranged was 7.5% at LGA, and 23.6% at both EWR and JFK.

A 2003 PANYNJ meeter-greeter & well-wisher study resulted in an average well-wisher party size (excluding the passenger) of 1.4 for the three airports. Meeter-greeter parties averaged 3.0 people. By combining these average party sizes with the percentages of O&D passengers with visitors in the terminal, a ratio of visitors per O&D passenger was computed. These ranged from 0.1 - 0.3 for well-wishers to 0.1 - 1.1 for meeter-greeters.

For the capacity analysis, seating and meeter-greeter areas have been combined. Area demands have been based on design hour deplaned O&D passengers and their visitors. Area for 5-20% of these passengers and visitors has been used depending on the type of activity.

Restrooms

Restrooms should have at least as many toilets for women as toilets and/or urinals for men. The PANYNJ is now requiring 25% more fixtures for women than for men which is consistent with many recent building codes. Most of the restrooms in the various terminals do not meet the equal number goal and few provide the additional 25%.

The base number of fixtures is taken from the New York City Building code which requires equal numbers for each sex. The PANYNJ Tenant Alteration Standards use the building occupancy analysis to determine total number of fixtures under the NYC code; adds the 25% female factor; and then describes the relative size of facilities as "minor, medium or major" depending on the location within the terminal. For capacity analyses, a similar approach has been taken based on design hour passengers as a surrogate for an occupancy analysis.

Restroom capacity has been divided between the main terminal locations (ticketing, bag claim and non-secure concession areas) and the concourses (including restrooms in sterile FIS areas):

The terminal demand is based on design hour deplaning O&D passengers and their visitors @ 2.0 SF per person.

The concourse restroom demand is based on the PANYNJ/NYC Code methodology of occupancy equal to 150% of aircraft capacity (expressed as EQA) plus the additional factor for female fixtures. Restroom area per fixture is based on an average derived from plans of new or recently renovated terminals. The combined planning factor is equivalent to 230 SF per EQA.

In addition to handicapped access toilets, sinks and urinals, it is recommended that companion care restrooms be provided. These unisex restrooms allow an elderly or disabled person to be accompanied into a restroom by another person who assists the disabled person. Although not very large (typically 70-100 SF), retrofitting these companion care facilities can be difficult. The above planning factors include allowances for companion care restrooms and related janitor closets.

I.3.3 Annual Capacity Estimates

As discussed in previous sections, airport terminal facilities are sized to accommodate the peak (Design) hour passenger volumes of a design day. Design Hours for a specific planning horizon are calculated from annual forecasts based on assumptions as to:

- The percentage of annual passengers occurring in the peak month;
- The number of days in the peak month; and
- The percentage of daily passengers which arrive or depart in the peak hour. This percentage is either:

  1) estimated based on assumed changes from the existing base year activity, or

  2) estimated from a future design day schedule to which peak hour load factors have been applied.

This approach is very much "top down". Annual passengers have been forecast for each planning horizon; design hours projected; and facilities needs calculated based on assumed levels of service. Comparing these to existing conditions results in a deficiency or surplus for each functional area.

However, most policy makers and the public focus on a simpler annual capacity estimate. It is easier to understand that a terminal has been planned for "10 million annual passengers" than for "1,500 peak hour enplanements".

This annual passenger capacity is relatively straight forward when describing the level of activity used to program a new or expanded terminal. However, it is not necessarily the absolute "capacity" of the terminal. A terminal planned for 10 million passengers doesn't grind to a halt if 11 million passengers use it, just as a properly designed terminal shouldn't shut down on the busiest days of the year which exceed the Design Hour levels of activity. During these "super peak" days, waiting times would exceed design objectives and areas become more crowded, but the terminal should still function at a lower level of service.

One of the goals of this Study is to estimate the capacities of each airport (which requires the capacities of each terminal and its proportion of the airport's activity). This can be more complicated and variable than starting with the Design Day planning assumptions and working toward facilities requirements.

Taking a simple example beginning with the planning assumptions:

- 2 million annual enplanements.
- 10% of annual enplanements in the peak month = 200,000 monthly enplanements.
- Peak month has 31 days = 6,450 design day enplanements.
- Based on schedules and actual activity, 15% of daily enplanements occur in the peak hour = 970 design hour enplaned passengers.

From this, facilities would built to provide the desired level of service for 970 design hour enplanements, and it can be said that the terminal was designed with a "capacity" of 2 million annual enplanements. However, if the airlines change their patterns of activity so as to either add flights outside of the peak, or conversely, concentrate activity by reducing flights or aircraft size outside the peaks, that same 970 design hour facility could accommodate more, or less, than 2 million enplanements.

For example, without changing the seasonal patterns (peak month as percentage of annual passengers), the "annual capacity" of this theoretical terminal could change as follows:

- If flights were added outside the peak so that the 970 peak hour enplanements represented only 12% of daily passengers this would equal 8,080 daily enplanements; 250,580 peak month enplanements; and 2.506 million annual enplanements. High gate utilization conditions (such as hubbing or some low cost carriers) can increase this annual capacity even further.

- Conversely, if airline activity was reduced during the non-peak hours, so that the 970 peak hour enplanements represented 18% of daily passengers this would equal 5,390 daily enplanements; 167,060 peak month enplanements; and 1.671 million annual enplanements.

Thus, unanticipated changes in airline scheduling can change the "capacity" of this terminal to a range of approximately 1.7 - 2.5 million enplanements.

Annual Capacity Approach

Due to the variability in the factors which can be used to translate design hour capacities to annual passengers, it is necessary to set these assumptions in a consistent manner for each passenger processing facility. In Section II.B, the 2015 design day schedules were analyzed and design hour load factor assumptions developed. For purposes of estimating a terminal's annual capacity, these 2015 assumptions are assumed to be fixed.

By fixing the assumptions underlying the design hour/annual passenger relationship, the annual capacity of individual facilities can be calculated by ratio. The basic approach is as follows:

- Using the recommended facilities demands for 2015, a ratio is established between design hour passengers and the facility. For example, 20 enplaned peak hour O&D passengers per equivalent check-in position with the processing time and utilization assumptions for 2015.

- This ratio is applied to the existing facilities to estimate the design hour capacity of each. For example, if the terminal has 60 equivalent check-in positions, this would be a capacity of 1,200 peak hour O&D passengers.

- This peak hour facility capacity is then compared to the design hour/annual passenger relationship. Using the previous example of 970 design hour enplanements for 2.0 million enplanements, the ratio is 2,062 annual enplanements per peak hour enplanement. Applying this to a check-in capacity of 1,200 peak hour enplanements yields an annual capacity estimate of 2.47 million O&D enplanements based on check-in facilities.

The consultant believes there are seven facilities which fundamentally determine terminal processing capacity:

- Check-in positions - both international and domestic
- Security screening (SSCP) lanes
- Contact gate mix
- Holdroom area

- Domestic bag claim frontage
- International arrivals primary inspection lanes
- International arrivals bag claim frontage

Discussions with PANYNJ staff have focused on the first four facilities - check-in, SSCP, gates and holdrooms - as the key capacity determinants. The three arrivals functions are secondary determinants primarily relating to level of service issues.

Other facilities, such as circulation and queuing areas, concessions or airline lounges can affect the level of passenger comfort/amenity or revenue generating potential, but are not critical to passenger processing. Airline operating areas, baggage handling and offices similarly affect the efficiency of airline operations but only indirectly the ability to handle passengers.

In the following tables these annual capacity estimates have been computed for each terminal. In most cases there is a range of annual capacities for each terminal based on the various facilities. The decision then is to take one of three approaches:

1. Use the full range of indicated capacities recognizing that few terminals have balanced facilities.

2. Take a worst case "point of failure" approach and base the annual capacity on the weakest link. This may involve all elements or be limited to those seen to be most critical and most difficult to improve.

3. Develop a weight for each element and compute a weighted average capacity.

Based on discussions with the PANYNJ staff, the full range of capacities has been retained for each terminal, but is limited to the four key facilities in estimating the annual capacity range of each airport.

Annual capacities have been estimated for combined domestic international annual enplanements using the four key determinants, and for both combined and international enplanements using the secondary determinants. These are presented for each airport in Sections II, III and IV.

I.4 On-Airport Roadway & Terminal Frontage Capacity

I.4.1 Introduction

On airport roadway and terminal frontage capacity and needs analysis was conducted for 2004 baseline and forecast 2015 and 2025 conditions. This process encompassed two components. First, vehicle demand was derived for each frontage and roadway segment analyzed. For frontage analyses, demand was translated into required frontage length and compared with existing available frontage. For on-airport roadway analysis, vehicle demand was analyzed with respect to segment capacity at various service levels for each segment analyzed. These processes are described below.

I.4.2 Demand Estimation

Baseline demand for on-airport roadways and terminal frontages in terms of total vehicles, and vehicles by class when required, was derived based upon a combination of field count data and 2004 design day airline schedules. Forecast demand for 2015 was derived based upon projected 2015 design day schedules, with demand incrementally applied to 2004 baseline demand for frontages and roadway segments. Forecast demand for 2025 was derived by projecting 2015 demand for frontages and roadway segments based upon domestic and international passenger forecasts developed by terminal as part of this study.

As a first step, baseline 2004 vehicle trip estimates were derived from air passenger volumes by applying various factors to the 2004 design hour-by-hour distribution of arriving and departing airline seats by terminal (differentiated into international and domestic operations). This began with the application of values for load factor and the proportion of arrivals and departures that are connecting rather than origin or destination passengers. Since passengers usually arrive at the airport well before their scheduled flight departure time, a distribution of passenger arrival time at the airport prior to departure was derived from the 2005 Departing Air Passenger Survey and applied, with the airport arrival spread compressed prior to 9AM for domestic departures as determined from the survey. It was assumed that arriving passengers leave the airport in the same hour as their flight arrival and that meeter/greeters arrive in the same hour as the arrival of their scheduled pickup. Various values for airport specific mode split, vehicle occupancy, and whether air passengers were dropped off, picked up or parked were also applied. Most were derived from the air passenger survey conducted as part of this study while load factors were consistent with those used in the terminal analysis and findings from other studies used to reconcile frontage use by vehicles with parking activity. Key values used are provided in Table I.4-1.

Table I.4-1
Variables Involved with Trip Generation Projections

LOAD FACTORS AND CONNECTING PASSENGERS

Variable	JFK International Airport									
	Terminal 1	Terminals 2-3		Terminal 4		Terminals 5/6	Terminal 7		Terminals 8/9	
	Int'l.	Dom.	Int'l.	Dom.	Int'l.	Dom.	Dom.	Int'l.	Dom.	Int'l.
Load Factor[1]	95%	85%	95%	75%	95%	95%	85%	90%	90%	90%
Connecting Passengers[2]	14%	29%	29%	11%	11%	11%	11%	11%	19%	19%

Variable	Newark Liberty International Airport						LaGuardia Airport			
	Terminal A		Terminal B		Terminal C		CTB	US Air	Delta/NW	Delta Shuttle
	Dom.	Int'l.	Dom.	Int'l.	Dom.	Int'l.	Dom.	Dom.	Dom.	Dom.
Load Factor	85%	85%	85%	85%	90%	90%	90%	85%	90%	90%
Connecting Passengers[2]	6%	6%	11%	11%	16%	40%	2%	6%	2%	0%

Source:
1. Terminal Capacity Analyses, Hirsh Associates, 3/16/06.
2. 2005 Port Authority of NY & NJ Departing Air Passenger Surveys.

MODAL SPLITS

Airport	Private Car			Taxi	Limo/Car Service (For Hire)	Shared Limo/ Courtesy Vehicles	Courtesy Vans	Scheduled Bus	Charter Bus	Local City Bus	Off-Airport Rail & AirTrain
	Dropped Off	*Parked On-Airport*	*Parked Off-Airport*								
JFK	36.1%	4.8%	1.1%	22.0%	15.0%	2.0%	0.0%	5.0%	2.0%	0.4%	12.0%
EWR	40.7%	9.9%	4.4%	9.0%	14.0%	2.0%	0.0%	4.0%	2.0%	1.0%	13.0%
LGA	27.0%	5.7%	2.3%	32.0%	17.0%	2.0%	5.0%	4.0%	1.0%	4.0%	0.0%

Source:
2005 Port Authority of NY & NJ Departing Air Passenger Surveys.

VEHICLE OCCUPANCIES

Airport	Private Car[1]			Taxi[1]	Limo/Car Service (For Hire)[1]	Shared Limo/ Courtesy Vehicles[2]	Courtesy Vans[2]	Scheduled Bus	Charter Bus[2]	Local City Bus	Off-Airport Rail & AirTrain
	Dropped Off	*Parked On-Airport*	*Parked Off-Airport*								
JFK	1.85	2.28	-	1.96	1.90	5	5	-	25	-	-
EWR	1.87	1.91	-	1.93	2.07	5	5	-	25	-	-
LGA	2.13	1.97	-	1.89	2.10	5	5	-	25	-	-

Notes:
1. Derived from 2005 Departing Air Passenger Surveys using travel party size.
2. Assumed based on American Airlines JFK Terminals 8/9 Redevelopment Project.

Baseline 2004 vehicle demand for specific on-airport roadway segments and terminal frontages by vehicle class was derived and compared with 2004 demand estimates and count data provided by the Port Authority. Peak hour counts were also conducted at a sample of high volume terminal frontages at each airport in May 2006. The baseline demand estimates were then adjusted (i.e., calibrated) as necessary for each frontage and roadway segment.

I.4.3 On-Airport Roadways

The on-airport roadway systems at John F. Kennedy International (JFK), Newark Liberty International (EWR) and LaGuardia (LGA) Airports serve various functions and vary significantly in overall layout and design. Rather than strictly define on-airport roadways as those under the jurisdiction of the Port Authority, on-airport roadways were defined in this study as roadway segments that service exclusively airport related traffic. The on-airport roadway analysis performed for this study focuses on primary roadway elements whose functions are to provide access to, egress from and circulation within the passenger terminal areas of each airport. Although vehicle trips not directly associated with air passenger departures and arrivals are present on these roadways, such as employee, police and service vehicle trips, the bulk of the traffic on most of the roadways analyzed is related to air passenger transportation. Secondary roadway elements, such as signalized intersections sometimes present at terminal frontages or at the junctions of ingress/egress roadways, are not included in this analysis in that they present a more localized condition at terminal frontages rather than an indication of overall on-airport roadway operations and whether the on-airport roadway system satisfies current and future needs.

The first step in the analysis of on-airport roadways was the identification of critical roadway segments, consisting of those roadway elements on which the highest levels of traffic per lane would be expected, and thus, the greatest potential for operational shortfall. Traffic operations and quality of flow are usually measured in terms of level of service (LOS), with LOS A representing the best condition with the lowest demand relative to capacity and LOS E operations at capacity (for uninterrupted flow conditions, i.e. those not controlled by traffic signals or STOP signs). Oversaturated conditions (LOS F) occur when demand exceeds capacity. Generally, LOS D is an acceptable design standard in urban areas, but due to the time-critical nature of airport related travel, the Port Authority has adopted LOS C as the service level threshold that indicates the need for planning of roadway improvements, given the time required to design and implement an improvement project.

Threshold values for LOS C through LOS E (the flow at the transition point to the next LOS, i.e. LOS C to LOS D) were derived for each critical segment. The derivation of these threshold values was based upon service volume information provided in the Highway Capacity Manual, considering the specific geometry of each segment, including the number of lanes, design speed, the effect of heavy vehicles and the presence of weaving movements. These threshold values, while approximate, are considered appropriate for planning purposes and are provided for each critical segment in the discussions of findings for the on-airport roadways of each airport.

I.4.4 Terminal Frontages

The amount of frontage curb required to accommodate the peak-hour arriving and departing flights on the terminal frontage roadways was estimated based upon a multi-server queuing model used by the Port Authority Engineering Department. This methodology was adopted from the FAA's *Apron and Terminal Building Manual* and a similar methodology used in the *1989 Frontage Operating Plan* prepared for the JFK Redevelopment Program. The curb space requirement at a specified limiting value of probability level is determined by the queuing model using input data in terms of peak-hour arrival and departure vehicles, derived using the various variables discussed in Section I.4.2, average dwell times and a range of probability confidence levels (i.e., 80% and 85%). An 80% probability confidence level was used in this analysis, which would assure that at least 80% of the arriving vehicles will immediately find a legal space at the curb.

Results of the frontage analysis algorithm are summarized for the terminal arrivals and departures roadways in terms of "common" and "segmented" frontage space in the discussions of findings for the terminal frontages of each airport. The common frontage allows a mix of different types of vehicles to access the entire curbside of a terminal facility. The segmented frontage assigns specific vehicle parking to a designated curbside location. Most of the arrivals frontage roadways provide segmented curb spaces whereas the departures frontage roadways provide common curb spaces. Results of the required terminal frontage analysis were compared to the available frontage supply for each airport to determine the extent of either surplus or deficit under 2004, 2015 and 2025 conditions. For those terminal frontages with two lane provision for loading and unloading passengers, the available frontage capacity was increased by 60% of the single curb lane capacity. For instance, double frontage lanes are currently provided along Terminals 4 and 6 at the JFK Airport and Terminal C at the EWR Airport.

It must be noted that, at locations wherein frontage deficits (or surpluses) are indicated, the amount of these deficits (or surpluses) are based on theoretical demand calculations. At many frontage curb locations, increasing the frontage lengths to satisfy the theoretical deficits is physically unattainable.

I.5 On-Airport Vehicle Parking

I.5.1 Introduction

On airport vehicle parking capacity and needs analysis was conducted for 2004 baseline and forecast 2015 and 2025 conditions. The capacities of the existing parking facilities of each airport were obtained from the Five Star parking inventory data compiled by Port Authority. The peak hour parking occupancy data at each parking facility was assumed to represent the 2004 baseline parking demand. For the purpose of this study, the most recent 2005/2006 update parking occupancy data was considered to be representative of the 2004 passenger baseline. Changes that were assumed for parking supply at each airport in the future, if any, were obtained from review of studies and discussions with the Port Authority. Future parking demand was estimated by applying the projected 2015 and 2025 growth rates to the 2004 baseline demand. Appropriate growth rates were developed based upon comparison of future daily origin and destination (O&D) passengers and existing 2004 O&D passengers.

I.5.2 Parking Demand Estimation

Both the daily inventory and peak parking demand data for each on-airport parking facility were compiled by the Port Authority at 3:00 PM during the months of August 2005 and March 2006. In general, the peak airport activity typically occurs in the month of August. However, actual peak parking occupancy data indicated that in several cases the March parking demand was greater than that of August. For the sake of a conservative analysis, the higher occupancy data from the 2005 and 2006 parking occupancy survey was used for each lot as the 2004 baseline parking condition. The available parking supply at each airport also reflects the effect of the parking restriction imposed within a 300-foot security distance from airfield area.

For the projection of future parking demand, the daily O&D passenger parameter was adopted from the methodology used in the “Parking Generation Manual” published by the Institute of Transportation Engineers (ITE). The daily O&D passenger estimate was derived from the projected 2015 and 2025 design day airline schedules. Future parking growth rates were estimated as a ratio of future design day O&D passengers over existing design day O&D passengers for the 2015 and 2025 forecast years.

I.6 Airport Access / Off-Airport Roadway Capacity

I.6.1 Introduction

Airport access is a key issue for the three commercial airports serving the New York metropolitan area, given the population density and recurring roadway congestion that is prevalent in the region. Airport access presents a complex spectrum of issues and factors and all three airports present a broad mix of highway and transit access options.

The quality of a trip to John F. Kennedy, LaGuardia or Newark Liberty Airport and the transportation options available can vary significantly depending upon where the trip originates from and the time of day/day of the week that the trip is made. Access by rail, available at JFK and EWR, provides the most reliable trip in terms of travel time. However, the practicality of this option in terms of a reasonable alternative to highway travel (auto, taxi, bus, limo, etc.) is highly dependent upon the trip origin. Also, while off-airport roadway travel in the vicinity of each airport can affect the total travel time to the airport and is often the most remembered aspect of the trip because of it's occurrence at the trip end when time is most critical, travel on this last segment encompasses only a minor segment of the total trip, which could often involve significant delays at other bottlenecks.

The approach used for off-airport access studies addresses both roadway and transit access characteristics, access capacities and usage to Kennedy, Newark and LaGuardia Airports. These studies include an evaluation of existing highway and transit systems as well as system expansions planned over the study time horizon. However, given the broad issues noted above, an analysis of specific off-airport access elements was limited to those that exclusively serve airport related trips, such as AirTrain at Newark and JFK and airport express bus. Although general conditions and future plans were considered, off-airport roadway operations, whether in the vicinity of the airport or in a regional context, present such a complex array of roadway system and non-airport related demand interactions that a detailed analysis was beyond the scope of this study.

I.6.2 Transit Access

Access to Kennedy, LaGuardia and Newark Airports is provided by public transportation. All three airports have local bus service as well as airport express bus service from Manhattan. Newark AirTrain is a monorail system that connects with the Newark Liberty International Airport Train station on the Northeast Corridor Line. It thus provides connecting service with Amtrak and NJTransit rail. It also serves as an intra-airport transportation system, providing connecting service between terminals, parking lots and rental car stations. AirTrain JFK, a light rail system, provides off-airport connecting service to the Howard Beach subway station and the Jamaica LIRR and subway station, as well as intra-airport service between terminals, long term parking lots and rental car stations.

More complete descriptions of off-airport transit services serving Kennedy, LaGuardia and Newark Airports are provided in Sections II, III and IV.

Varying types of usage data were available for Newark and JFK AirTrain systems. For Newark, August 2002 and August 2004 station on/off counts were available. These data were used, in conjunction with the 2004 design day air passenger arrivals/departures, inter-line connection and mode choice data, developed as described in Section I.4, to correlate base year surveyed AirTrain design day usage with usage derived from air passenger volumes. This correlation was then applied to 2015 and 2025 air passenger forecasts to develop projected AirTrain Newark usage for these planning horizon years.

Passenger on/off data was not available by station for AirTrain JFK. However, daily paid ridership was available for Howard Beach and Jamaica Stations, which provided a basis for checking the ridership estimates derived for AirTrain JFK from air passenger data as for Newark. With a satisfactory correlation, on/off and inter-station passenger load estimates were derived for the 2004 base year and 2015 and 2025 forecast years. Newark and JFK AirTrain segment passenger load estimates were then compared with capacities for 2004 base, 2015 and 2025 planning horizon years.

Although actual bus usage data was not available, air passenger arrivals and departures for the base year and forecasts for the 2015 and 2025 horizon years was used to derive estimated usage for base and future year airport express bus service. These estimates were compared with service capacity to identify possible service shortfalls.

I.6.3 Off-Airport Roadway Capacity

As noted above, off-airport roadway operations in the Region present a complex range of issues and operational problems. The cause of congested conditions, which is common during weekday AM and PM commuter peak periods as well as often on weekends, is often bottleneck interchanges, tunnels and bridges, but is also caused by the frequency of on/off ramps, weaving areas as well as general oversaturation. Therefore, it is impossible to properly evaluate off-airport roadway capacity by looking at isolated roadway segments and intersections, but rather, an area wide approach is necessary. While a detailed analysis is beyond the scope of this study, off-airport roadway conditions were evaluated on a qualitative basis with conditions, problems and issues were defined based upon available information and future projections made by the New York Metropolitan Transportation Council, the metropolitan planning organization for the downstate region. Also, all proposed improvements that would enhance airport access were identified and reviewed.

II. CAPACITY ASSESSMENT

John F. Kennedy International Airport

II.1 Airfield Capacity

The analysis of runway capacity for JFK was conducted as described in Section I, using the runway queue and delay model. The daily distribution of demand was derived from the forecast. CATER and ASPM databases were examined to determine runway capacity rates, runway configurations and existing (2004) delay levels. CATER data was also examined to determine the maximum lengths of runway queues. These lengths of queues were compared to the physical configuration of the taxiways themselves to determine whether the capacity of the taxiway system to manage departure runway queue delays. The model was calibrated against delay levels for 2004 in the FAA ASPM database. Future delay levels for future demand were derived using the model. Finally, capacity values required to have delays at existing levels were computed to define a level of future runway capacity need.

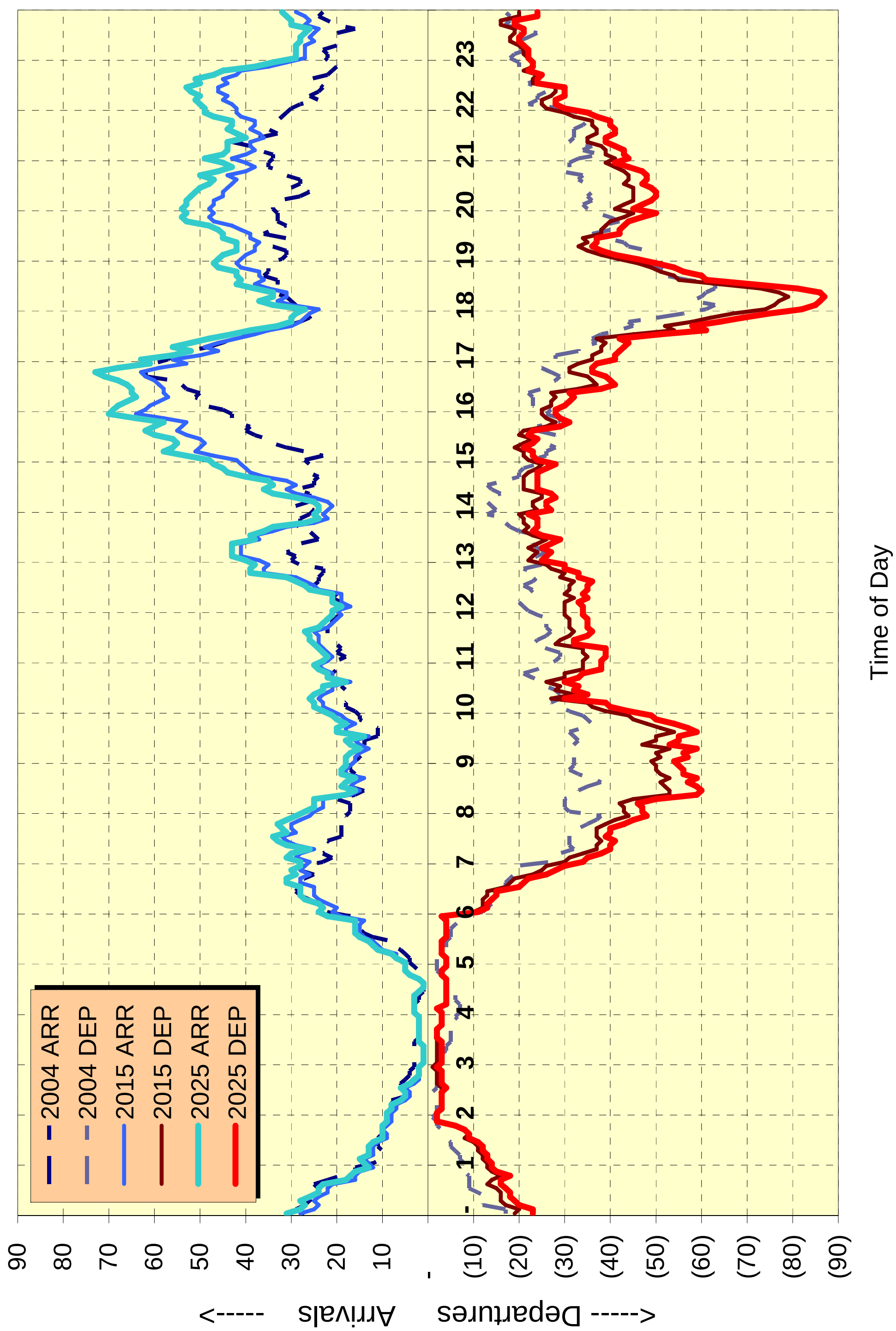
II.1.1 Future Demand Profiles

Exhibit II.1-1 shows the existing and forecast (2015 and 2025) hourly rate of demand (evaluated 60 minutes ahead every five minutes on a rolling basis). As shown, existing demand has 62 arrivals per hour and 63 departures per hour. This is expected to grow to 65 arrivals and 79 departures per hour by 2015, and to 73 arrivals and 87 departures by 2025.

As described in the forecast report, this growth is a combination of domestic growth, predominantly by jetBlue, and international growth by the two US based airlines, American and Delta. International growth also occurs with other airlines. The largest international market segment is Western Europe. The fastest growing international markets are Latin America, Asia and the Middle East.

This forecast creates a growth trend that features morning arrivals and departures, late evening arrivals, midday departures as well as the traditional peak hours of 3PM to 8PM. Peak arrival and peak departure hours are still at their traditional times. However, activity is more evenly spread out through the day.

Exhibit II.1-1
JFK - Forecast Rate Of Hourly Demand

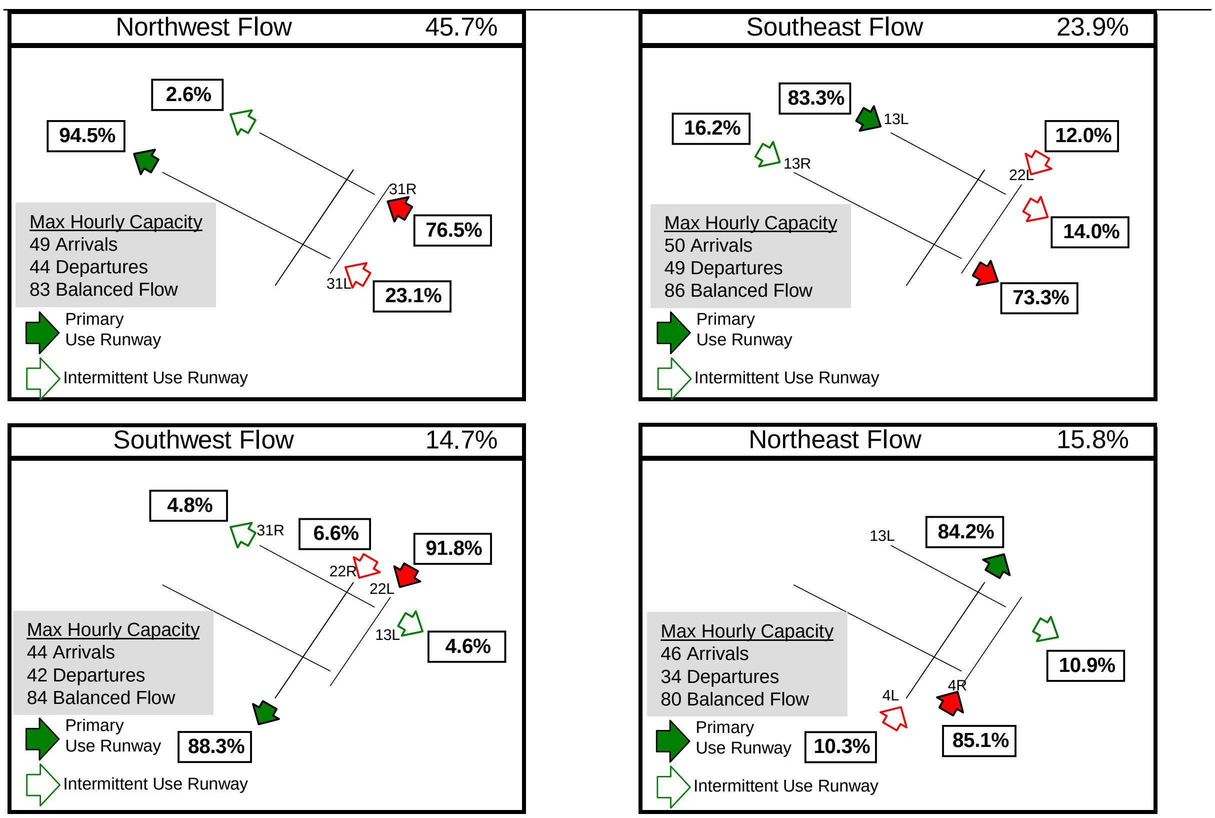


II.1.2 Existing Runway Configurations

Exhibit II.1-2 shows the most frequently used runway configurations used at JFK. Essentially, the operation of the primary arrival and primary departure runway establishes the airspace configuration and establishes the secondary arrival and departure runways that are used to handle peak hour flow conditions. The annual use of each configuration was established through an examination of CATER data for 2004.

Generally, the configuration analysis shows that a second arrival runway is used during peak conditions for Northwest, Southeast and Northeast flow conditions. Far less use of the second arrival runway occurs during Southwest flow conditions due to the proximity of LGA Airport. Southeast flow shows use of both parallel Runways 13L and 13R. This usage creates shorter taxi times but does not increase capacity since the same single approach airspace path is used to feed both runways. By contrast, the use of Runway 22L does provide additional capacity since it has an independent airspace.

Exhibit II.1-2
JFK Runway Configurations



The analysis of runway configuration data also shows that a second departure runway is used far less frequently than a second arrival runway. Only the southeast and southwest flow configurations have significant use of a second runway. In Northeast flow, the capacity gain through use of the second runway is very limited due to the runway intersection. Its use shortens taxi time for airlines on the North side of the terminal area.

Table II.1-1
JFK - Average Annual Capacity Rates

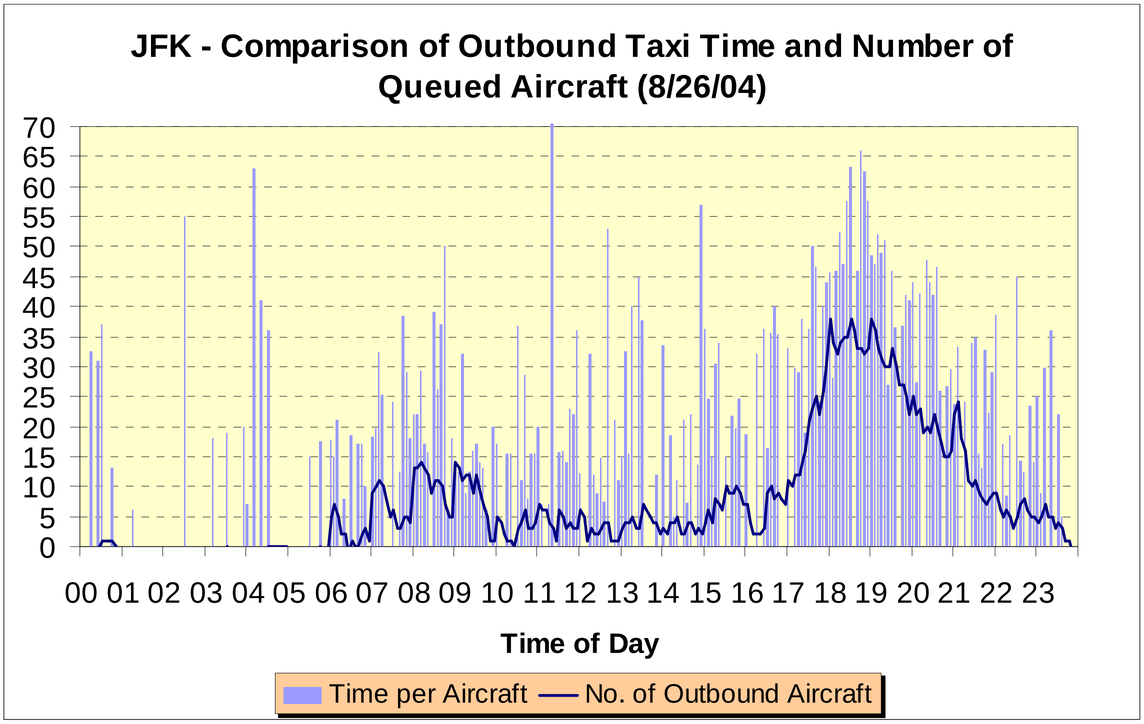
	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	34	36	47	36	34	44
5 Minute	2.8	3.0	3.9	3.0	2.8	3.7
20 Minute	11.3	12.0	15.7	12.0	11.3	14.7

The analysis of CATER and ASPM data determined the average annual runway capacity rates shown in **Table II-1**. The balanced capacity condition reflects use of single arrival and single departure runway. The rates shown reflect an annual average of weather conditions that include both Visual Flight Rules weather, when capacity rates are higher, and IFR weather conditions when capacity rates are lower, and the use of second runway for arrivals is more limited. The table shows capacity values expressed in three different time intervals. The hourly rate is provided since it is easiest to comprehend. The twenty minute rates are used by the queue model to plan the utilization of airfield capacity while the five minute rates are used for the actual delay calculations. The model operates in a five minute time-slice mode where capacity and delay calculations are updated every five minutes for a twenty-four hour day.

II.1.3 Existing Taxiway Capacity

Exhibit II.1-3 shows the taxi time for each aircraft (bars) and the number of aircraft taxiing between the gate and runway for a typical busy, good weather day in 2004. As shown, during the peak departure hours of 6PM to 8 PM, 35 aircraft are between the gates and runways with most aircraft having taxi times in excess of 45 minutes. Taxi times at JFK tend to be longer than at LGA or EWR since the distance from the gates to the departure runways is longer. JFK Airport has a large taxiway system that has the ability to handle this volume of taxiing aircraft.

Exhibit II.1-3
JFK - Typical Outbound Taxi Time Analysis



II.1.4 Existing and Future Delay Analyses

Table II-2, Exhibits II-4 and **II-5** show existing and forecast arrival delays for JFK. As shown, existing delay per aircraft levels will increase by a factor of five for arrivals and double for departures by 2015, with total aircraft activity only increasing by approximately 20 percent.

Table II.1-2
Summary Of Existing And Future JFK Aircraft Delays
(In Minutes)

	Arrival Delays			Departure Delays		
	2004	2015	2025	2004	2015	2025
Average	9.0	40.9	67.0	15.9	29.3	46.3
Peak Hour	30.3	116.9	191.8	56.6	87.1	128.5

Exhibit II.1-4
Existing And Future JFK Arrival Delays

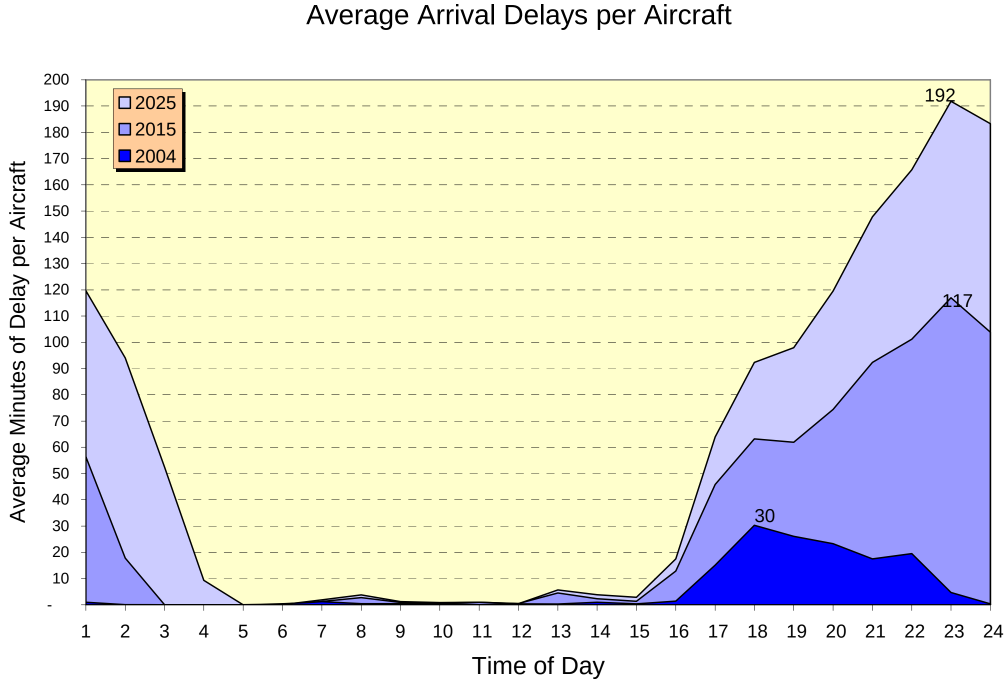
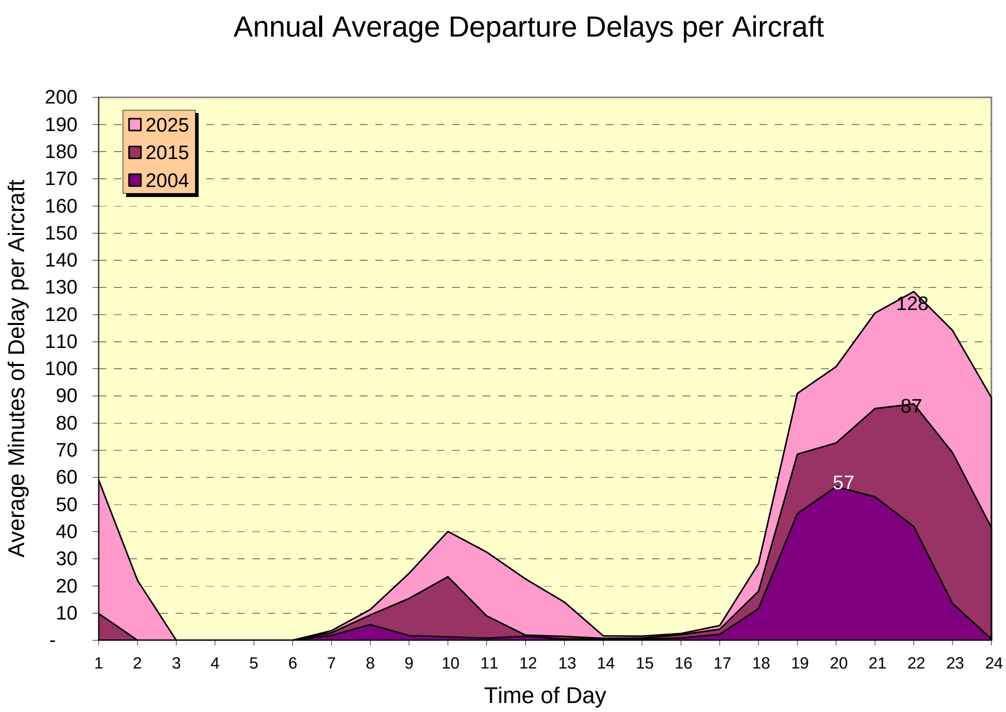


Exhibit II.1-5
Existing And Future JFK Departure Delays



Existing delay levels computed by the queue model compare favorably to those reported by the FAA ASPM database. The queue model reported 9.0 minutes of arrival delay while the FAA ASPM database recorded an average annual arrival delay of 10.5 minutes. The queue model reported 15.9 minutes of departure delay, which is the same value reported by the FAA ASPM database.

Most aircraft delays will occur in the afternoon and evening. By 2015 peak hour arrival delays will quadruple while peak hour departure delays will increase by 55 percent. Departure delays will increase more slowly than arrival delays since the arrival capacity constrains delays and meters the flow of aircraft to the departure runways. By 2025 the flow arrival aircraft would continue past 2AM and with peak hour delays exceeding three hours.

The morning departure peak will become an emerging delay issue with delays increasing from 4 to 21 to 40 minutes for 2004, 2015 and 2025 respectively. This morning departure peak is driven by domestic and Latin American departures.

More detailed reporting of aircraft delay modeling and queuing needs is presented in Appendix A.

II.1.5 Future Runway and Taxiway Capacity Needs

The queue model was run iteratively to establish the level of runway capacity required to achieve existing delay levels. **Table II-3** shows existing and forecast runway capacity needs for balanced and peak directional flow conditions. Key needs that define level of service are shown in green.

Table II.1-3
Existing and Forecast Runway Capacity Requirements

		2004	2015	2025
Balanced Flow (2004 & 2015 – One Arrival and One Departure Runway)				
	Arrivals	34	40	48
	Departures	36	40	48
	Total	70	80	96
Arrival Preference (Additional Flow Provided by 2nd Arrival Runway)				
	Arrivals	47	60	60
	Departures	36	40	48
	Total	83	100	108
Departure Preference (Additional Flow Provided by 2nd Departure Runway)				
	Arrivals	34	40	48
	Departures	44	60	60
	Total	78	100	108

Source: Landrum & Brown Analysis

Runway capacity levels for 2015 need to increase by approximately 15 to 20 percent from existing levels. To handle 2015 demand at existing delay levels, JFK needs to achieve 40 arrivals and 40 departures per hour from two runways during a balanced mode of operation. Peak one-way flows of 60 arrivals or 60 departures need to be achieved to handle peak hour conditions.

80 operations per hour (40 arrivals and 40 departures) is likely to be the maximum achievable capacity from the two parallel runways in a one for arrivals and one for departures operation. These rates today are achieved only during optimum conditions. Additional capacity to handle peak directional flows – an additional 20 arrivals or 20 departures per hour (for a total of 60 arrivals or 60 departures per hour) must come from use of a 2nd Runway for arrivals or departures. However, current airspace constraints caused primarily by the proximity of LGA limits the use of a 2nd runway during several configurations. Application of improved aircraft guidance technology that would allow shorter final approach segments to either airport may increase the ability of JFK to use a 2nd arrival or departure runway to accommodate peak flows more readily.

In the event that existing runway utilization rates cannot be increased, to 80 operations per hour, the taxiway system must accommodate a total departure runway queue of 35 to 50 aircraft with another 10 to 15 aircraft in the gate areas taxiing towards the runways. This is achievable in most, but not in all runway configurations.

By 2025, the runway capacity need is for 48 arrivals and 48 departures per hour, with peak single direction flows of 60 arrivals or 60 departures per hour. The airport needs two fully airspace independent parallel runways, plus a third runway to accommodate peak flow conditions to accommodate this level of activity. While these runways already exist at JFK, the ability to operate them independently without interference from LGA airspace does not yet exist. Additional research into air traffic control and aircraft guidance technology is required.

II.2 Gate Utilization

Please refer to Appendix B for gate charts depicting utilization for planning years 2004 & 2015

II.3 Terminal Capacity

This section contains a summary of the major findings of the terminal facilities assessment for JFK. The findings are presented separately for each terminal.

Each terminal's subsection contains exhibits of the 2015 Design Day scheduled seats, and a Terminal Capacity Analysis table. As discussed in Section I.3, the table shows existing and approved facilities; recommended facilities to support current and forecast levels of activity; and any surpluses or deficiencies.

The final subsection contains the annual passenger capacity estimates based on the key facilities identified in Section I.3.3.

In a number of terminals, achieving the full capacity of existing facilities will require: additional investment (not identified explicitly herein); changes in airline leases; and/or changes in operating procedures from exclusive to preferential or common use. (For example, in order to fully utilize the check-in counter capacity in EWR Terminal A, modifications to the outbound baggage systems may be required to allow more flexibility in use. In other terminals, such as the LGA CTB, changes from exclusive to preferential or common use for gates and baggage claim may be necessary to balance utilization across the terminal.) These potential solutions would need to be studied in further detail to determine the optimum approach for addressing each terminal's capacity constraints.

The terminal capacity analysis presented in the tables and exhibits in this section was developed by Hirsh Associates.

II.3.1 Notes on the Terminal Analyses

Terminal-Specific Factors

Many of the planning assumptions and factors used in Section I.3 are common to all of the terminals. Others vary by terminal based on passenger, airline, and/or building characteristics. In order to easily compare the key variable assumptions used for each terminal, Table II.3-1 summarizes these by terminal.

Concessions

Concessions utilization factors were developed for individual terminals or groups of terminals with similar passenger characteristics. These are presented in Tables II.3-2 through II.3-5. As discussed in Section I.3, these are initial estimates of concession demand potential, and do not factor in the wide range of revenue per square foot achieved by similar concessions in different terminals. Comparisons of secure vs. non-secure concessions do not include duty free shops which may be located in either secure or non-secure areas.

Remote Parking Positions

As noted in Section I.2 (Analysis of Gate Capacity), remote parking positions were estimated only for the 2015 Design Day schedule to provide a guide to over-all airport apron requirements. These are summarized in Table II.3-6.

Airline Space

All of the terminals are considered undersized in terms of offices in proximity to the ATO due to island configurations, terminal depth, or airline preference for locating administrative functions. When evaluating capacity, ATO offices and other office/operations space has been combined

Annual Capacity

Annual capacities have been estimated for combined domestic and international annual enplanements using the four key determinants, and for domestic or international enplanements using the secondary determinants. The key determinants are: check-in positions, SSCP lanes; contact gate frontage (NBEG); and holdrooms. Secondary determinants are domestic baggage claim frontage; international primary inspection positions; and international baggage claim frontage. These are summarized in Table II.3-13.

Table II.3-1
JFK – Terminal Specific Variables

	Terminals 1	2/3	4	5	6	7	8	
Domestic ATO Counters								
Conventional Staffed Positions	NA	30%	15%	25%	34%	35%	30%	of pass. use staffed counters
	NA	29%	32%	38%	38%	31%	35%	of pk hr pass. enter in peak 30 min.
	NA	1.0	2.0	1.0	1.0	1.2	1.2	airline exclusivity factor
Self-Service Kiosks	NA	40%	85%	45%	37%	50%	45%	of pass. use kiosks
Ticket Lobby Depth	NA	45	80	55	55	45	45	feet
International ATO Counters								
Conventional Staffed Positions	Y	N	Y	NA	NA	N	N	CUTE counters assumed?
	100%	80%	100%	NA	NA	80%	80%	of pass. use staffed counters
	NA	25%	NA	NA	NA	30%	28%	of pk hr pass. enter in peak 30 min.
	NA	1.3	NA	NA	NA	1.3	1.2	airline exclusivity factor
Self-Service Kiosks	NA	15%	NA	NA	NA	15%	15%	of pass. use kiosks
Ticket Lobby Depth	95	50	80	NA	NA	80	80	feet
Domestic Baggage Claim								
Claim Frontage Demand	0%	65%	65%	55%	55%	65%	65%	of pass. with checked bags
	0%	51%	50%	47%	60%	71%	50%	of pk hr pass. arrives in pk 20 min.
	2.2	2.2	1.6	2.0	2.0	1.6	1.9	avg. party size
Average Claim Unit Size	170	170	170	170	170	180	220	LF/unit
International Baggage Claim								
Claim Frontage Demand	90%	90%	90%	0%	0%	90%	90%	of pass. with checked bags
	52%	50%	45%	0%	0%	60%	56%	of pk hr pass. arrives in pk 20 min.
	2.0	2.1	1.8	NA	NA	2.2	2.0	avg. party size
	1.0	1.2	1.0	NA	NA	1.0	1.0	flight arrival concentration adjust factor
Average Claim Unit Size	220	200	220	NA	NA	200	280	LF/unit
Airline Space								
Airline Operations & Offices (excluding ATO)	1,600	2,400	2,080	4,300	4,300	2,100	2,800	SF/EQA
Make-up capacity (carts or LD3s)	3	3	3	4	4	3	3	/EQA
Baggage Make-up area	260	400	400	300	300	400	270	SF/cart
Checked Bags/pax for EDS screening	1.1	1.1	1.1	1.1	1.1	1.1	1.1	domestic
	1.5	1.5	1.5	1.5	1.5	1.5	1.5	int'l
Airline Clubs & 1st/Bus. Class Lounges	23,743	10,048	10,806	0	0	21,842	9,124	SF/million enpl (existing ratio)
Baggage Service Offices	2.0	2.0	2.0	1.2	1.2	1.5	1.5	SF/pk hr dep dom o&d+int'l total pass.
Concessions								
% located in secure area	60%	90%	60%	90%	90%	90%	90%	
Food/Beverage planning factor	6.1	6.5	6.0	5.4	5.4	6.5	6.5	SF/1,000 annual enplaned pax
News/Gift/Retail planning factor	5.1	5.2	4.8	4.4	4.4	5.2	5.2	SF/1,000 annual enplaned pax
Duty Free planning factor	3.2	2.7	3.1	0.0	0.0	2.7	2.7	SF/1,000 annual enplaned pax
Other services planning factor	1.0	0.7	2.0	0.7	0.7	0.5	0.7	SF/1,000 annual enplaned pax
Concession Support Area	30%	25%	30%	25%	25%	25%	25%	of concession space
Other Public Areas								
Public Seating and Meeter/Greeter Lobbies	5%	15%	20%	10%	10%	10%	10%	seating for __% of pass. & visitors

Table II.3-2
JFK – Estimate of Concession Utilization Factors: Terminal 1

Applied to annual enplanements in thousands

	Range 0.1 - 0.6 Food/Bev	Retail	
Passenger Characteristics			
Business/Pleasure	0.5	0.5	
Domestic/Int'l	0.6	0.6	
Originating airport, XXX/other	0.5	0.5	
Daily peaking, low/high	0.6	0.6	
Dwell times, short/long	0.5	0.5	
Facility Characteristics			
Scattered/clustered	0.5	0.5	
Difficult/easy access	0.5	0.5	
Location, away from gates/view of gates	0.4	0.4	
Landside/airside	0.3	0.5	
Term config, short walks/long walks	0.2	0.2	
Retail Characteristics (food/bev)			
Fast food/sit down	0.2		
Variety, not important/important	0.4		
Street pricing Policy, no/strict yes	0.4		
Non-branded/Nat'l,regional brands	0.5		
Retail Characteristics (news/gift/specialty)			
Traditional products/specialtys		0.5	
Non-branded/Nat'l,regional brands		0.5	
Street pricing Policy, no/strict yes		0.4	
Prominence as tourist attraction, low/high		0.6	
UF Factor (Retail factor discounted 25%)	**6.1**	**5.1**	SF/1,000 annual enplanements

	Range 0.1 - 0.6 Duty Free	
Passenger Characteristics		
Business/Pleasure	0.3	
Nationality, U.S. cits/Foreign visitng US	0.4	
European & Latin destinations/Asia Pacific	0.5	
Passenger dwell times, short/long	0.5	
Facility Characteristics		
Visibility & Access, poor/good	0.5	
Dutyfree, gate delivery/buy & take	0.1	
Retail Characteristics		
Merchandise mix, limited/diverse	0.5	
Merchandise cost savings, lower/significant	0.4	
UF Factor	**3.2**	SF/1,000 annual enplanements

Table II.3-3
JFK – Estimate of Concession Utilization Factors: Terminal 4

Applied to annual enplanements in thousands

	Range 0.1 - 0.6 Food/Bev	Retail	
Passenger Characteristics			
Business/Pleasure	0.5	0.5	
Domestic/Int'l	0.6	0.6	
Originating airport, XXX/other	0.5	0.5	
Daily peaking, low/high	0.6	0.6	
Dwell times, short/long	0.5	0.5	
Facility Characteristics			
Scattered/clustered	0.6	0.6	
Difficult/easy access	0.5	0.5	
Location, away from gates/view of gates	0.2	0.2	
Landside/airside	0.1	0.1	
Term config, short walks/long walks	0.3	0.3	
Retail Characteristics (food/bev)			
Fast food/sit down	0.2		
Variety, not important/important	0.5		
Street pricing Policy, no/strict yes	0.4		
Non-branded/Nat'l,regional brands	0.5		
Retail Characteristics (news/gift/specialty)			
Traditional products/specialtys		0.5	
Non-branded/Nat'l,regional brands		0.5	
Street pricing Policy, no/strict yes		0.4	
Prominence as tourist attraction, low/high		0.6	
UF Factor (Retail factor discounted 25%)	**6.0**	**4.8**	SF/1,000 annual enplanements

	Range 0.1 - 0.6 Duty Free	
Passenger Characteristics		
Business/Pleasure	0.3	
Nationality, U.S. cits/Foreign visitng US	0.4	
European & Latin destinations/Asia Pacific	0.3	
Passenger dwell times, short/long	0.6	
Facility Characteristics		
Visibility & Access, poor/good	0.6	
Dutyfree, gate delivery/buy & take	0.1	
Retail Characteristics		
Merchandise mix, limited/diverse	0.5	
Merchandise cost savings, lower/significant	0.3	
UF Factor	**3.1**	SF/1,000 annual enplanements

Table II.3-4
JFK – Estimate of Concession Utilization Factors: Terminal 2/3, 7 & 8

Applied to annual enplanements in thousands

	Range 0.1 - 0.6 Food/Bev	Retail	
Passenger Characteristics			
Business/Pleasure	0.5	0.5	
Domestic/Int'l	0.4	0.4	
Originating airport, XXX/other	0.4	0.4	
Daily peaking, low/high	0.6	0.6	
Dwell times, short/long	0.4	0.4	
Facility Characteristics			
Scattered/clustered	0.5	0.5	
Difficult/easy access	0.5	0.5	
Location, away from gates/view of gates	0.6	0.6	
Landside/airside	0.6	0.6	
Term config, short walks/long walks	0.4	0.4	
Retail Characteristics (food/bev)			
Fast food/sit down	0.2		
Variety, not important/important	0.5		
Street pricing Policy, no/strict yes	0.4		
Non-branded/Nat'l,regional brands	0.5		
Retail Characteristics (news/gift/specialty)			
Traditional products/specialtys		0.5	
Non-branded/Nat'l,regional brands		0.5	
Street pricing Policy, no/strict yes		0.4	
Prominence as tourist attraction, low/high		0.6	
UF Factor (Retail factor discounted 25%)	**6.5**	**5.2**	SF/1,000 annual enplanements

	Range 0.1 - 0.6 Duty Free	
Passenger Characteristics		
Business/Pleasure	0.5	
Nationality, U.S. cits/Foreign visitng US	0.2	
European & Latin destinations/Asia Pacific	0.2	
Passenger dwell times, short/long	0.5	
Facility Characteristics		
Visibility & Access, poor/good	0.5	
Dutyfree, gate delivery/buy & take	0.1	
Retail Characteristics		
Merchandise mix, limited/diverse	0.4	
Merchandise cost savings, lower/significant	0.3	
UF Factor	**2.7**	SF/1,000 annual enplanements

Table II.3-5
JFK – Estimate of Concession Utilization Factors: Terminal 5/6

Applied to annual enplanements in thousands

	Range 0.1 - 0.6		
	Food/Bev	**Retail**	
Passenger Characteristics			
Business/Pleasure	0.5	0.5	
Domestic/Int'l	0.1	0.1	
Originating airport, XXX/other	0.3	0.3	
Daily peaking, low/high	0.1	0.1	
Dwell times, short/long	0.3	0.3	
Facility Characteristics			
Scattered/clustered	0.5	0.5	
Difficult/easy access	0.5	0.5	
Location, away from gates/view of gates	0.6	0.6	
Landside/airside	0.6	0.6	
Term config, short walks/long walks	0.3	0.3	
Retail Characteristics (food/bev)			
Fast food/sit down	0.2		
Variety, not important/important	0.5		
Street pricing Policy, no/strict yes	0.4		
Non-branded/Nat'l,regional brands	0.5		
Retail Characteristics (news/gift/specialty)			
Traditional products/specialtys		0.5	
Non-branded/Nat'l,regional brands		0.5	
Street pricing Policy, no/strict yes		0.4	
Prominence as tourist attraction, low/high		0.6	
UF Factor (Retail factor discounted 25%)	**5.4**	**4.4**	SF/1,000 annual enplanements

Table II.3-6
JFK – 2015 Remote Parking Positions

	Terminal							Total	Existing
	T-1	T-3	T-4	T-5	T-6	T-7	T-8		[1]
Regional Aircraft (Group II)								0	18
Narrowbody (Group III)			1	27				28	
B757 (Group IIIa)		1	1			4	4	10	
Widebody (Group IV)	1	5					14	20	
B747/A340 (Group V)	2		10			1		13	16
A380 (Group VI)								0	
Total Positions	3	6	12	27	0	5	18	71	34 positions

[1] - Source: Port Authority Aircraft Gates Drawing Number JFK - 14233, 5/5/05

II.3.2 Terminal 1 Capacity

Gates

T-1's gates should be adequate through 2015. Four gates are being converted to accommodate the A380. In the maximum gate configuration, three A380 gates can be used simultaneously without closing an adjacent gate. In 2015 it is estimated that three hardstand positions would be required to allow active gate management.

Ticketing and Check-in

T-1 operates in a full CUTE mode, although the four ownership airlines have preference for counter use. The 96 check-in positions should be adequate through 2015.

The terminal has widely spaced island counters which are more than adequate for its activity.

Security Screening, Holdrooms and Circulation

T-1 has a shortage of SSCP lanes due to the location of major food/beverage concessions in the non-secure area of the terminal. The area per lane would also need to be increased by almost 40% to meet TSA standards.

The terminal has 32' wide secure corridors which are properly sized. Sterile corridors are 20' wide with moving walks.

Holdrooms are adequately sized for the mix of gates and have adequate capacity through 2015.

Domestic Baggage Claim

There are no domestic airlines currently or expected to operate at T-1.

Federal Inspection Services Facilities

The T-1 FIS has adequate primary inspection and baggage claim capacity through the forecast period.

Airline Space

T-1 has adequate office/operations capacity over-all through 2015 if available offices on the mezzanine are included.

There is adequate baggage make-up capacity through the end of the forecast period. EDS equipment is presently located off the ticket lobby and has less impact on passenger flow than in most terminals. An in-line system is being planned, but details were not finalized as of the date of this Study.

T-1 has lounges for each of the four major airlines (AF, JAL, KE, and LH). Most of the other tenant airlines use one of these lounges. Over the long term, it is anticipated that additional lounge space may be required due to tenant airlines requesting their own lounges, and expansion due to the passenger volumes of the A380.

The terminal has adequate baggage service office space through the forecast period.

Concessions

Only 26% of the major concessions space is secure as compared to a target of 60%. However, over-all concessions area appears adequate through the forecast period.

Other Public Areas

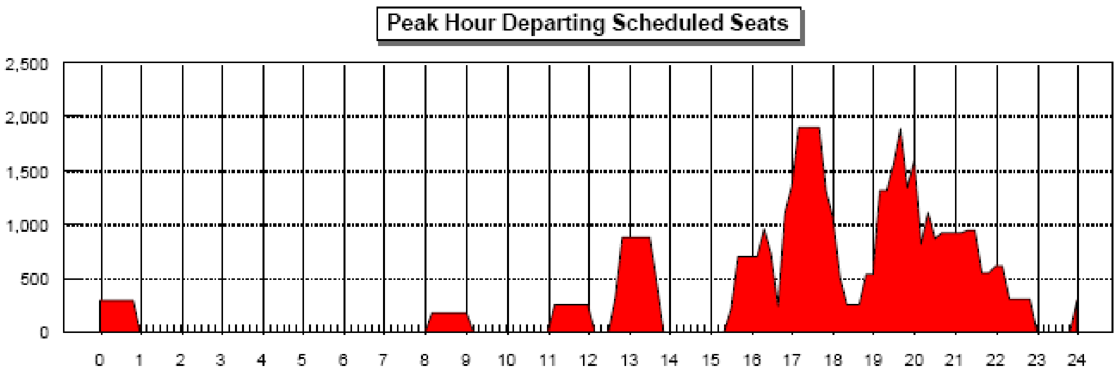
Public seating areas are adequate through the forecast period.

Non-secure restrooms are estimated to be adequate through 2015. Secure restrooms are undersized based on PANYNJ standards. However, these do not include restrooms within the FIS which serve arriving passengers. Thus, over-all T-1 is considered to have adequate secure restroom capacity for the forecast period.

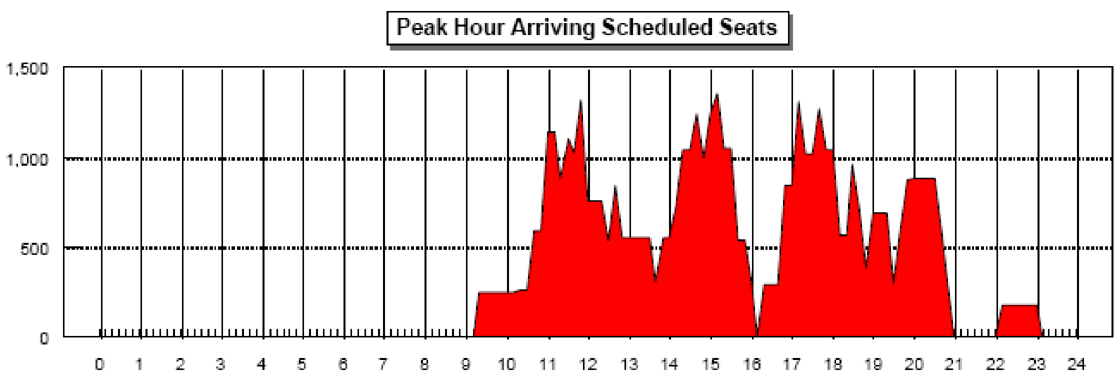
Annual Capacity

T-1 is relatively well balanced at approximately 2.0 million enplanements, except for the SSCP which limits activity to 1.5 million. The FIS has a greater capacity of 3.0 - 3.2 million enplanements.

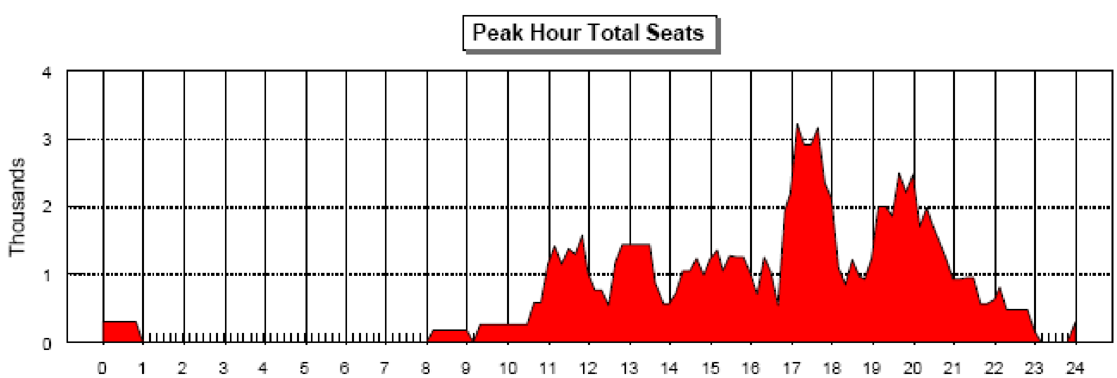
Exhibit II.3-1
JFK – Peak Hour Seats: Terminal 1
(2015 Design Day)



Peak Hour Seats: 1,909 begins at 1710 Daily Seats: 8,441
Peak Hour = 22.6% of daily seats



Peak Hour Seats: 1,358 begins at 1510 Daily Seats: 8,441
Peak Hour = 16.1% of daily seats



Peak Hour Seats: 3,223 begins at 1710 Daily Seats: 16,882
Peak Hour = 19.1% of daily seats

Table II.3-7
JFK –Terminal Capacity Analysis: Terminal 1

Terminal 1

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Recommended Facilities - Demand: Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Projected Surplus / (Deficiency): Forecast Year Activity 2010	2015	2020	2025
Annual Enplanements											
Domestic		0	0	0	0	0					
International		1,513,724	1,798,300	1,966,800	2,178,700	2,430,500					
Combined		1,513,724	1,798,300	1,966,800	2,178,700	2,430,500					
Design Hour Factors:											
Domestic Load Factor		0%	0%	0%	0%	0%					
Domestic Connect %		0%	0%	0%	0%	0%					
International Load Factor		95%	95%	95%	95%	95%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		0	0	0	0	0					
Enplaned Domestic total		0	0	0	0	0					
Deplaned Domestic O&D		0	0	0	0	0					
Deplaned Domestic total		0	0	0	0	0					
Enplaned International O&D		1,720	1,765	1,810	2,000	2,240					
Enplaned International total		1,720	1,765	1,810	2,000	2,240					
Deplaned International O&D		1,320	1,305	1,290	1,430	1,590					
Deplaned International total		1,320	1,305	1,290	1,430	1,590					
Meeter/Greeters per O&D Passenger		0.7	0.7	0.7	0.7	0.7					

Table II.3-7
JFK – Terminal Capacity Analysis: Terminal 1 (con't)

Terminal 1

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
GATES													
Total Gates (Domestic & International):													
Regional Aircraft (Group II)	0	gates						0	0	0	0	0	gates
Narrowbody (Group III)	0	gates						0	0	0	0	0	gates
B757 (Group IIIa)	0	gates						0	0	0	0	0	gates
Widebody (Group IV)	1	gates	1	2	2	1	1	0	(1)	(1)	0	0	gates
B747/A340 (Group V)	6	gates	9	6	6	8	9	(3)	0	0	(2)	(3)	gates
A380 (Group VI)	3	gates		2	2	2	2	3	1	1	1	1	gates
Total Gates	10	gates	10	10	10	11	12	0	0	0	(1)	(2)	gates
Narrowbody Equivalent Gates (NBEG)	19.8	NBEG	18.6	19.0	19.0	21.3	23.2	1.2	0.8	0.8	-1.5	-3.4	NBEG
Equivalent Aircraft (EQA)	30.1	EQA	27.1	28.2	28.2	31.9	34.7	3.0	1.9	1.9	-1.8	-4.6	EQA
International Arrivals Gates:													
Narrowbody (Group III)	0	gates						0	0	0	0	0	gates
B757 (Group IIIa)	0	gates						0	0	0	0	0	gates
Widebody (Group IV)	1	gates	1	1	1	1		0	0	0	0	1	gates
B747/A340 (Group V)	6	gates	4	3	3	3	5	2	3	3	3	1	gates
A380 (Group VI)	3	gates		1	1	1	1	3	2	2	2	2	gates
Total Gates	10	gates	5	5	5	5	6	5	5	5	5	4	gates
Narrowbody Equivalent Gates (NBEG)	19.8	NBEG	9.1	9.5	9.5	9.5	11.8	10.7	10.3	10.3	10.3	8.0	NBEG
Equivalent Aircraft (EQA)	30.1	EQA	13.1	14.1	14.1	14.1	17.8	17.0	16.0	16.0	16.0	12.3	EQA
TICKETING & CHECK-IN													
Ticket Counter - Domestic													
Conventional Staffed Positions	0	pos	0	0	0	0	0	0	0	0	0	0	pos
Self-Service Kiosks	0	units	0	0	0	0	0	0	0	0	0	0	units
Equivalent Positions	0	pos	0	0	0	0	0	0	0	0	0	0	pos
Linear Positions	0	pos	0	0	0	0	0	0	0	0	0	0	pos
Counter length	0	LF	0	0	0	0	0	0	0	0	0	0	LF
Ticket Lobby - depth	0	LF	na	na	na	na	na	0	0	0	0	0	LF
Ticket Lobby - area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Ticket Counter - International													
Conventional Staffed Positions	96	pos	86	91	96	106	119	10	5	0	(10)	(23)	pos
Self-Service Kiosks	0	units	0	0	0	0	0	0	0	0	0	0	units
Equivalent Positions	96	pos	86	91	96	106	119	10	5	0	(10)	(23)	pos
Linear Positions	96	pos	86	91	96	106	119	10	5	0	(10)	(23)	pos
Counter length	672	LF	600	640	670	740	830	72	32	2	(68)	(158)	LF
Ticket Lobby - depth or separation	95	LF	95	95	95	95	95	0	0	0	0	0	LF
Ticket Lobby - area	32,570	SF	30,000	32,000	33,500	37,000	41,500	2,570	570	(930)	(4,430)	(8,930)	SF
Ticket Counter - area	10,080	SF	8,400	9,000	9,400	10,400	11,600	1,680	1,080	680	(320)	(1,520)	SF
Subtotal	42,650	SF	38,400	41,000	42,900	47,400	53,100						SF

Table II.3-7
JFK – Terminal Capacity Analysis: Terminal 1 (con't)

Terminal 1

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	
HOLDROOMS & SECURE CIRCULATION													
Security Screening (SSCP) Lanes	7	lanes	9	9	9	10	12	(2)	(2)	(2)	(3)	(5)	lanes
Checkpoint/Search Area	6,630	SF	11,800	11,800	11,800	13,100	15,800	(5,170)	(5,170)	(5,170)	(6,470)	(9,170)	SF
Secure Circulation	46,740	SF	30,800	31,500	31,500	35,300	38,400	15,940	15,240	15,240	11,440	8,340	SF
Concourse Width	32	LF	30	30	30	30	30	2	2	2	2	2	LF
Sterile (Int'l Arrivals) Circulation	28,310	SF	8,000	8,400	8,400	8,400	10,400	20,310	19,910	19,910	19,910	17,910	SF
Holdrooms:													
Regional Aircraft (Groups II & III)		SF	0	0	0	0	0						SF
Narrowbody (Group III)		SF	0	0	0	0	0						SF
B757 (Group IIIa)		SF	0	0	0	0	0						SF
Widebody (Group IV)		SF	2,900	5,700	5,700	2,900	2,900						SF
B747/A340 (Group V)		SF	40,100	26,700	26,700	35,600	40,100						SF
A380 (Group VI)		SF	0	12,800	12,800	12,800	12,800						SF
Total Holdroom Area	45,870	SF	43,000	45,200	45,200	51,300	55,800	2,870	670	670	(5,430)	(9,930)	SF
Subtotal	127,550	SF	93,600	96,900	96,900	108,100	120,400						SF
DOMESTIC BAGGAGE CLAIM													
Claim Frontage Required	-	LF	0	0	0	0	0						LF
Claim Units	0	units	0	0	0	0	0	0	0	0	0	0	units
Claim Frontage Programmed	0	LF	0	0	0	0	0	0	0	0	0	0	LF
Baggage Claim Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
FEDERAL INSPECTION SERVICES													
Primary Inspection:								0	0	0	0	0	
Double Inspection Counters	17	dbl. counters	11	11	11	12	14	6	6	6	5	3	dbl. counters
Counter & Queue Area	19,900	SF	14,000	14,000	14,000	15,200	17,800	5,900	5,900	5,900	4,700	2,100	SF
Baggage Claim:													
Claim Frontage Required	-	LF	860	700	700	770	860						LF
Claim Units	5	units	4	3	3	4	4	1	2	2	1	1	units
Claim Frontage Programmed	1,090	LF	880	660	660	880	880	210	430	430	210	210	LF
Baggage Claim Area	42,350	SF	30,800	23,100	23,100	30,800	30,800	11,550	19,250	19,250	11,550	11,550	SF
Subtotal	62,250	SF	44,800	37,100	37,100	46,000	48,600						SF

Table II.3-7
JFK – Terminal Capacity Analysis: Terminal 1 (con't)

Terminal 1

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Recommended Facilities - Demand: Forecast Year Activity 2010	Recommended Facilities - Demand: Forecast Year Activity 2015	Recommended Facilities - Demand: Forecast Year Activity 2020	Recommended Facilities - Demand: Forecast Year Activity 2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Projected Surplus / (Deficiency): Forecast Year Activity 2010	Projected Surplus / (Deficiency): Forecast Year Activity 2015	Projected Surplus / (Deficiency): Forecast Year Activity 2020	Projected Surplus / (Deficiency): Forecast Year Activity 2025
AIRLINE SPACE											
ATO Offices	10,210 SF	18,000	19,200	20,100	22,200	24,900	(7,790)	(8,990)	(9,890)	(11,990)	(14,690) SF
Airline Operations & Offices (excluding ATO)	51,230 SF	43,400	45,100	45,100	51,000	55,500	7,830	6,130	6,130	230	(4,270) SF
Baggage Handling											
Estimated make-up capacity	104 carts/LD3s	81	85	85	96	104	23	19	19	8	(0) carts/LD3s
Baggage Make-up area	27,550 SF	21,100	22,000	22,000	24,900	27,100	6,450	5,550	5,550	2,650	450 SF
Checked Baggage Screening	0 SF	12,800	12,800	12,800	12,800	16,000	(12,800)	(12,800)	(12,800)	(12,800)	(16,000) SF
Baggage Claim Off-load	11,970 SF	10,000	7,500	7,500	10,000	10,000	1,970	4,470	4,470	1,970	1,970 SF
Airline Clubs & 1st/Bus. Class Lounges	35,940 SF	35,900	36,300	39,700	44,000	49,100	40	(360)	(3,760)	(8,060)	(13,160) SF
Baggage Service Offices	3,250 SF	2,600	2,600	2,600	2,900	3,200	650	650	650	350	50 SF
Subtotal	140,150 SF	143,800	145,500	149,800	167,800	185,800					SF
CONCESSIONS											
Ground Services/Information Counter	0 SF	200	200	200	200	200	(200)	(200)	(200)	(200)	(200) SF
Food/Beverage; Secure	2,860 SF	5,500	6,600	7,200	8,000	8,900	(2,640)	(3,740)	(4,340)	(5,140)	(6,040) SF
News/Gift/Retail; Secure	4,890 SF	4,600	5,500	6,000	6,700	7,400	290	(610)	(1,110)	(1,810)	(2,510) SF
Subtotal; Secure Concessions	7,750 SF	10,100	12,100	13,200	14,700	16,300	(2,350)	(4,350)	(5,450)	(6,950)	(8,550) SF
Food/Beverage; Non-Secure	19,130 SF	3,700	4,400	4,800	5,300	5,900	15,430	14,730	14,330	13,830	13,230 SF
News/Gift/Retail; Non-Secure	2,590 SF	3,100	3,700	4,000	4,400	5,000	(510)	(1,110)	(1,410)	(1,810)	(2,410) SF
Subtotal; Non-Secure Concessions	21,720 SF	6,800	8,100	8,800	9,700	10,900	14,920	13,620	12,920	12,020	10,820 SF
Duty Free	8,683 SF	4,800	5,800	6,300	7,000	7,800	3,883	2,883	2,383	1,683	883 SF
Other Services	1,793 SF	1,500	1,800	2,000	2,200	2,400	293	(7)	(207)	(407)	(607) SF
Concession Support Area	8,740 SF	7,000	8,300	9,100	10,100	11,200	1,740	440	(360)	(1,360)	(2,460) SF
Subtotal	48,686 SF	30,400	36,300	39,600	43,900	48,800					SF
OTHER PUBLIC AREAS											
Public Seating and Meeter/Greeter Lobbies	3,870 SF	1,700	1,700	1,600	1,800	2,000	2,170	2,170	2,270	2,070	1,870 SF
Restrooms - Terminal Locations	4,650 SF	4,500	4,400	4,400	4,900	5,400	150	250	250	(250)	(750) SF
Restrooms - Concourse Locations	6,080 SF	6,200	6,500	6,500	7,300	8,000	(120)	(420)	(420)	(1,220)	(1,920) SF
Subtotal	14,600 SF	12,400	12,600	12,500	14,000	15,400					SF
Vacant spaces suitable for: airline offices or lounges	5,050 SF										SF

[1] - Sources:
Terminal One Management, Inc. - leased areas drawings, May 2005
Hirsh Associates site visit, July 2005
Hirsh Associates Analysis

II.3.3 Terminals 2/3 Capacity

Gates

T-2/3 utilizes all of its gates under current conditions. The existing "shortage" is for hardstand RJ gates beyond the official PANYNJ count of five positions. This is made up operationally by using some excess Group V gate apron not required by the predominantly Group IV aircraft mix at T-3.

Through 2015, the terminal would require more RJ gates, which are assumed to then decrease over the long term. It is also forecast that some Group IV aircraft will be replaced by wider wingspan Group V aircraft. FIS gate demands are also forecast to increase through 2015. In 2015 it is estimated that six hardstand positions would be required to allow active gate management.

Ticketing and Check-in

T-2/3 has excess check-in counters through the forecast period.

Although the terminal complex appears to have excess lobby area this is due to the large number of check-in positions which are not used, especially in T-2. The lobbies are of various depths and mostly too shallow to adequately accommodate the peak hour passenger volumes.

Security Screening, Holdrooms and Circulation

T-2/3 has sufficient SSCP lanes in aggregate, however these are divided between two locations in T-2; three originating passenger locations in T-3; and two international arrivals re-screening locations in T-3. Thus, there can be inefficient utilization. The area per lane would also need to be increased by almost 30% to meet TSA standards.

Due to the location of SSCPs, secure circulation widths have been significantly reduced in most sections of T-2/3. In T-2, the effective circulation width is typically 12'. In T-3 it varies from as little as 6' clear width for the single loaded east side gates to 13' on the west side. Double loaded holdrooms have a 34' wide corridor in the southeast corner. Circulation is less well defined in the original section of T-3, but is generally adequate.

Sterile corridors are 15' wide and do not have moving walkways.

In aggregate, T-2/3 holdrooms have adequate capacity through 2015. However, holdroom capacity for specific gates varies significantly.

Domestic Baggage Claim

T-2/3 has adequate bag claim frontage in aggregate to meet forecast demands. However, the five units vary in size from 98' to 170' with an average of 132' which is considered undersized for the larger aircraft. Separation between claim units and walls is inadequate and passenger movement constricted.

Federal Inspection Services Facilities

The T-3 FIS has adequate primary inspection positions and baggage claim frontage capacity through the forecast period. However, the primary inspection queue depth is inadequate, and the configuration of the claim units leaves insufficient separations between adjacent units and between the units and walls.

Airline Space

T-2/3 has adequate office/operations capacity over-all through 2015. Beyond that point, there is vacant space on the mezzanine of T-2 which could meet demands though the forecast period.

There should be adequate baggage make-up capacity through the end of the forecast period. EDS equipment is presently located in the ticket lobbies and has more impact on passenger flow than in most terminals. An in-line system is not planned at this time. Domestic baggage claim off-load conveyors are mostly located on the apron outside the building footprint.

Delta has multiple membership club and international business class lounges in the two terminals. A small increase in area is anticipated as international traffic grows.

T-2/3 has adequate baggage service office space through the forecast period.

Concessions

Almost all of the concessions are located in the secure portions of the terminal. It is estimated that concessions are undersized for current activity. It should be noted that a large former concessions area in T-2 was closed off when the SSCPs were re-configured.

Other Public Areas

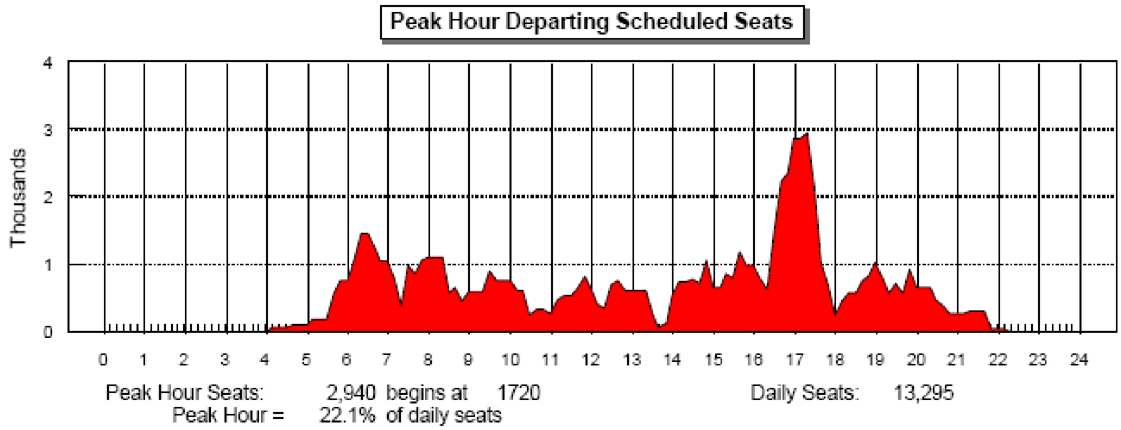
T-2/3 has insufficient seating area. Both terminals lack any designated waiting areas for domestic meeter/greeters

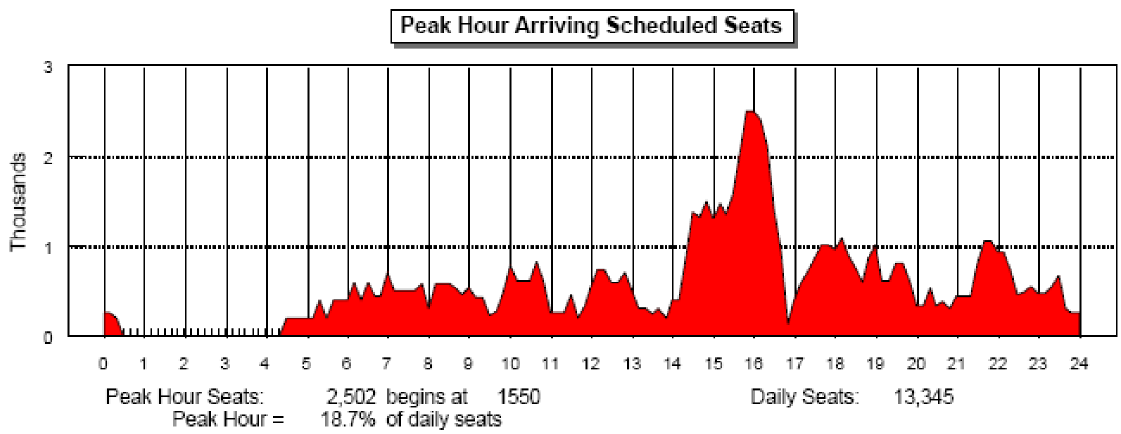
Non-secure restrooms are less than 40% of the area currently required, with no restrooms in the departures areas of either terminal. Secure restrooms, in aggregate, are adequate for existing activity, but most locations are individually undersized.

Annual Capacity

T-2/3 has a wide range of capacities with almost twice the check-in capacity as any other key facility. Based on the other key determinants, and the multiple SSCP locations, T-2/3 has an effective capacity of 4.1 - 4.6 million enplanements.

Exhibit II.3-2
JFK – Peak Hour Seats: Terminal 2 & 3 - Domestic
(2015 Design Day)





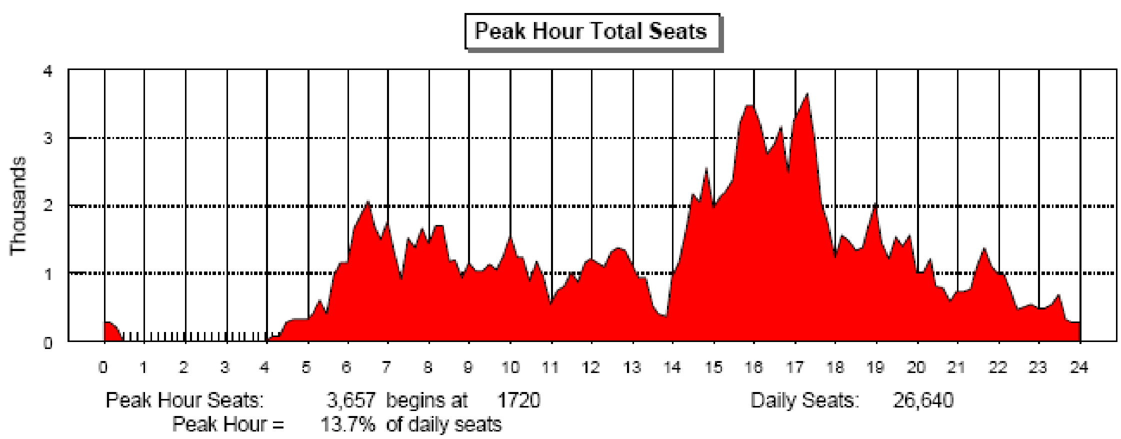
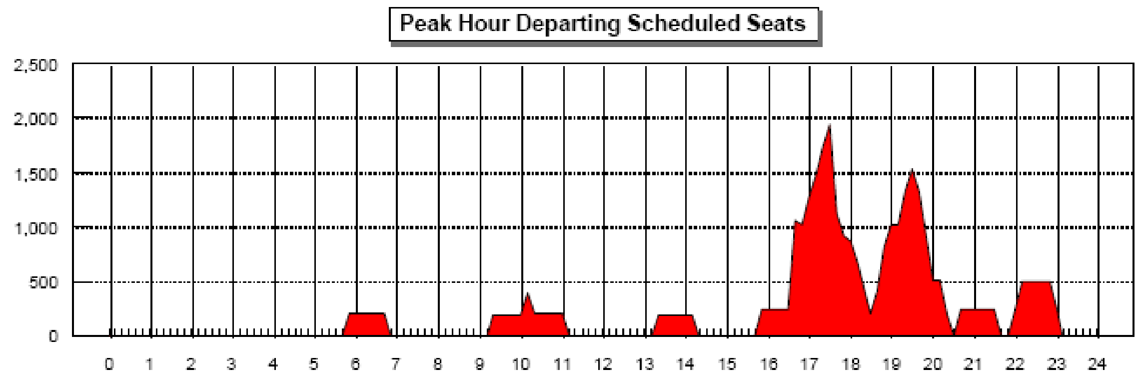
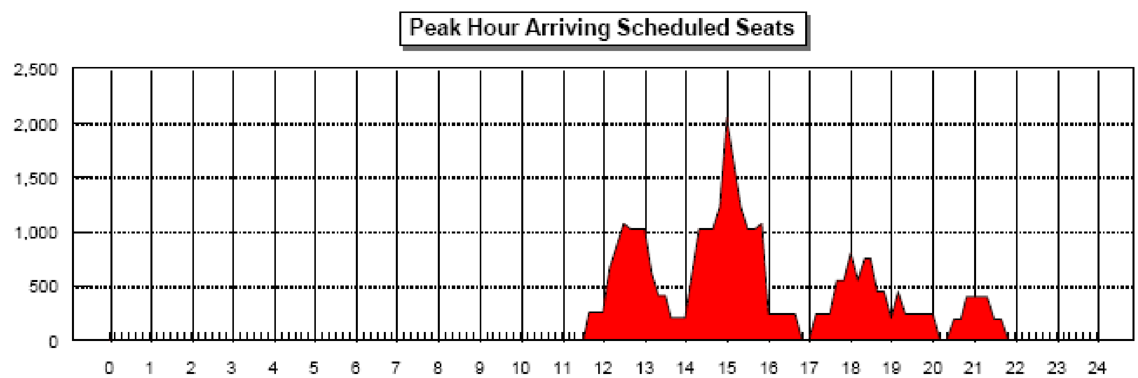


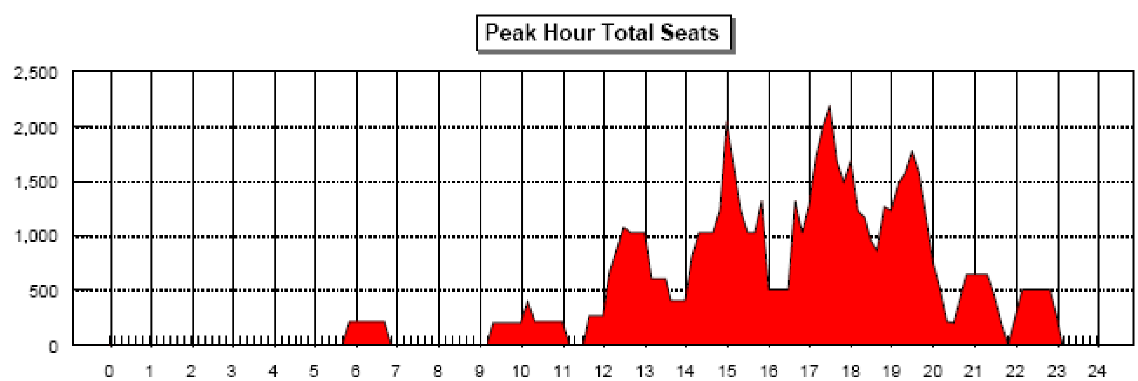
Exhibit II.3-3
JFK – Peak Hour Seats: Terminal 2 & 3 - International (2015 Design Day)



Peak Hour Seats: 1,948 begins at 1730 Daily Seats: 5,496
Peak Hour = 35.4% of daily seats



Peak Hour Seats: 2,045 begins at 1500 Daily Seats: 5,446
Peak Hour = 37.6% of daily seats



Peak Hour Seats: 2,198 begins at 1730 Daily Seats: 10,942
Peak Hour = 20.1% of daily seats

Table II.3-8
JFK – Terminal Capacity Analysis: Terminal 2 & 3

Terminals 2 & 3

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand					Projected Surplus / (Deficiency)				
		Base Year Activity	Forecast Year Activity				Base Year Activity	Forecast Year Activity			
		2004	2010	2015	2020	2025	2004	2010	2015	2020	2025
Annual Enplanements											
Domestic		2,329,812	3,090,900	3,177,700	3,271,300	3,373,000					
International		1,117,526	1,375,200	1,388,300	1,409,700	1,429,700					
Combined		3,447,337	4,466,100	4,566,000	4,681,000	4,802,700					
Design Hour Factors:											
Domestic Load Factor		85%	85%	85%	85%	85%					
Domestic Connect %		40%	40%	40%	40%	40%					
International Load Factor		95%	95%	95%	95%	95%					
International Connect %		40%	40%	40%	40%	40%					
Design Hour Passengers											
Enplaned Domestic O&D		1,220	1,360	1,500	1,540	1,590					
Enplaned Domestic total		2,030	2,270	2,500	2,570	2,650					
Deplaned Domestic O&D		1,370	1,330	1,280	1,320	1,360					
Deplaned Domestic total		2,280	2,210	2,130	2,190	2,260					
Enplaned International O&D		930	1,020	1,110	1,130	1,140					
Enplaned International total		1,540	1,700	1,850	1,880	1,910					
Deplaned International O&D		1,010	1,090	1,170	1,190	1,200					
Deplaned International total		1,680	1,810	1,940	1,970	2,000					
Meeter/Greeters per O&D Passenger		0.7	0.7	0.7	0.7	0.7					

Table II.3-8
JFK – Terminal Capacity Analysis: Terminal 2 & 3

Terminals 2 & 3

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	5 gates	8	12	15	14	13	(3)	(7)	(10)	(9)	(8) gates
Narrowbody (Group III)	4 gates	4	4	3	4	6	0	0	1	0	(2) gates
B757 (Group IIIa)	3 gates	6	7	9	9	8	(3)	(4)	(6)	(6)	(5) gates
Widebody (Group IV)	9 gates	14	13	13	12	11	(5)	(4)	(4)	(3)	(2) gates
B747/A340 (Group V)	10 gates	2	3	3	5	7	8	7	7	5	3 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	31 gates	34	39	43	44	45	(3)	(8)	(12)	(13)	(14) gates
Narrowbody Equivalent Gates (NBEG)	43.3 NBEG	41.0	45.3	48.6	51.2	53.7	2.3	-2.0	-5.3	-7.9	-10.4 NBEG
Equivalent Aircraft (EQA)	55.0 EQA	47.2	51.0	53.8	58.1	62.1	7.8	4.0	1.2	-3.1	-7.1 EQA
International Arrivals Gates:											
Narrowbody (Group III)	1 gates						1	1	1	1	1 gates
B757 (Group IIIa)	1 gates						1	1	1	1	1 gates
Widebody (Group IV)	3 gates	9	10	11	9	9	(6)	(7)	(8)	(6)	(6) gates
B747/A340 (Group V)	8 gates	2	3	3	5	5	6	5	5	3	3 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	13 gates	11	13	14	14	14	2	0	(1)	(1)	(1) gates
Narrowbody Equivalent Gates (NBEG)	21.8 NBEG	17.3	20.7	22.2	23.0	23.0	4.5	1.1	-0.4	-1.2	-1.2 NBEG
Equivalent Aircraft (EQA)	30.4 EQA	22.7	27.4	29.3	31.1	31.1	7.7	3.0	1.1	-0.7	-0.7 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	62 pos	13	12	13	13	13	49	50	49	49	49 pos
Self-Service Kiosks	29 units	16	16	18	18	19	13	13	11	11	10 units
Equivalent Positions	91 pos	29	28	31	31	32	62	63	60	60	59 pos
Linear Positions	76 pos	25	24	26	26	27	51	52	50	50	49 pos
Counter length	361 LF	130	120	130	130	140	231	241	231	231	221 LF
Ticket Lobby - depth	23-34 LF	45	45	45	45	45	(11-22)	(11-22)	(11-22)	(11-22)	(11-22) LF
Ticket Lobby - area	17,590 SF	6,500	6,000	6,500	6,500	7,000	11,090	11,590	11,090	11,090	10,590 SF
Ticket Counter - International											
Conventional Staffed Positions	84 pos	40	39	43	44	44	44	45	41	40	40 pos
Self-Service Kiosks	0 units	2	5	5	5	5	(2)	(5)	(5)	(5)	(5) units
Equivalent Positions	84 pos	42	44	48	49	49	42	40	36	35	35 pos
Linear Positions	84 pos	42	44	48	49	49	42	40	36	35	35 pos
Counter length	514 LF	250	260	290	290	290	264	254	224	224	224 LF
Ticket Lobby - depth	30-45 LF	50	50	50	50	50	(5-20)	(5-20)	(5-20)	(5-20)	(5-20) LF
Ticket Lobby - area	20,170 SF	13,800	14,300	16,000	16,000	16,000	6,370	5,870	4,170	4,170	4,170 SF
Ticket Counter - area	13,220 SF	4,800	4,800	5,400	5,400	5,500	8,420	8,420	7,820	7,820	7,720 SF
Subtotal	50,980 SF	25,100	25,100	27,900	27,900	28,500					SF

Table II.3-8
JFK – Terminal Capacity Analysis: Terminal 2 & 3

Terminals 2 & 3

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
HOLDROOMS & SECURE CIRCULATION											
Security Screening (SSCP) Lanes	18 lanes	12	13	15	15	15	6	5	3	3	3 lanes
Checkpoint/Search Area	18,400 SF	15,800	17,100	19,700	19,700	19,700	2,600	1,300	(1,300)	(1,300)	(1,300) SF
Secure Circulation	81,450 SF	90,500	100,000	107,300	113,000	118,600	(9,050)	(18,550)	(25,850)	(31,550)	(37,150) SF
Concourse Width	6-34' LF	20	20	20	20	20	(0-14')	(0-14')	(0-14')	(0-14')	(0-14') LF
Sterile (Int'l Arrivals) Circulation	35,550 SF	30,400	36,400	39,100	40,500	40,500	5,150	(850)	(3,550)	(4,950)	(4,950) SF
Holdrooms:											
Regional Aircraft (Groups II & III)	SF	6,400	9,600	12,000	11,200	10,400					SF
Narrowbody (Group III)	SF	7,400	7,400	5,600	7,400	11,100					SF
B757 (Group IIIa)	SF	14,400	16,800	21,600	21,600	19,200					SF
Widebody (Group IV)	SF	39,900	37,100	37,100	34,200	31,400					SF
B747/A340 (Group V)	SF	8,900	13,400	13,400	22,300	31,200					SF
A380 (Group VI)	SF	0	0	0	0	0					SF
Total Holdroom Area	90,490 SF	77,000	84,300	89,700	96,700	103,300	13,490	6,190	790	(6,210)	(12,810) SF
Subtotal	225,890 SF	213,700	237,800	255,800	269,900	282,100					SF
DOMESTIC BAGGAGE CLAIM											
Claim Frontage Required	- LF	460	490	470	480	500					LF
Claim Units	5 units	3	3	3	3	3	2	2	2	2	2 units
Claim Frontage Programmed	660 LF	510	510	510	510	510	150	150	150	150	150 LF
Baggage Claim Area	16,910 SF	15,300	15,300	15,300	15,300	15,300	1,610	1,610	1,610	1,610	1,610 SF
FEDERAL INSPECTION SERVICES											
Primary Inspection:							0	0	0	0	0
Double Inspection Counters	17 dbl. counters	14	16	17	17	17	3	1	0	0	0 dbl. counters
Counter & Queue Area	14,830 SF	17,800	20,300	21,600	21,600	21,600	(2,970)	(5,470)	(6,770)	(6,770)	(6,770) SF
Baggage Claim:											
Claim Frontage Required	- LF	920	1,100	1,180	1,200	1,220					LF
Claim Units	6 units	5	6	6	6	6	1	0	0	0	0 units
Claim Frontage Programmed	1,175 LF	1,000	1,200	1,200	1,200	1,200	175	(25)	(25)	(25)	(25) LF
Baggage Claim Area	36,600 SF	35,000	42,000	42,000	42,000	42,000	1,600	(5,400)	(5,400)	(5,400)	(5,400) SF
Subtotal	51,430 SF	52,800	62,300	63,600	63,600	63,600					SF

Table II.3-8
JFK – Terminal Capacity Analysis: Terminal 2 & 3

Terminals 2 & 3

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025
AIRLINE SPACE											
ATO Offices	7,110 SF	11,400	11,400	12,600	12,600	12,900	(4,290)	(4,290)	(5,490)	(5,490)	(5,790) SF
Airline Operations & Offices (excluding ATO)	140,030 SF	113,300	122,400	129,100	139,400	149,000	26,730	17,630	10,930	630	(8,970) SF
Baggage Handling											
Estimated make-up capacity	198 carts/LD3s	142	153	161	174	186	56	45	37	24	12 carts/LD3s
Baggage Make-up area	129,510 SF	56,600	61,200	64,600	69,700	74,500	72,910	68,310	64,910	59,810	55,010 SF
Checked Baggage Screening	9,100 SF	12,800	16,000	16,000	16,000	16,000	(3,700)	(6,900)	(6,900)	(6,900)	(6,900) SF
Baggage Claim Off-load	16,650 SF	20,000	22,500	22,500	22,500	22,500	(3,350)	(5,850)	(5,850)	(5,850)	(5,850) SF
Airline Clubs & 1st/Bus. Class Lounges	34,640 SF	34,600	35,900	36,700	37,600	38,600	40	(1,260)	(2,060)	(2,960)	(3,960) SF
Baggage Service Offices	6,770 SF	6,100	6,300	6,400	6,600	6,700	670	470	370	170	70 SF
Subtotal	343,810 SF	254,800	275,700	287,900	304,400	320,200					SF
CONCESSIONS											
Ground Services/Information Counter	140 SF	200	200	200	200	200	(60)	(60)	(60)	(60)	(60) SF
Food/Beverage; Secure	26,930 SF	20,200	26,100	26,700	27,400	28,100	6,730	830	230	(470)	(1,170) SF
News/Gift/Retail; Secure	9,740 SF	16,100	20,900	21,400	21,900	22,500	(6,360)	(11,160)	(11,660)	(12,160)	(12,760) SF
Subtotal; Secure Concessions	36,670 SF	36,300	47,000	48,100	49,300	50,600	370	(10,330)	(11,430)	(12,630)	(13,930) SF
Food/Beverage; Non-Secure	0 SF	2,200	2,900	3,000	3,000	3,100	(2,200)	(2,900)	(3,000)	(3,000)	(3,100) SF
News/Gift/Retail; Non-Secure	580 SF	1,800	2,300	2,400	2,400	2,500	(1,220)	(1,720)	(1,820)	(1,820)	(1,920) SF
Subtotal; Non-Secure Concessions	580 SF	4,000	5,200	5,400	5,400	5,600	(3,420)	(4,620)	(4,820)	(4,820)	(5,020) SF
Duty Free	6,130 SF	3,000	3,700	3,700	3,800	3,900	3,130	2,430	2,430	2,330	2,230 SF
Other Services	1,830 SF	2,400	3,100	3,200	3,300	3,400	(570)	(1,270)	(1,370)	(1,470)	(1,570) SF
Concession Support Area	16,010 SF	11,400	14,800	15,100	15,500	15,900	4,610	1,210	910	510	110 SF
Subtotal	61,360 SF	57,300	74,000	75,700	77,500	79,600					SF
OTHER PUBLIC AREAS											
Public Seating and Meeter/Greeter Lobbies	6,460 SF	9,100	9,300	9,400	9,600	9,800	(2,640)	(2,840)	(2,940)	(3,140)	(3,340) SF
Restrooms - Terminal Locations	3,130 SF	8,100	8,200	8,300	8,500	8,700	(4,970)	(5,070)	(5,170)	(5,370)	(5,570) SF
Restrooms - Concourse Locations	11,960 SF	10,900	11,700	12,400	13,400	14,300	1,060	260	(440)	(1,440)	(2,340) SF
Subtotal	21,550 SF	28,100	29,200	30,100	31,500	32,800					SF
Vacant spaces suitable for: airline offices or operations	19,680 SF										SF

[1] - Sources:
Corgan Associates Architects -
existing conditions plans, September 2004
Hirsh Associates site visit, July 2005
Hirsh Associates Analysis

II.3.4 Terminal 4 Capacity

Gates

T-4's contact gates should be adequate through 2020. Four gates can accommodate the A380. In the maximum gate configuration, three A380 gates can be used simultaneously without reducing the capacity of an adjacent gate. T-4 has a very high percentage of long ground time aircraft during the day. In 2015 it is estimated that 12 hardstand positions would be required to continue active gate management.

Ticketing and Check-in

T-4 operates in a full CUTE mode, with most airlines having regular locations. In addition to the 144 CUTE staffed positions, NW and Aer Lingus (EI) have installed kiosks in the ticket queue. The NW kiosks are primarily used by domestic passengers. Four common use self service (CUSS) kiosks were installed in mid-2006 for other international carriers, but only one airline is using them initially and terminal management expects slow adoption by others. For planning purposes it has been assumed that all international passengers will use a staffed CUTE counter. Check-in positions should be adequate through 2020.

The spacing of the T-4 island counters is adequate for its activity.

Security Screening, Holdrooms and Circulation

T-4 should have sufficient SSCP lanes through 2010. The location of almost all concessions prior to security can result in a surging of demand closer to boarding time which increases the number of SSCP lanes. The existing SSCP lanes have large queuing areas exceeding the planning area per lane.

The 36' wide concourse corridors are narrower than typically recommended for moving walks. However, due to the primarily single direction passenger flow of international departures, the corridor width is considered adequate.

Sterile corridors are 20' wide with provisions for future moving walkways.

Holdrooms are adequately sized for the mix of gates and has adequate capacity through 2020.

Domestic Baggage Claim

T-4's baggage claim area allows swing use between domestic and international. The claim unit typically assigned to domestic use has significant excess capacity throughout the forecast period.

Federal Inspection Services Facilities

The FIS has adequate primary inspection and baggage claim capacity through the forecast period.

Airline Space

T-4 has adequate office/operations capacity over-all through 2010. Additional space on the third level of the concourses can be built out in the future. Because of the number of ground handlers, the amount of operations space per EQA is anticipated to decline in the future.

The terminal has excess baggage make-up capacity through the end of the forecast period. EDS equipment is presently located in the ticket lobby. An in-line screening system was planned during the original design prior to 9/11, and a large screening area provided within the baggage sortation system. The types of screening equipment planned did not meet subsequent TSA requirements and no changes to the current EDS systems are planned at this time.

T-4 has five 1st/business class lounges, two of which are used by a single airline, and three are joint use. All are located in the non-secure portion of the terminal. It is anticipated that additional lounge space may be required in the future.

The terminal should have adequate baggage service office space through 2015.

Concessions

Only 4% of the major concessions space is secure as compared to a target of 60%. However, over-all concessions area appears adequate through the forecast period. Duty free concessions may become undersized in the later years of the forecast depending on the types of air service.

Other Public Areas

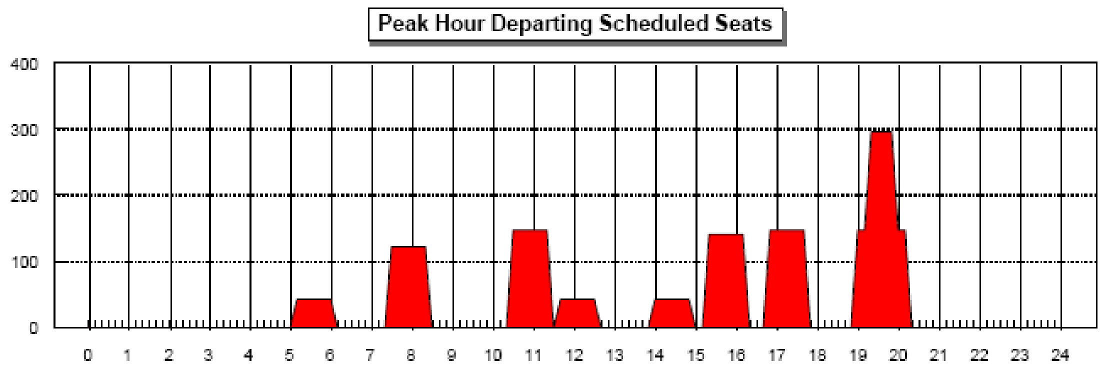
T-4 has a significant amount of excess capacity for both departures and arrivals waiting.

Non-secure restrooms are estimated to be adequate through 2015. Secure restrooms are undersized based on PANYNJ standards. However, these do not include restrooms within the FIS which serve arriving passengers. Thus, over-all T-4 is considered to have adequate secure restroom capacity through 2015.

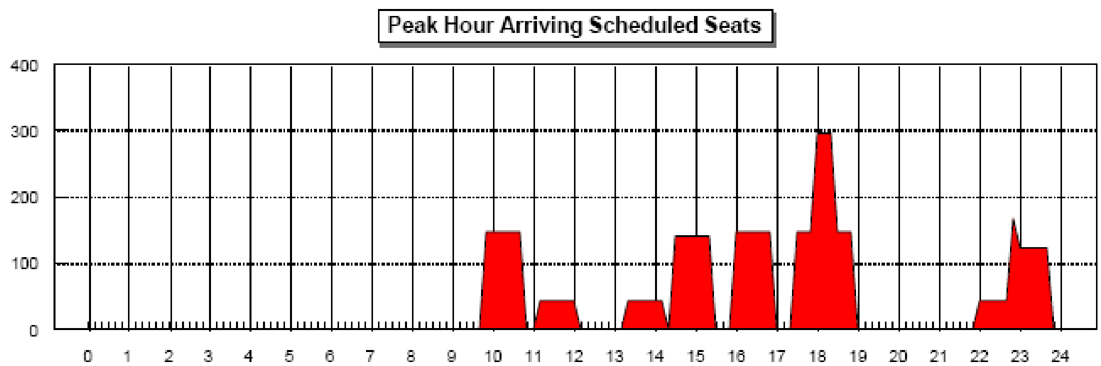
Annual Capacity

T-4 is relatively well balanced at 4.7 - 4.9 million enplanements, except for the SSCP which limits activity to 3.7 million. The FIS has a greater capacity of 5.5 million enplanements.

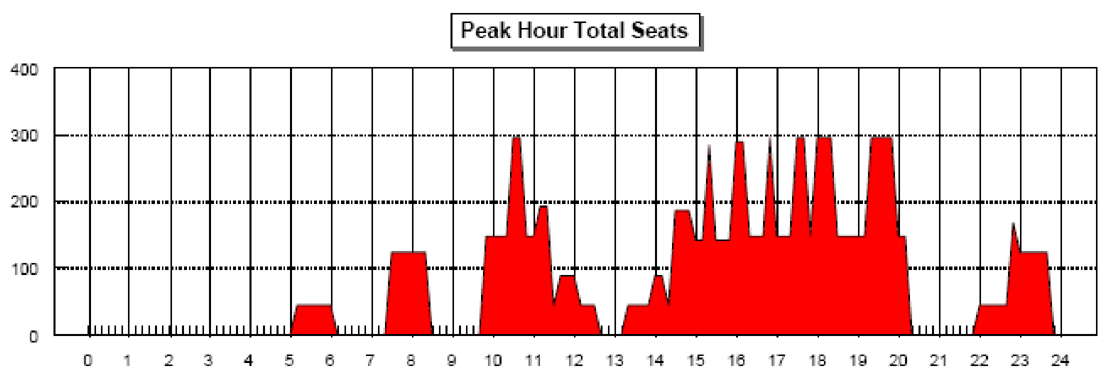
Exhibit II.3-4
JFK – Peak Hour Seats: Terminal 4 (Domestic)
(2015 Design Day)



Peak Hour Seats: 296 begins at 1920 Daily Seats: 990
Peak Hour = 29.9% of daily seats

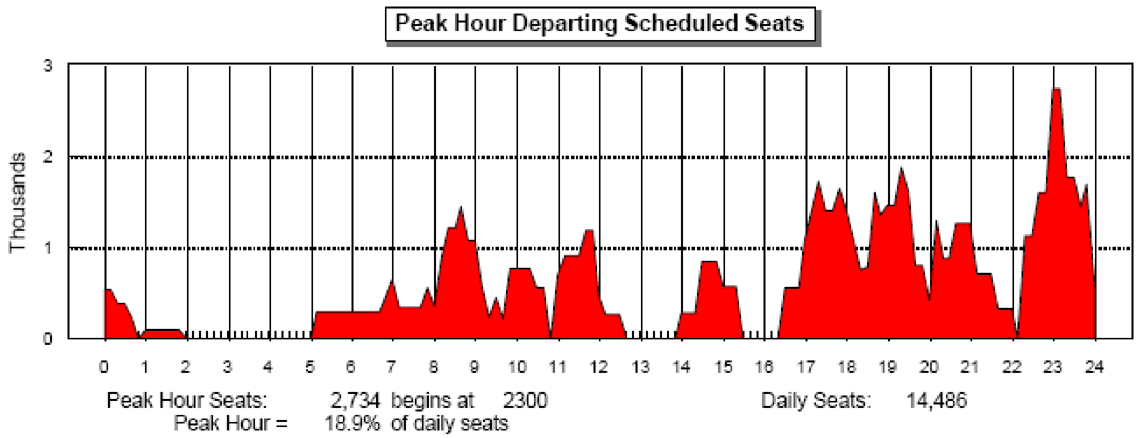


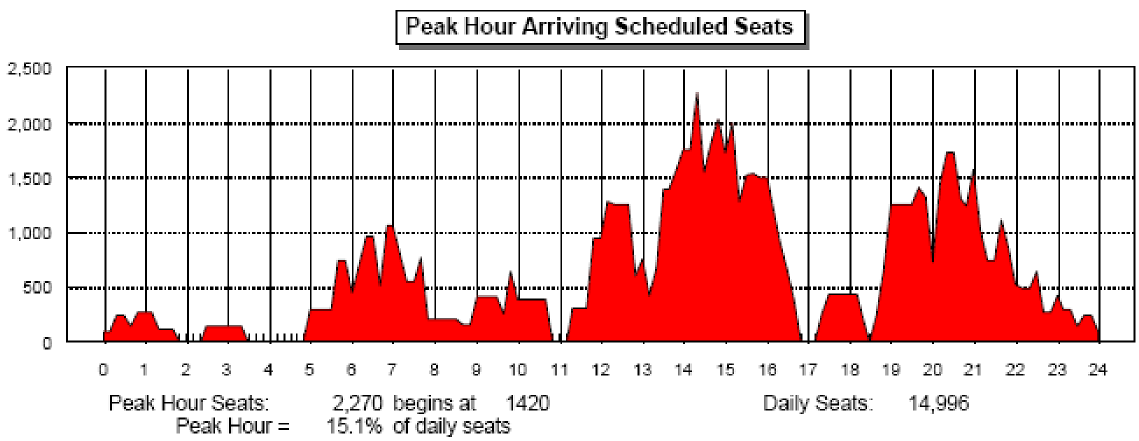
Peak Hour Seats: 296 begins at 1800 Daily Seats: 990
Peak Hour = 29.9% of daily seats



Peak Hour Seats: 296 begins at 1950 Daily Seats: 1,980
Peak Hour = 14.9% of daily seats

Exhibit II.3-5
JFK – Peak Hour Seats: Terminal 4 (International)
(2015 Design Day)





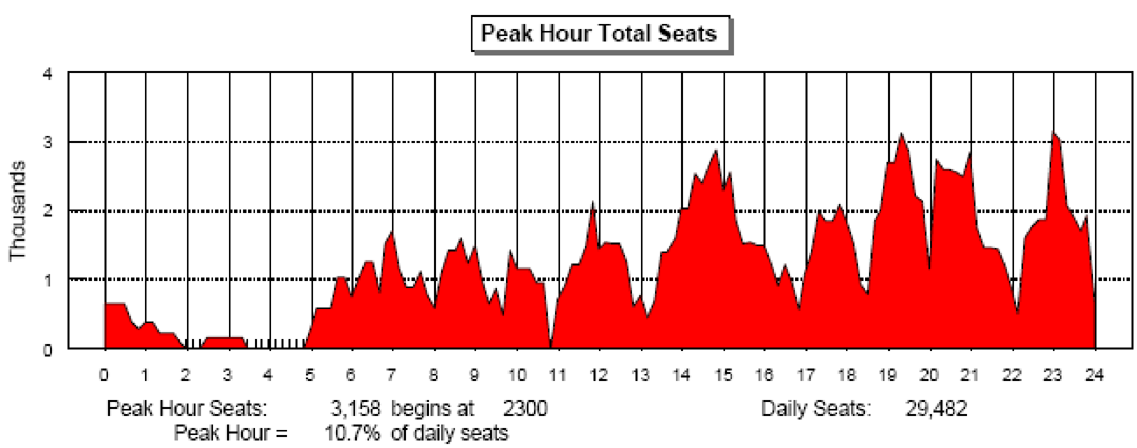


Table II.3-9
JFK – Terminal Capacity Analysis: Terminal 4

Terminal 4

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand					Projected Surplus / (Deficiency)				
		Base Year Activity	Forecast Year Activity				Base Year Activity	Forecast Year Activity			
		2004	2010	2015	2020	2025	2004	2010	2015	2020	2025
Annual Enplanements											
Domestic		248,335	183,300	187,900	192,900	198,325					
International		2,821,294	3,437,900	3,817,900	4,293,200	4,861,100					
Combined		3,069,629	3,621,200	4,005,800	4,486,100	5,059,425					
Design Hour Factors:											
Domestic Load Factor		75%	80%	80%	80%	80%					
Domestic Connect %		0%	0%	0%	0%	0%					
International Load Factor		95%	95%	95%	95%	95%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		130	190	240	250	250					
Enplaned Domestic total		130	190	240	250	250					
Deplaned Domestic O&D		210	230	240	250	250					
Deplaned Domestic total		210	230	240	250	250					
Enplaned International O&D		2,010	2,310	2,600	2,920	3,310					
Enplaned International total		2,010	2,310	2,600	2,920	3,310					
Deplaned International O&D		2,100	2,130	2,160	2,430	2,750					
Deplaned International total		2,100	2,130	2,160	2,430	2,750					
Meeter/Greeters per O&D Passenger		1.1	1.1	1.1	1.1	1.1					

Table II.3-9
JFK –Terminal Capacity Analysis: Terminal 4

Terminal 4

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	0 gates	1					(1)	0	0	0	0 gates
Narrowbody (Group III)	0 gates	1	1	2	2	2	(1)	(1)	(2)	(2)	(2) gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	1 gates	4	4	1	1	1	(3)	(3)	0	0	0 gates
B747/A340 (Group V)	12 gates	9	9	10	10	11	3	3	2	2	1 gates
A380 (Group VI)	3 gates		1	1	2	3	3	2	2	1	0 gates
Total Gates	16 gates	15	15	14	15	17	1	1	2	1	(1) gates
Narrowbody Equivalent Gates (NBEG)	31.2 NBEG	24.8	26.4	24.8	27.1	31.3	6.4	4.8	6.4	4.1	-0.1 NBEG
Equivalent Aircraft (EQA)	46.9 EQA	34.2	37.6	35.7	39.5	46.1	12.7	9.3	11.2	7.4	0.8 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	1 gates	4	3	1	1	1	(3)	(2)	0	0	0 gates
B747/A340 (Group V)	12 gates	9	9	10	10	11	3	3	2	2	1 gates
A380 (Group VI)	3 gates		1	1	2	3	3	2	2	1	0 gates
Total Gates	16 gates	13	13	12	13	15	3	3	4	3	1 gates
Narrowbody Equivalent Gates (NBEG)	31.2 NBEG	23.1	23.9	22.8	25.1	29.3	8.1	7.3	8.4	6.1	1.9 NBEG
Equivalent Aircraft (EQA)	46.9 EQA	32.8	34.7	33.7	37.5	44.1	14.1	12.2	13.2	9.4	2.8 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	4 pos	2	2	3	3	3	2	2	1	1	1 pos
Self-Service Kiosks	8 units	5	6	7	7	7	3	2	1	1	1 units
Equivalent Positions	12 pos	7	8	10	10	10	5	4	2	2	2 pos
Linear Positions	4 pos	3	3	4	4	4	1	1	0	0	0 pos
Counter length	25 LF	20	20	20	20	20	5	5	5	5	5 LF
Ticket Lobby - depth	80 LF	80	80	80	80	80	0	0	0	0	0 LF
Ticket Lobby - area	incl int'l SF	1,700	1,700	1,700	1,700	1,700	(1,700)	(1,700)	(1,700)	(1,700)	(1,700) SF
Ticket Counter - International											
Conventional Staffed Positions	140 pos	111	115	118	133	150	29	26	22	7	(10) pos
Self-Service Kiosks	6 units	0	0	0	0	0	6	6	6	6	6 units
Equivalent Positions	146 pos	111	115	118	133	150	35	32	28	13	(4) pos
Linear Positions	140 pos	107	110	114	128	144	33	30	26	12	(4) pos
Counter length	887 LF	700	720	740	830	940	187	167	147	57	(53) LF
Ticket Lobby - depth or separation	80 LF	80	80	80	80	80	0	0	0	0	0 LF
Ticket Lobby - area	49,700 SF	29,800	30,600	31,500	35,300	40,000	19,900	19,100	18,200	14,400	9,700 SF
Ticket Counter - area	14,360 SF	10,000	10,300	10,600	11,800	13,400	4,360	4,060	3,760	2,560	960 SF
Subtotal	64,060 SF	41,500	42,600	43,800	48,800	55,100					SF

Table II.3-9
JFK – Terminal Capacity Analysis: Terminal 4

Terminal 4

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	
HOLDROOMS & SECURE CIRCULATION													
Security Screening (SSCP) Lanes	13	lanes	10	12	14	15	17	3	1	(1)	(2)	(4)	lanes
Checkpoint/Search Area	25,980	SF	13,100	15,800	18,400	19,700	22,300	12,880	10,180	7,580	6,280	3,680	SF
Secure Circulation	71,320	SF	49,300	52,500	49,300	53,900	62,200	22,020	18,820	22,020	17,420	9,120	SF
Concourse Width	36	LF	36	36	36	36	36	0	0	0	0	0	LF
Sterile (Int'l Arrivals) Circulation	47,670	SF	27,100	28,000	26,700	29,400	34,400	20,570	19,670	20,970	18,270	13,270	SF
Holdrooms:													
Regional Aircraft (Groups II & III)		SF	800	0	0	0	0						SF
Narrowbody (Group III)		SF	1,900	1,900	3,700	3,700	3,700						SF
B757 (Group IIIa)		SF	0	0	0	0	0						SF
Widebody (Group IV)		SF	11,400	11,400	2,900	2,900	2,900						SF
B747/A340 (Group V)		SF	40,100	40,100	44,500	44,500	49,000						SF
A380 (Group VI)		SF	0	6,400	6,400	12,800	19,200						SF
Total Holdroom Area	67,760	SF	54,200	59,800	57,500	63,900	74,800	13,560	7,960	10,260	3,860	(7,040)	SF
Subtotal	212,730	SF	143,700	156,100	151,900	166,900	193,700						SF
DOMESTIC BAGGAGE CLAIM													
Claim Frontage Required	-	LF	110	100	100	100	100						LF
Claim Units	1	units	1	1	1	1	1	0	0	0	0	0	units
Claim Frontage Programmed	308	LF	170	170	170	170	170	138	138	138	138	138	LF
Baggage Claim Area	12,100	SF	6,000	6,000	6,000	6,000	6,000	6,100	6,100	6,100	6,100	6,100	SF
FEDERAL INSPECTION SERVICES													
Primary Inspection:								0	0	0	0	0	
Double Inspection Counters	26	dbl. counters	18	18	18	21	23	8	8	8	5	3	dbl. counters
Counter & Queue Area	37,250	SF	22,900	22,900	22,900	26,700	29,200	14,350	14,350	14,350	10,550	8,050	SF
Baggage Claim:													
Claim Frontage Required	-	LF	1,030	1,040	1,060	1,190	1,350						LF
Claim Units	6	units	5	5	5	6	6	1	1	1	0	0	units
Claim Frontage Programmed	1,598	LF	1,100	1,100	1,100	1,320	1,320	498	498	498	278	278	LF
Baggage Claim Area	68,900	SF	38,500	38,500	38,500	46,200	46,200	30,400	30,400	30,400	22,700	22,700	SF
Subtotal	106,150	SF	61,400	61,400	61,400	72,900	75,400						SF

Table II.3-9
JFK – Terminal Capacity Analysis: Terminal 4

Terminal 4

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
AIRLINE SPACE													
ATO Offices	3,540	SF	21,600	22,200	22,800	25,500	28,800	(18,060)	(18,660)	(19,260)	(21,960)	(25,260)	SF
Airline Operations & Offices (excluding ATO)	91,390	SF	71,100	71,000	74,300	80,000	80,000	20,290	20,390	17,090	11,390	11,390	SF
Baggage Handling													
Estimated make-up capacity	189	carts/LD3s	103	113	107	119	138	86	76	82	71	51	carts/LD3s
Baggage Make-up area	74,190	SF	41,000	45,100	42,800	47,400	55,300	33,190	29,090	31,390	26,790	18,890	SF
Checked Baggage Screening	0	SF	12,800	16,000	16,000	19,200	19,200	(12,800)	(16,000)	(16,000)	(19,200)	(19,200)	SF
Baggage Claim Off-load	29,150	SF	15,000	15,000	15,000	17,500	17,500	14,150	14,150	14,150	11,650	11,650	SF
Airline Clubs & 1st/Bus. Class Lounges	33,170	SF	33,200	35,200	39,000	43,600	49,200	(30)	(2,030)	(5,830)	(10,430)	(16,030)	SF
Baggage Service Offices	5,290	SF	4,600	4,700	4,800	5,400	6,000	690	590	490	(110)	(710)	SF
Subtotal	236,730	SF	199,300	209,200	214,700	238,600	256,000						SF
CONCESSIONS													
Ground Services/Information Counter	650	SF	200	200	200	200	200	450	450	450	450	450	SF
Food/Beverage; Secure	2,200	SF	11,100	13,000	14,400	16,100	18,200	(8,900)	(10,800)	(12,200)	(13,900)	(16,000)	SF
News/Gift/Retail; Secure	0	SF	8,800	10,400	11,500	12,900	14,600	(8,800)	(10,400)	(11,500)	(12,900)	(14,600)	SF
Subtotal; Secure Concessions	2,200	SF	19,900	23,400	25,900	29,000	32,800	(17,700)	(21,200)	(23,700)	(26,800)	(30,600)	SF
Food/Beverage; Non-Secure	27,750	SF	7,400	8,700	9,600	10,800	12,100	20,350	19,050	18,150	16,950	15,650	SF
News/Gift/Retail; Non-Secure	25,190	SF	5,900	7,000	7,700	8,600	9,700	19,290	18,190	17,490	16,590	15,490	SF
Subtotal; Non-Secure Concessions	52,940	SF	13,300	15,700	17,300	19,400	21,800	39,640	37,240	35,640	33,540	31,140	SF
Duty Free	11,550	SF	8,700	10,700	11,800	13,300	15,100	2,850	850	(250)	(1,750)	(3,550)	SF
Other Services	6,020	SF	6,100	7,200	8,000	9,000	10,100	(80)	(1,180)	(1,980)	(2,980)	(4,080)	SF
Concession Support Area	15,480	SF	14,400	17,100	18,900	21,200	23,900	1,080	(1,620)	(3,420)	(5,720)	(8,420)	SF
Subtotal	88,840	SF	62,600	74,300	82,100	92,100	103,900						SF
OTHER PUBLIC AREAS													
Public Seating and Meeter/Greeter Lobbies	44,130	SF	14,600	14,900	15,100	16,900	18,900	29,530	29,230	29,030	27,230	25,230	SF
Restrooms - Terminal Locations	10,980	SF	9,700	9,900	10,100	11,300	12,600	1,280	1,080	880	(320)	(1,620)	SF
Restrooms - Concourse Locations	6,760	SF	7,900	8,600	8,200	9,100	10,600	(1,140)	(1,840)	(1,440)	(2,340)	(3,840)	SF
Subtotal	61,870	SF	32,200	33,400	33,400	37,300	42,100						SF
Vacant spaces suitable for: airline operations	0	SF											SF

[1] - Sources:
Port Authority of NY & NJ,
JFK International Air Terminal LLC - floor plans, July 2000
Hirsh Associates site visit, July 2005
Hirsh Associates Analysis

II.3.5 Terminal 5 Capacity

Gates

T-5's planned 26 gates should be adequate through 2010, and two gates short by 2015. Based on the concept plans, when T-5 is completed, T-6 will have 7 gates remaining in its current configuration. If used by JetBlue, these gates would provide excess capacity through the forecast period. However, the long term use and/or configuration of T-6 has not been firmly established at this time.

Ticketing and Check-in

Although subject to change, the amount of check-in counter frontage and kiosks shown on the T-5 concept plans should have adequate capacity through the forecast period.

The proposed 55' deep ticket lobby is adequate for its activity.

Security Screening, Holdrooms and Circulation

If all of the lanes shown on the preliminary plan are built, T-5 should have excess SSCP capacity through the forecast period.

Concourse corridors are properly sized for its activity.

Holdrooms have adequate capacity through the forecast period.

Domestic Baggage Claim

T-5 will have excess bag claim capacity throughout the forecast period.

Federal Inspection Services Facilities

There are no non-pre-cleared international arrivals forecast to operate at T-5.

Airline Space

T-5 has adequate office/operations capacity over-all through the forecast period.

The terminal has excess baggage make-up capacity through the end of the forecast period. An area for in-line EDS is shown on the concept plans which should be adequately sized for the forecast passenger volumes.

JetBlue does not show an airline club on its T-5 concept plans and does not have a club network.

Based on the concept plans, T-5 appears to have insufficient baggage service office space as compared to typical domestic airline requirements.

Concessions

Approximately 85% of planned concessions will be in secure areas. The planned area would be undersized by 2010 based on typical concessions. However, it has been noted by the PANYNJ that some existing T-6 concessions have very high revenues per square foot which may offset the projected amount of space.

Other Public Areas

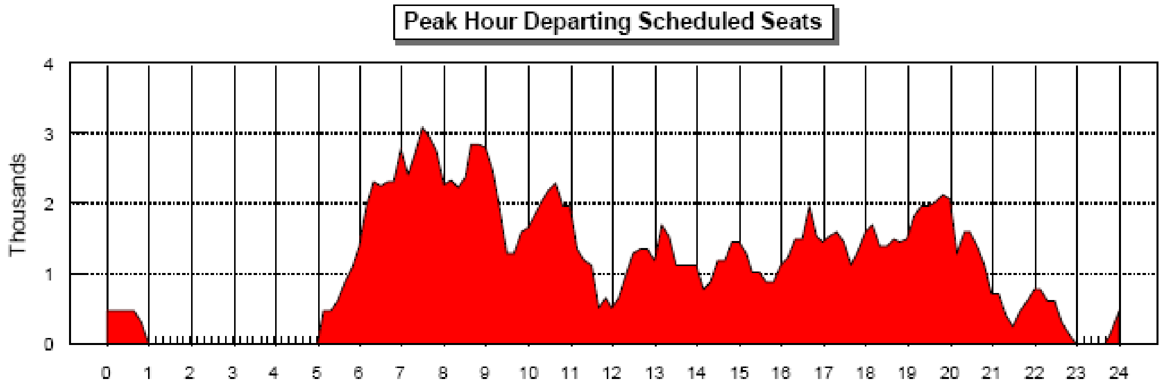
The T-5 concept plans do not have sufficient detail to determine areas for meeter/greeter and waiting areas. However, the general size and configuration of the public circulation areas appears to provide adequate area for these functions.

Non-secure restrooms are undersized based on the concept plans, but secure restrooms are adequate.

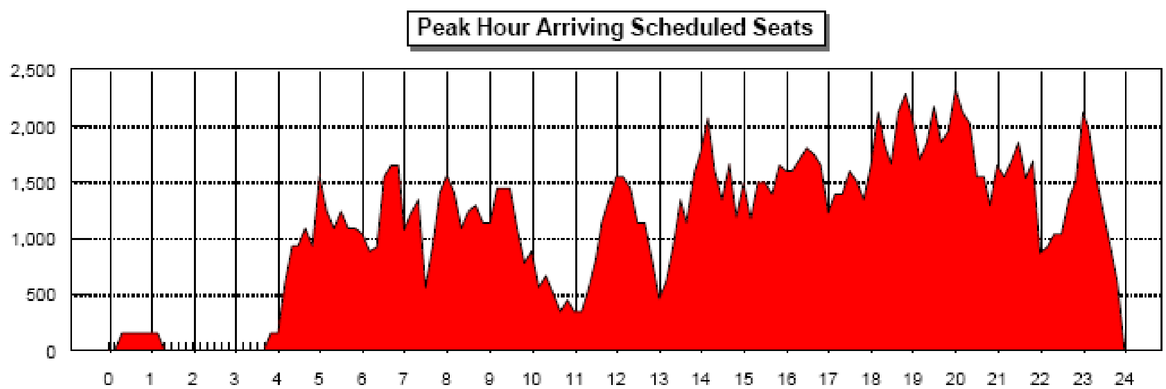
Annual Capacity

T-5 has a wide range of capacities primarily due to the large number of SSCP lanes planned. Based on the other key determinants, T-5 has an effective capacity of 6.4 - 9.0 million enplanements. Baggage claim capacity is higher at 10.1 million enplanements.

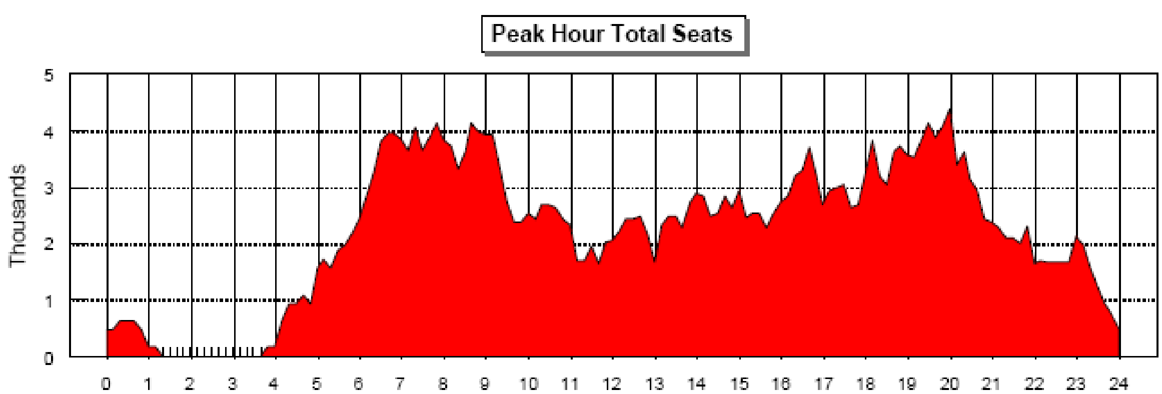
Exhibit II.3-6
JFK – Peak Hour Seats: Terminal 5
(2015 Design Day)



Peak Hour Seats: 3,096 begins at 730 Daily Seats: 26,888
Peak Hour = 11.5% of daily seats



Peak Hour Seats: 2,328 begins at 2000 Daily Seats: 26,732
Peak Hour = 8.7% of daily seats



Peak Hour Seats: 4,400 begins at 2000 Daily Seats: 53,620
Peak Hour = 8.2% of daily seats

Table II.3-10
JFK – Terminal Capacity Analysis: Terminal 5

Terminal 5

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Recommended Facilities - Demand: Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Projected Surplus / (Deficiency): Forecast Year Activity 2010	2015	2020	2025
Annual Enplanements											
Domestic		4,294,534	6,718,200	6,933,800	7,165,900	7,417,400					
International		0	0	0	0	0					
Combined		4,294,534	6,718,200	6,933,800	7,165,900	7,417,400					
Design Hour Factors:											
Domestic Load Factor		95%	95%	95%	95%	95%					
Domestic Connect %		15%	15%	15%	15%	15%					
International Load Factor		0%	0%	0%	0%	0%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		1,260	1,880	2,500	2,580	2,670					
Enplaned Domestic total		1,480	2,210	2,940	3,040	3,150					
Deplaned Domestic O&D		1,130	1,510	1,880	1,940	2,010					
Deplaned Domestic total		1,330	1,770	2,210	2,280	2,360					
Enplaned International O&D		0	0	0	0	0					
Enplaned International total		0	0	0	0	0					
Deplaned International O&D		0	0	0	0	0					
Deplaned International total		0	0	0	0	0					
Meeter/Greeters per O&D Passenger		0.5	0.5	0.5	0.5	0.5					

Table II.3-10
JFK – Terminal Capacity Analysis: Terminal 5

Terminal 5

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	0 gates						0	0	0	0	0 gates
Narrowbody (Group III)	26 gates	12	20	28	29	30	14	6	(2)	(3)	(4) gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	26 gates	12	20	28	29	30	14	6	(2)	(3)	(4) gates
Narrowbody Equivalent Gates (NBEG)	26.0 NBEG	12.0	20.0	28.0	29.0	30.0	14.0	6.0	-2.0	-3.0	-4.0 NBEG
Equivalent Aircraft (EQA)	26.0 EQA	12.0	20.0	28.0	29.0	30.0	14.0	6.0	-2.0	-3.0	-4.0 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	0 gates	0	0	0	0	0	0	0	0	0	0 gates
Narrowbody Equivalent Gates (NBEG)	0.0 NBEG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 NBEG
Equivalent Aircraft (EQA)	0.0 EQA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	42 pos	16	17	23	23	24	26	25	19	19	18 pos
Self-Service Kiosks	44 units	24	33	43	45	46	20	11	1	(1)	(2) units
Equivalent Positions	86 pos	40	50	66	68	70	46	36	20	18	16 pos
Linear Positions	66 pos	31	39	51	53	54	35	27	15	13	12 pos
Counter length	350 LF	160	200	260	270	270	190	150	90	80	80 LF
Ticket Lobby - depth	55 LF	55	55	55	55	55	0	0	0	0	0 LF
Ticket Lobby - area	19,940 SF	9,600	12,000	15,600	16,200	16,200	10,340	7,940	4,340	3,740	3,740 SF
Ticket Counter - International											
Conventional Staffed Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Self-Service Kiosks	0 units	0	0	0	0	0	0	0	0	0	0 units
Equivalent Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Linear Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Counter length	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - depth or separation	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - area	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Ticket Counter - area	4,500 SF	1,600	2,000	2,600	2,700	2,700	2,900	2,500	1,900	1,800	1,800 SF
Subtotal	24,440 SF	11,200	14,000	18,200	18,900	18,900					SF

Table II.3-10
JFK – Terminal Capacity Analysis: Terminal 5

Terminal 5

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
HOLDROOMS & SECURE CIRCULATION													
Security Screening (SSCP) Lanes	20	lanes	6	8	11	11	12	14	12	9	9	8	lanes
Checkpoint/Search Area	29,700	SF	7,900	10,500	14,400	14,400	15,800	21,800	19,200	15,300	15,300	13,900	SF
Secure Circulation	63,680	SF	19,900	33,100	46,400	48,000	49,700	43,780	30,580	17,280	15,680	13,980	SF
Concourse Width	36	LF	30	30	30	30	30	6	6	6	6	6	LF
Sterile (Int'l Arrivals) Circulation	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Holdrooms:													
Regional Aircraft (Groups II & III)		SF	0	0	0	0	0						SF
Narrowbody (Group III)		SF	22,200	37,000	51,800	53,700	55,500						SF
B757 (Group IIIa)		SF	0	0	0	0	0						SF
Widebody (Group IV)		SF	0	0	0	0	0						SF
B747/A340 (Group V)		SF	0	0	0	0	0						SF
A380 (Group VI)		SF	0	0	0	0	0						SF
Total Holdroom Area	65,300	SF	22,200	37,000	51,800	53,700	55,500	43,100	28,300	13,500	11,600	9,800	SF
Subtotal	158,680	SF	50,000	80,600	112,600	116,100	121,000						SF
DOMESTIC BAGGAGE CLAIM													
Claim Frontage Required	-	LF	430	450	560	580	600						LF
Claim Units	6	units	3	3	4	4	4	3	3	2	2	2	units
Claim Frontage Programmed	990	LF	510	510	680	680	680	480	480	310	310	310	LF
Baggage Claim Area	48,200	SF	17,900	17,900	23,800	23,800	23,800	30,300	30,300	24,400	24,400	24,400	SF
FEDERAL INSPECTION SERVICES													
Primary Inspection:								0	0	0	0	0	
Double Inspection Counters	0	dbl. counters	0	0	0	0	0	0	0	0	0	0	dbl. counters
Counter & Queue Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Baggage Claim:													
Claim Frontage Required	-	LF	0	0	0	0	0						LF
Claim Units	0	units	0	0	0	0	0	0	0	0	0	0	units
Claim Frontage Programmed	0	LF	0	0	0	0	0	0	0	0	0	0	LF
Baggage Claim Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Subtotal	0	SF	0	0	0	0	0						SF

Table II.3-10
JFK – Terminal Capacity Analysis: Terminal 5

Terminal 5

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
AIRLINE SPACE													
ATO Offices	11,760	SF	4,800	6,000	7,800	8,100	8,100	6,960	5,760	3,960	3,660	3,660	SF
Airline Operations & Offices (excluding ATO)	112,020	SF	51,600	86,000	120,400	124,700	129,000	60,420	26,020	(8,380)	(12,680)	(16,980)	SF
Baggage Handling													
Estimated make-up capacity	140	carts/LD3s	48	80	112	116	120	92	60	28	24	20	carts/LD3s
Baggage Make-up area	40,480	SF	14,400	24,000	33,600	34,800	36,000	26,080	16,480	6,880	5,680	4,480	SF
Checked Baggage Screening	20,840	SF	9,600	12,800	19,200	19,200	19,200	11,240	8,040	1,640	1,640	1,640	SF
Baggage Claim Off-load	22,240	SF	7,500	7,500	10,000	10,000	10,000	14,740	14,740	12,240	12,240	12,240	SF
Airline Clubs & 1st/Bus. Class Lounges	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Baggage Service Offices	1,480	SF	1,400	1,800	2,300	2,300	2,400	80	(320)	(820)	(820)	(920)	SF
Subtotal	208,820	SF	89,300	138,100	193,300	199,100	204,700						SF
CONCESSIONS													
Ground Services/Information Counter	0	SF	200	200	200	200	200	(200)	(200)	(200)	(200)	(200)	SF
Food/Beverage; Secure	28,100	SF	20,900	32,700	33,700	34,800	36,000	7,200	(4,600)	(5,600)	(6,700)	(7,900)	SF
News/Gift/Retail; Secure	13,890	SF	17,000	26,600	27,500	28,400	29,400	(3,110)	(12,710)	(13,610)	(14,510)	(15,510)	SF
Subtotal; Secure Concessions	41,990	SF	37,900	59,300	61,200	63,200	65,400	4,090	(17,310)	(19,210)	(21,210)	(23,410)	SF
Food/Beverage; Non-Secure	3,160	SF	2,300	3,600	3,700	3,900	4,000	860	(440)	(540)	(740)	(840)	SF
News/Gift/Retail; Non-Secure	4,730	SF	1,900	3,000	3,100	3,200	3,300	2,830	1,730	1,630	1,530	1,430	SF
Subtotal; Non-Secure Concessions	7,890	SF	4,200	6,600	6,800	7,100	7,300	3,690	1,290	1,090	790	590	SF
Duty Free	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Other Services	0	SF	3,000	4,700	4,900	5,000	5,200	(3,000)	(4,700)	(4,900)	(5,000)	(5,200)	SF
Concession Support Area	16,610	SF	11,300	17,700	18,200	18,800	19,500	5,310	(1,090)	(1,590)	(2,190)	(2,890)	SF
Subtotal	66,490	SF	56,600	88,500	91,300	94,300	97,600						SF
OTHER PUBLIC AREAS													
Public Seating and Meeter/Greeter Lobbies	0	SF	2,500	3,400	4,200	4,400	4,500	(2,500)	(3,400)	(4,200)	(4,400)	(4,500)	SF
Restrooms - Terminal Locations	3,140	SF	3,400	4,500	5,600	5,800	6,000	(260)	(1,360)	(2,460)	(2,660)	(2,860)	SF
Restrooms - Concourse Locations	6,540	SF	2,800	4,600	6,400	6,700	6,900	3,740	1,940	140	(160)	(360)	SF
Subtotal	9,680	SF	8,700	12,500	16,200	16,900	17,400						SF
Vacant spaces suitable for:	0	SF											SF

[1] - Sources:
Port Authority of NY & NJ / ArupNAPA - final concept plan, March 2004
Hirsh Associates Analysis

II.3.6 Terminal 6 Capacity

Gates

Based on the concept plans, when T-5 is completed, T-6 will have seven gates remaining in its current configuration. However, the long term use and/or configuration of T-6 has not been firmly established at this time.

Ticketing and Check-in

T-6 would have significant unused check-in capacity.

The ticket lobby will also probably be adequate for domestic activity depending on the type of airline(s) using the terminal in the future.

Security Screening, Holdrooms and Circulation

The terminal should have sufficient SSCP lanes through the forecast period based on likely use of the seven remaining gates.

T-6 does not have conventional concourse corridors. The adequacy of circulation through most of the terminal is dependent on the seating and concessions configurations of the main holdroom/concessions area.

The configuration of T-6 mixes holdroom and concessions seating in the central section. thus understating the effective amount of holdroom seating. However, holdrooms in proximity to the four north gates are considered adequate.

Domestic Baggage Claim

T-6 has a large amount of claim frontage, however separations between claim units, and to walls or other obstructions is constricted.

Federal Inspection Services Facilities

T-6 is anticipated to remain a domestic terminal.

Airline Space

T-6 should have adequate office/operations space for the potential airline(s) using the terminal.

The make-up area and manual EDS equipment as configured by JetBlue should have sufficient capacity to support future activity.

The former TWA club in T-6 was converted to office space by JetBlue, but could be converted back in the future if required.

T-6 has a relatively small amount of baggage service office space, but could be adequate depending on the number and size of airlines using the terminal in the future.

Concessions

Approximately 79% of concessions are located in secure areas. The total amount of concessions is considered adequate for the number of gates which would remain after T-5 opens.

Other Public Areas

T-6 probably has adequate departures seating areas but lacks any arrivals waiting areas.

Restrooms are adequate for potential activity.

Annual Capacity

T-6 capacity has been estimated using JetBlue's activity for 2004 as a surrogate for a future domestic airline. Thus, the actual capacity may vary more for this terminal than for others. As with T-2/3, the large number of check-in positions has significantly more capacity than other key facilities. Based on gates, T-6 has an effective capacity of 2.5 million enplanements. The low holdroom capacity as noted in the facilities analysis section is due to mixing of concessions and holdroom seating, but is considered adequate for the mix of gates.

Table II.3-11
JFK – Terminal Capacity Analysis: Terminal 6

Terminal 6

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
Annual Enplanements											
Domestic		4,294,534	0	0	0	0					
International		0	0	0	0	0					
Combined		4,294,534	0	0	0	0					
Design Hour Factors:											
Domestic Load Factor		95%	0%	0%	0%	0%					
Domestic Connect %		15%	0%	0%	0%	0%					
International Load Factor		0%	0%	0%	0%	0%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		1,260	0	0	0	0					
Enplaned Domestic total		1,480	0	0	0	0					
Deplaned Domestic O&D		1,130	0	0	0	0					
Deplaned Domestic total		1,330	0	0	0	0					
Enplaned International O&D		0	0	0	0	0					
Enplaned International total		0	0	0	0	0					
Deplaned International O&D		0	0	0	0	0					
Deplaned International total		0	0	0	0	0					
Meeter/Greeters per O&D Passenger		0.5	0.5	0.5	0.5	0.5					

Table II.3-11
JFK – Terminal Capacity Analysis: Terminal 6

Terminal 6

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Recommended Facilities - Demand: Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Projected Surplus / (Deficiency): Forecast Year Activity 2010	2015	2020	2025
GATES [3]											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	0 gates						0	0	0	0	0 gates
Narrowbody (Group III)	7 gates	12					(5)	7	7	7	7 gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	7 gates	12	0	0	0	0	(5)	7	7	7	7 gates
Narrowbody Equivalent Gates (NBEG)	7.0 NBEG	12.0	0.0	0.0	0.0	0.0	-5.0	7.0	7.0	7.0	7.0 NBEG
Equivalent Aircraft (EQA)	7.0 EQA	12.0	0.0	0.0	0.0	0.0	-5.0	7.0	7.0	7.0	7.0 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	0 gates	0	0	0	0	0	0	0	0	0	0 gates
Narrowbody Equivalent Gates (NBEG)	0.0 NBEG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 NBEG
Equivalent Aircraft (EQA)	0.0 EQA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	52 pos	16	0	0	0	0	36	52	52	52	52 pos
Self-Service Kiosks	43 units	24	0	0	0	0	19	43	43	43	43 units
Equivalent Positions	95 pos	40	0	0	0	0	55	95	95	95	95 pos
Linear Positions	52 pos	22	0	0	0	0	30	52	52	52	52 pos
Counter length	246 LF	110	0	0	0	0	136	246	246	246	246 LF
Ticket Lobby - depth	44 LF	55	45	45	45	45	(11)	(1)	(1)	(1)	(1) LF
Ticket Lobby - area	10,730 SF	6,600	0	0	0	0	4,130	10,730	10,730	10,730	10,730 SF
Ticket Counter - International											
Conventional Staffed Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Self-Service Kiosks	0 units	0	0	0	0	0	0	0	0	0	0 units
Equivalent Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Linear Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Counter length	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - depth or separation	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - area	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Ticket Counter - area	2,450 SF	1,100	0	0	0	0	1,350	2,450	2,450	2,450	2,450 SF
Subtotal	13,180 SF	7,700	0	0	0	0					SF

Table II.3-11
JFK – Terminal Capacity Analysis: Terminal 6

Terminal 6

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
HOLDROOMS & SECURE CIRCULATION											
Security Screening (SSCP) Lanes	8 lanes	7	0	0	0	0	1	8	8	8	8 lanes
Checkpoint/Search Area	9,570 SF	9,200	0	0	0	0	370	9,570	9,570	9,570	9,570 SF
Secure Circulation	32,170 SF	39,700	0	0	0	0	(7,530)	32,170	32,170	32,170	32,170 SF
Concourse Width	na LF	30	30	30	30	30	na	na	na	na	na LF
Sterile (Int'l Arrivals) Circulation	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Holdrooms:											
Regional Aircraft (Groups II & III)	SF	0	0	0	0	0					SF
Narrowbody (Group III)	SF	22,200	0	0	0	0					SF
B757 (Group IIIa)	SF	0	0	0	0	0					SF
Widebody (Group IV)	SF	0	0	0	0	0					SF
B747/A340 (Group V)	SF	0	0	0	0	0					SF
A380 (Group VI)	SF	0	0	0	0	0					SF
Total Holdroom Area (after gate removal)	8,920 SF	22,200	0	0	0	0	(13,280)	8,920	8,920	8,920	8,920 SF
Subtotal	50,660 SF	71,100	0	0	0	0					SF
DOMESTIC BAGGAGE CLAIM											
Claim Frontage Required	- LF	430	0	0	0	0					LF
Claim Units	4 units	3	0	0	0	0	1	4	4	4	4 units
Claim Frontage Programmed	935 LF	510	0	0	0	0	425	935	935	935	935 LF
Baggage Claim Area	24,090 SF	15,300	0	0	0	0	8,790	24,090	24,090	24,090	24,090 SF
FEDERAL INSPECTION SERVICES											
Primary Inspection:							0	0	0	0	0
Double Inspection Counters	0 dbl. counters	0	0	0	0	0	0	0	0	0	0 dbl. counters
Counter & Queue Area	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Baggage Claim:											
Claim Frontage Required	- LF	0	0	0	0	0					LF
Claim Units	0 units	0	0	0	0	0	0	0	0	0	0 units
Claim Frontage Programmed	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Baggage Claim Area	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Subtotal	0 SF	0	0	0	0	0					SF

Table II.3-11
JFK – Terminal Capacity Analysis: Terminal 6

Terminal 6

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
AIRLINE SPACE											
ATO Offices	7,520 SF	3,300	0	0	0	0	4,220	7,520	7,520	7,520	7,520 SF
Airline Operations & Offices (excluding ATO)	50,400 SF	51,600	0	0	0	0	(1,200)	50,400	50,400	50,400	50,400 SF
Baggage Handling											
Estimated make-up capacity	50 carts/LD3s	48	0	0	0	0	2	50	50	50	50 carts/LD3s
Baggage Make-up area	31,700 SF	14,400	0	0	0	0	17,300	31,700	31,700	31,700	31,700 SF
Checked Baggage Screening	5,000 SF	9,600	0	0	0	0	(4,600)	5,000	5,000	5,000	5,000 SF
Baggage Claim Off-load	9,370 SF	7,500	0	0	0	0	1,870	9,370	9,370	9,370	9,370 SF
Airline Clubs & 1st/Bus. Class Lounges	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Baggage Service Offices	670 SF	1,400	0	0	0	0	(730)	670	670	670	670 SF
Subtotal	104,660 SF	87,800	0	0	0	0					SF
CONCESSIONS											
Ground Services/Information Counter	160 SF	200	0	0	0	0	(40)	160	160	160	160 SF
Food/Beverage; Secure	18,620 SF	20,900	0	0	0	0	(2,280)	18,620	18,620	18,620	18,620 SF
News/Gift/Retail; Secure	4,060 SF	17,000	0	0	0	0	(12,940)	4,060	4,060	4,060	4,060 SF
Subtotal; Secure Concessions	22,680 SF	37,900	0	0	0	0	(15,220)	22,680	22,680	22,680	22,680 SF
Food/Beverage; Non-Secure	2,860 SF	2,300	0	0	0	0	560	2,860	2,860	2,860	2,860 SF
News/Gift/Retail; Non-Secure	3,020 SF	1,900	0	0	0	0	1,120	3,020	3,020	3,020	3,020 SF
Subtotal; Non-Secure Concessions	5,880 SF	4,200	0	0	0	0	1,680	5,880	5,880	5,880	5,880 SF
Duty Free	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Other Services	1,740 SF	3,000	0	0	0	0	(1,260)	1,740	1,740	1,740	1,740 SF
Concession Support Area	15,260 SF	11,300	0	0	0	0	3,960	15,260	15,260	15,260	15,260 SF
Subtotal	45,720 SF	56,600	0	0	0	0					SF
OTHER PUBLIC AREAS											
Public Seating and Meeter/Greeter Lobbies	2,370 SF	2,500	0	0	0	0	(130)	2,370	2,370	2,370	2,370 SF
Restrooms - Terminal Locations	2,860 SF	3,400	0	0	0	0	(540)	2,860	2,860	2,860	2,860 SF
Restrooms - Concourse Locations	3,940 SF	2,800	0	0	0	0	1,140	3,940	3,940	3,940	3,940 SF
Subtotal	9,170 SF	8,700	0	0	0	0					SF
Vacant spaces suitable for:	0 SF										SF

[1] - Sources:
Port Authority of NY & NJ -
floor plans with TWA operations, 1994
Hirsh Associates site visit, July 2005
Hirsh Associates Analysis
[2] - 2004 Jet Blue Activity

II.3.7 Terminal 7 Capacity

Gates

T-7's gate demand is projected to exceed its capacity by 2010. Due to the forecast schedule, active gate management only results in one less gate in 2015 than without towing aircraft (14 vs. 15).

Ticketing and Check-in

T-7 has excess check-in counters through the forecast period.

There is a combination of widely spaced island counters and conventional lobbies for international activity. Some T-7 domestic counters are located in shallow lobbies which are undersized. However, these are currently occupied by EDS equipment and may not be required in the future for higher volume domestic activity.

Security Screening, Holdrooms and Circulation

The terminal should have sufficient SSCP lanes through the forecast period due to a two X-ray per single magnetometer configuration. However, the area per lane would need to be doubled to meet TSA standards.

T-7 does not have a conventional holdroom and circulation configuration in most of the terminal. The amount of circulation space is considered adequate.

Sterile corridors vary in width from less than 9' to 14'.

The configuration of T-7 mixes holdroom and concessions seating in the main portion of the terminal thus understating the effective amount of holdroom seating. There is also a large amount of premium class lounge and airline club space which offsets the shortage of holdrooms for some flights. However, over-all holdrooms are considered undersized.

Domestic Baggage Claim

T-7 has two swing claim units primarily used for domestic flights. This should be adequate through the forecast period due to a slightly de-peaked design day schedule. Separation between claim units and walls is adequate, but can become constricted due to the location of baggage trolley racks.

Federal Inspection Services Facilities

The T-7 FIS has adequate primary inspection positions through the forecast period, but the primary inspection queue depth is inadequate. Using four swing baggage claim units should provide adequate capacity through the forecast period. The separation between some units and location of baggage trolleys provides less circulation space than recommended for the level of activity.

Airline Space

T-7 should be adequate in terms of office space in proximity to the ATO through 2015 as the amount of ATO staff is reduced due to increased kiosk use for both domestic and international passengers. Over-all office and operations space should be adequate through 2015.

Baggage make-up capacity is considered undersized for current and forecast levels of activity. EDS equipment is presently located in the ticket lobby, and an in-line system is not planned at this time.

T-7 has a large UA club and international premium class lounge. BA has a large business class lounge also used by other carriers, as well as a large separate 1st class lounge and dining area. The total amount of space is considered adequate through the forecast
period.

The terminal should have adequate baggage service office space through 2015.

Concessions

Approximately 95% of concessions are located in secure areas of the terminal. The total area is considered adequate though 2010. However, due to the large premium class lounges which serve food, food/beverage concessions may not require as much area as forecast. Duty free space may be less than supportable depending on changes in airline routes.

Other Public Areas

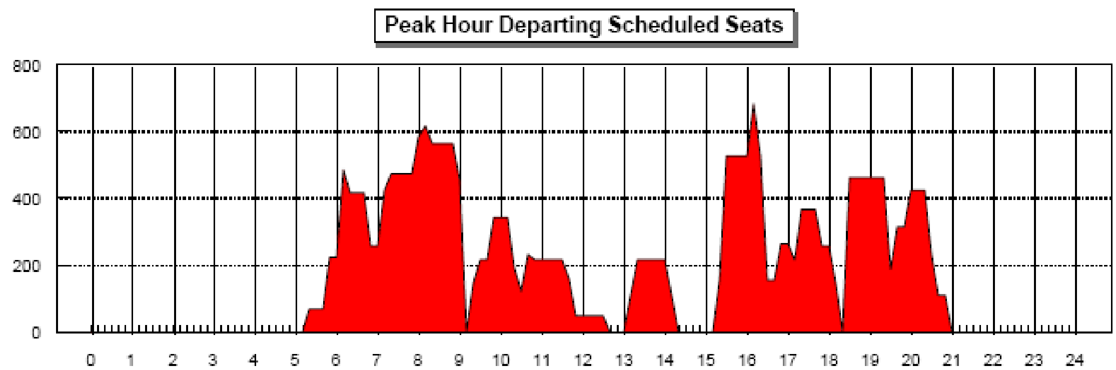
Public seating areas are adequate through the forecast period.

Non-secure and secure restrooms are undersized based on PANYNJ standards. These do not include restrooms within the FIS which serve arriving passengers. However, these are also small and poorly located. Over-all, T-7 is undersized for restroom capacity.

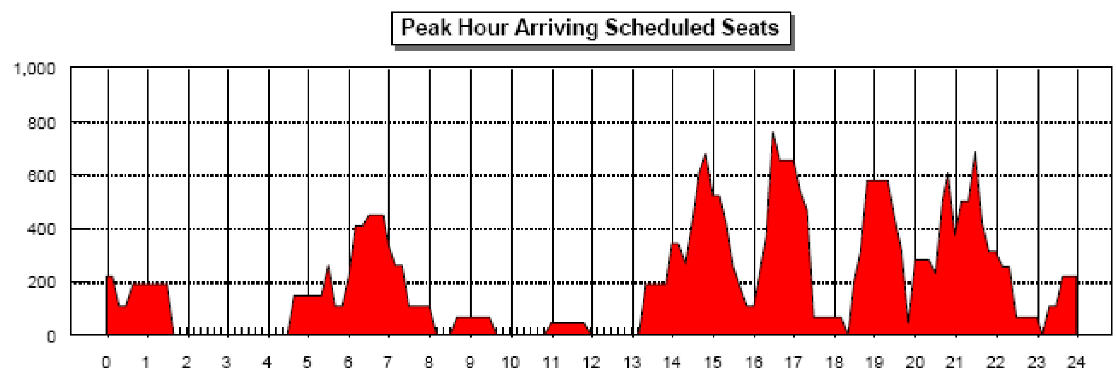
Annual Capacity

T-7 has a wide range of capacities with check-in counters providing the high end, and holdrooms the low end. As with T-6 the low holdroom capacity as noted in the facilities analysis section is due to mixing of concessions and holdroom seating. Based on this wide range, T-7 is estimated to have a capacity of 2.0 - 3.0 million enplanements. The FIS capacity is approximately 2.5 million international enplanements.

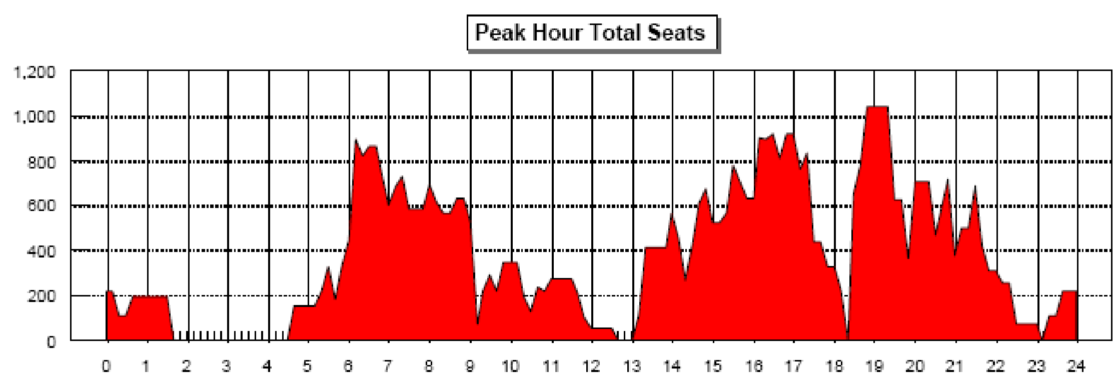
Exhibit II.3-7
JFK – Peak Hour Seats: Terminal 7 (Domestic)
(2015 Design Day)



Peak Hour Seats: 682 begins at 1610 Daily Seats: 4,300
Peak Hour = 15.9% of daily seats

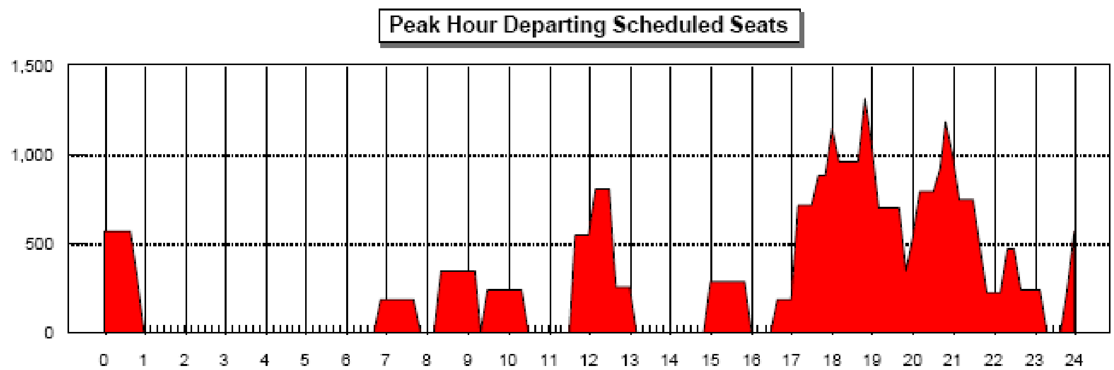


Peak Hour Seats: 764 begins at 1630 Daily Seats: 4,674
Peak Hour = 16.3% of daily seats

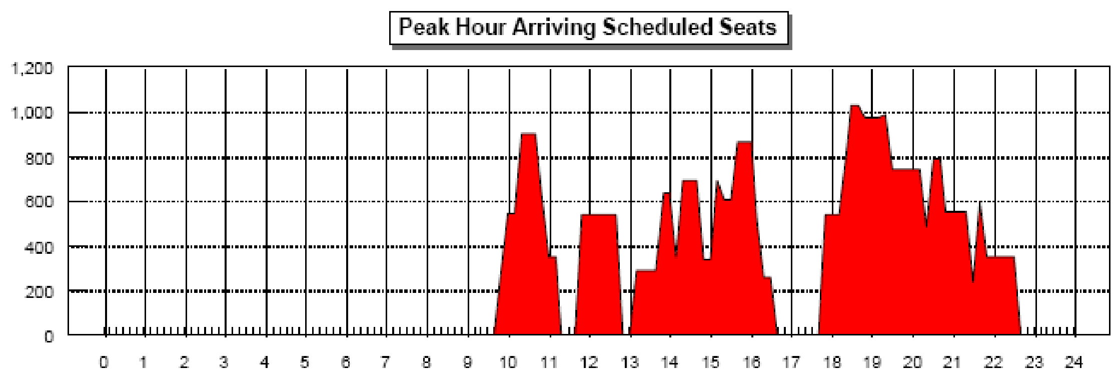


Peak Hour Seats: 1,044 begins at 1920 Daily Seats: 8,974
Peak Hour = 11.6% of daily seats

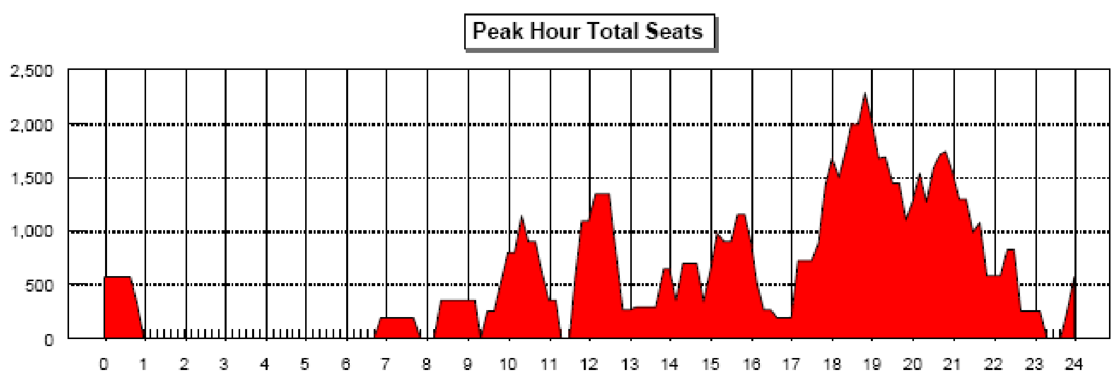
Exhibit II.3-8
JFK – Peak Hour Seats: Terminal 7 (International)
(2015 Design Day)



Peak Hour Seats: 1,311 begins at 1850 — Daily Seats: 6,828
Peak Hour = 19.2% of daily seats



Peak Hour Seats: 1,032 begins at 1830 — Daily Seats: 6,454
Peak Hour = 16.0% of daily seats



Peak Hour Seats: 2,287 begins at 1850 — Daily Seats: 13,282
Peak Hour = 17.2% of daily seats

Table II.3-12
JFK – Terminal Capacity Analysis: Terminal 7

Terminal 7

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand					Projected Surplus / (Deficiency)				
		Base Year Activity	Forecast Year Activity				Base Year Activity	Forecast Year Activity			
		2004	2010	2015	2020	2025	2004	2010	2015	2020	2025
Annual Enplanements											
Domestic		1,009,246	990,900	1,020,400	1,052,200	1,086,700					
International		1,257,914	1,480,900	1,619,700	1,794,200	2,001,600					
Combined		2,267,160	2,471,800	2,640,100	2,846,400	3,088,300					
Design Hour Factors:											
Domestic Load Factor		85%	85%	85%	85%	85%					
Domestic Connect %		0%	0%	0%	0%	0%					
International Load Factor		90%	90%	90%	90%	90%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		770	680	580	600	620					
Enplaned Domestic total		770	680	580	600	620					
Deplaned Domestic O&D		670	660	650	670	690					
Deplaned Domestic total		670	660	650	670	690					
Enplaned International O&D		1,100	1,140	1,180	1,310	1,460					
Enplaned International total		1,100	1,140	1,180	1,310	1,460					
Deplaned International O&D		840	890	930	1,030	1,150					
Deplaned International total		840	890	930	1,030	1,150					
Meeter/Greeters per O&D Passenger		0.6	0.6	0.6	0.6	0.6					

Table II.3-12
JFK – Terminal Capacity Analysis: Terminal 7

Terminal 7

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	0 gates	1					(1)	0	0	0	0 gates
Narrowbody (Group III)	1 gates	1					0	1	1	1	1 gates
B757 (Group IIIa)	0 gates	2	4	5	5	4	(2)	(4)	(5)	(5)	(4) gates
Widebody (Group IV)	6 gates	3	2	1			3	4	5	6	6 gates
B747/A340 (Group V)	5 gates	5	7	8	10	12	0	(2)	(3)	(5)	(7) gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	12 gates	12	13	14	15	16	0	(1)	(2)	(3)	(4) gates
Narrowbody Equivalent Gates (NBEG)	19.5 NBEG	17.9	20.7	22.2	24.5	27.2	1.6	-1.2	-2.7	-5.0	-7.7 NBEG
Equivalent Aircraft (EQA)	26.4 EQA	23.7	28.6	30.8	34.5	38.8	2.7	-2.2	-4.4	-8.1	-12.4 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates	1					(1)	0	0	0	0 gates
Widebody (Group IV)	5 gates	1	1	1			4	4	4	5	5 gates
B747/A340 (Group V)	5 gates	5	6	6	8	8	0	(1)	(1)	(3)	(3) gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	10 gates	7	7	7	8	8	3	3	3	2	2 gates
Narrowbody Equivalent Gates (NBEG)	17.0 NBEG	12.1	12.9	12.9	15.2	15.2	4.9	4.1	4.1	1.8	1.8 NBEG
Equivalent Aircraft (EQA)	23.5 EQA	17.2	18.7	18.7	22.4	22.4	6.3	4.8	4.8	1.1	1.1 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	28 pos	11	9	8	8	8	17	19	20	20	20 pos
Self-Service Kiosks	17 units	15	11	9	10	10	2	6	8	7	7 units
Equivalent Positions	45 pos	26	20	17	18	18	19	25	28	27	27 pos
Linear Positions	42 pos	25	19	16	17	17	17	23	26	25	25 pos
Counter length	208 LF	130	100	80	90	90	78	108	128	118	118 LF
Ticket Lobby - depth	24-47 LF	45	45	45	45	45	2-(21)	2-(21)	2-(21)	2-(21)	2-(21) LF
Ticket Lobby - area	8,770 SF	6,500	5,000	4,000	4,500	4,500	2,270	3,770	4,770	4,270	4,270 SF
Ticket Counter - International											
Conventional Staffed Positions	60 pos	48	47	49	54	60	12	13	11	6	0 pos
Self-Service Kiosks	9 units	5	6	6	7	7	4	3	3	2	2 units
Equivalent Positions	69 pos	53	53	55	61	67	16	16	14	8	2 pos
Linear Positions	60 pos	47	47	48	54	59	13	13	12	6	1 pos
Counter length	319 LF	260	260	260	300	320	59	59	59	19	(1) LF
Ticket Lobby - depth or separation	98 LF	80	80	80	80	80	18	18	18	18	18 LF
Ticket Lobby - area	21,780 SF	11,100	11,100	11,100	12,800	13,600	10,680	10,680	10,680	8,980	8,180 SF
Ticket Counter - area	6,040 SF	4,900	4,600	4,400	5,100	5,400	1,140	1,440	1,640	940	640 SF
Subtotal	36,590 SF	22,500	20,700	19,500	22,400	23,500					SF

Table II.3-12
JFK – Terminal Capacity Analysis: Terminal 7

Terminal 7

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	
HOLDROOMS & SECURE CIRCULATION													
Security Screening (SSCP) Lanes	8	lanes	7	7	6	7	8	1	1	2	1	0	lanes
Checkpoint/Search Area	4,860	SF	9,200	9,200	7,900	9,200	10,500	(4,340)	(4,340)	(3,040)	(4,340)	(5,640)	SF
Secure Circulation	32,930	SF	19,800	22,900	24,500	27,000	30,000	13,130	10,030	8,430	5,930	2,930	SF
Concourse Width	varies	LF	20	20	20	20	20	na	na	na	na	na	LF
Sterile (Int'l Arrivals) Circulation	11,480	SF	10,600	11,300	11,300	13,400	13,400	880	180	180	(1,920)	(1,920)	SF
Holdrooms:													
Regional Aircraft (Groups II & III)		SF	800	0	0	0	0						SF
Narrowbody (Group III)		SF	1,900	0	0	0	0						SF
B757 (Group IIIa)		SF	4,800	9,600	12,000	12,000	9,600						SF
Widebody (Group IV)		SF	8,600	5,700	2,900	0	0						SF
B747/A340 (Group V)		SF	22,300	31,200	35,600	44,500	53,400						SF
A380 (Group VI)		SF	0	0	0	0	0						SF
Total Holdroom Area	27,170	SF	38,400	46,500	50,500	56,500	63,000	(11,230)	(19,330)	(23,330)	(29,330)	(35,830)	SF
Subtotal	76,440	SF	78,000	89,900	94,200	106,100	116,900						SF
DOMESTIC BAGGAGE CLAIM													
Claim Frontage Required	-	LF	520	390	380	390	400						LF
Claim Units	2	units	3	2	2	2	3	(1)	0	0	0	(1)	units
Claim Frontage Programmed	360	LF	540	360	360	360	540	(180)	0	0	0	(180)	LF
Baggage Claim Area	12,120	SF	18,900	12,600	12,600	12,600	18,900	(6,780)	(480)	(480)	(480)	(6,780)	SF
FEDERAL INSPECTION SERVICES													
Primary Inspection:								0	0	0	0	0	
Double Inspection Counters	14	dbl. counters	7	8	8	9	10	7	6	6	5	4	dbl. counters
Counter & Queue Area	9,800	SF	8,900	10,200	10,200	11,400	12,700	900	(400)	(400)	(1,600)	(2,900)	SF
Baggage Claim:													
Claim Frontage Required	-	LF	580	530	550	610	680						LF
Claim Units	3	units	3	3	3	3	4	0	0	0	0	(1)	units
Claim Frontage Programmed	540	LF	600	600	600	600	800	(60)	(60)	(60)	(60)	(260)	LF
Baggage Claim Area	18,140	SF	21,000	21,000	21,000	21,000	28,000	(2,860)	(2,860)	(2,860)	(2,860)	(9,860)	SF
Subtotal	27,940	SF	29,900	31,200	31,200	32,400	40,700						SF

Table II.3-12
JFK – Terminal Capacity Analysis: Terminal 7

Terminal 7

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
AIRLINE SPACE												
ATO Offices	10,170 SF	11,700	10,800	10,200	11,700	12,300	(1,530)	(630)	(30)	(1,530)	(2,130)	SF
Airline Operations & Offices (excluding ATO)	68,400 SF	59,300	60,100	64,700	72,500	81,500	9,100	8,300	3,700	(4,100)	(13,100)	SF
Baggage Handling												
Estimated make-up capacity	56 carts/LD3s	71	86	92	104	116	(15)	(30)	(36)	(48)	(60)	carts/LD3s
Baggage Make-up area	25,600 SF	28,400	34,300	37,000	41,400	46,600	(2,800)	(8,700)	(11,400)	(15,800)	(21,000)	SF
Checked Baggage Screening	0 SF	12,800	12,800	12,800	12,800	16,000	(12,800)	(12,800)	(12,800)	(12,800)	(16,000)	SF
Baggage Claim Off-load	11,130 SF	15,000	12,500	12,500	12,500	17,500	(3,870)	(1,370)	(1,370)	(1,370)	(6,370)	SF
Airline Clubs & 1st/Bus. Class Lounges	49,520 SF	49,500	49,500	49,500	49,500	49,500	20	20	20	20	20	SF
Baggage Service Offices	2,430 SF	2,300	2,300	2,400	2,600	2,800	130	130	30	(170)	(370)	SF
Subtotal	167,250 SF	179,000	182,300	189,100	203,000	226,200						SF
CONCESSIONS												
Ground Services/Information Counter	470 SF	200	200	200	200	200	270	270	270	270	270	SF
Food/Beverage; Secure	19,980 SF	13,300	14,500	15,400	16,700	18,100	6,680	5,480	4,580	3,280	1,880	SF
News/Gift/Retail; Secure	7,320 SF	10,600	11,600	12,400	13,300	14,500	(3,280)	(4,280)	(5,080)	(5,980)	(7,180)	SF
Subtotal; Secure Concessions	27,300 SF	23,900	26,100	27,800	30,000	32,600	3,400	1,200	(500)	(2,700)	(5,300)	SF
Food/Beverage; Non-Secure	930 SF	1,500	1,600	1,700	1,900	2,000	(570)	(670)	(770)	(970)	(1,070)	SF
News/Gift/Retail; Non-Secure	470 SF	1,200	1,300	1,400	1,500	1,600	(730)	(830)	(930)	(1,030)	(1,130)	SF
Subtotal; Non-Secure Concessions	1,400 SF	2,700	2,900	3,100	3,400	3,600	(1,300)	(1,500)	(1,700)	(2,000)	(2,200)	SF
Duty Free	6,510 SF	3,400	4,000	4,400	4,800	5,400	3,110	2,510	2,110	1,710	1,110	SF
Other Services	160 SF	1,100	1,200	1,300	1,400	1,500	(940)	(1,040)	(1,140)	(1,240)	(1,340)	SF
Concession Support Area	1,410 SF	7,800	8,600	9,200	9,900	10,800	(6,390)	(7,190)	(7,790)	(8,490)	(9,390)	SF
Subtotal	37,250 SF	39,100	43,000	46,000	49,700	54,100						SF
OTHER PUBLIC AREAS												
Public Seating and Meeter/Greeter Lobbies	6,210 SF	3,600	3,700	3,800	4,100	4,400	2,610	2,510	2,410	2,110	1,810	SF
Restrooms - Terminal Locations	3,320 SF	4,800	5,000	5,100	5,400	5,900	(1,480)	(1,680)	(1,780)	(2,080)	(2,580)	SF
Restrooms - Concourse Locations	5,810 SF	5,500	6,600	7,100	7,900	8,900	310	(790)	(1,290)	(2,090)	(3,090)	SF
Subtotal	15,340 SF	13,900	15,300	16,000	17,400	19,200						SF
Vacant spaces suitable for: airline operations	5,430 SF											SF

[1] - Sources:
Corgan Associates Architects - as-built renovation drawings, May 2002
Hirsh Associates site visit, July 2005
Hirsh Associates Analysis

II.3.8 Terminal 8 Capacity

Gates

The initial phases of T-8 should have adequate NBEG capacity through 2015, however the forecast fleet mix would require that some gates be reconfigured to accommodate more Group V aircraft.

Ticketing and Check-in

T-8's ultimate mix of staffed counters, kiosks, and utilization for domestic or international flights is not specified in the plans. The existing conditions are based on utilization of counters and kiosk installation as of December 2005, and will likely change as AA fully occupies the initial phases of the terminal. Using these assumptions, T-8 should have adequate total check-in capacity through the end of the forecast period.

The spacing of the island counters is adequate for its activity.

Security Screening, Holdrooms and Circulation

T-8 has sufficient SSCP lanes through the end of the forecast period.

The 32-38' wide concourse corridors are narrower than recommended for moving walks.

Sterile corridors are 20' wide with moving walkways.

Holdrooms are adequately sized for the mix of gates and have adequate capacity through 2015.

Domestic Baggage Claim

T-8 should have adequate bag claim capacity through the end of the forecast period. The claim units have adequate separations.

Federal Inspection Services Facilities

The FIS has adequate primary inspection positions through 2020, but the queuing depth is less than recommended. The three claim units would have adequate capacity only through 2010.

Airline Space

T-8 has adequate office/operations capacity over-all through 2020. The number of tenant airlines (if any) will affect the demand for offices.

The terminal has excess baggage make-up capacity through the end of the forecast period. The area for in-line EDS shown on the plans should also be adequately sized for the forecast passenger volumes. Domestic and international baggage claims have single and dual feed conveyors respectively.

American has two large club locations in T-8 which are considered adequate through the forecast period.

T-8 should have adequate baggage service office space through 2015.

Concessions

With the exception of a small location at baggage claim, all of the concessions are located in the secure areas of the terminal. The exact mix of concessions could not be reliably determined from the plans and may change as the terminal is completed. However, based on the passenger characteristics and airline markets, the total amount of concessions may be undersized.

Other Public Areas

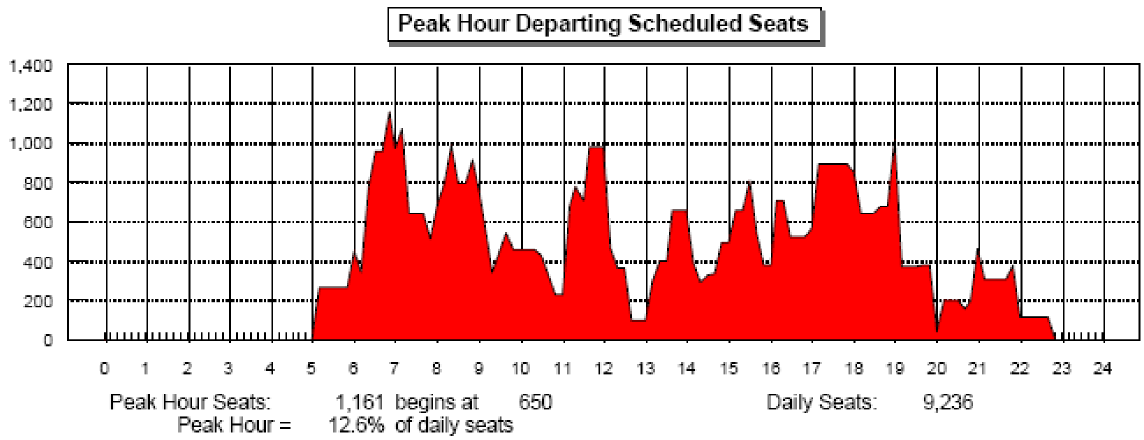
Public seating areas are adequate through the forecast period, but the terminal lacks any designated waiting areas for domestic meeter/greeters.

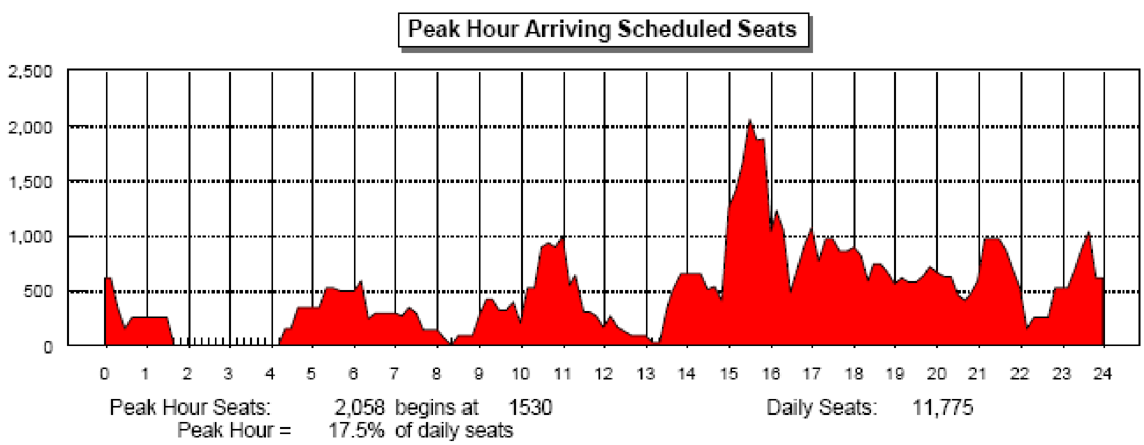
Non-secure restrooms are significantly undersized, but secure restrooms are adequate through 2020.

Annual Capacity

T-8 has a range of capacities. Check-in has the most capacity at 9.3 million combined enplanements followed by SSCP at 6.9 million and gates/holdroom at 5.6 million. Domestic baggage claim has the least capacity with 2.7 million domestic enplanements. The effective capacity is considered to be 5.6 million enplanements based on gates and holdrooms. The FIS has a capacity of 2.1 – 3.3 million international enplanements.

Exhibit II.3-9
JFK – Peak Hour Seats: Terminal 8 (Domestic)
(2015 Design Day)





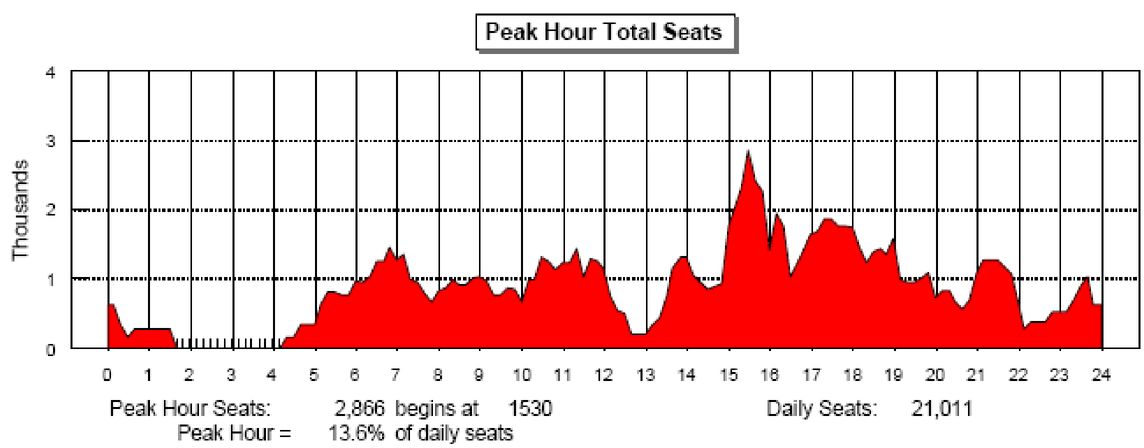
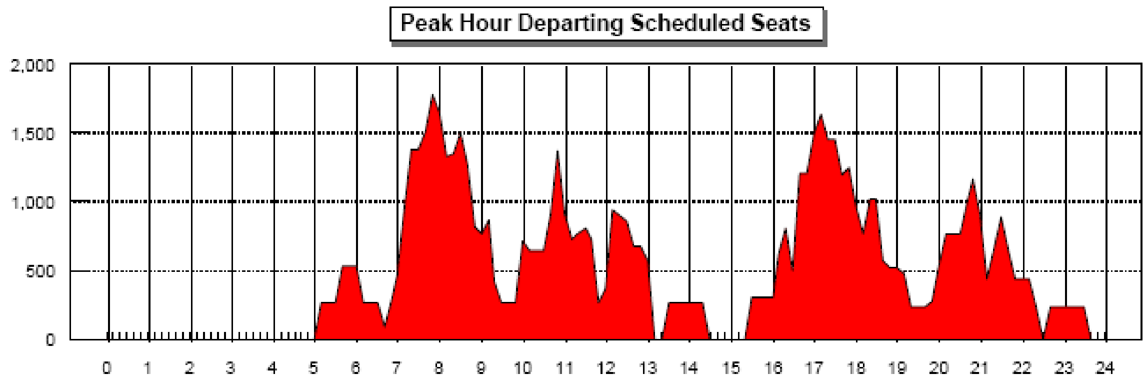
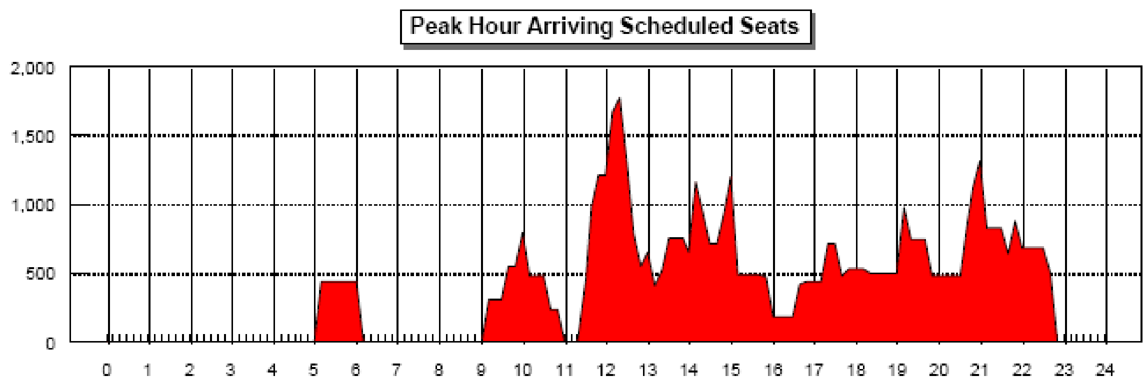


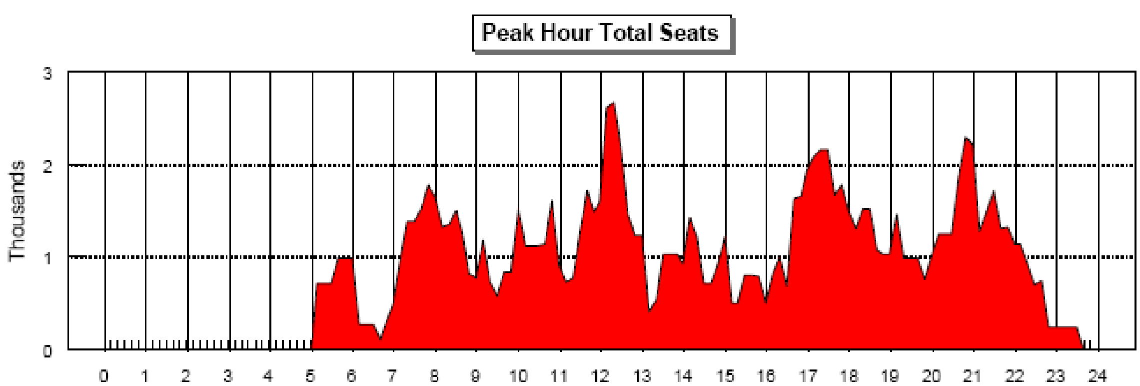
Exhibit II.3-10
JFK – Peak Hour Seats: Terminal 8 (International)
(2015 Design Day)



Peak Hour Seats: 1,784 begins at 750 Daily Seats: 11,693
Peak Hour = 15.3% of daily seats



Peak Hour Seats: 1,778 begins at 1220 Daily Seats: 9,154
Peak Hour = 19.4% of daily seats



Peak Hour Seats: 2,680 begins at 1220 Daily Seats: 20,847
Peak Hour = 12.9% of daily seats

Table II.3-13
JFK – Terminal Capacity Analysis: Terminal 8

Table II.3-13

Terminal Capacity Analysis
John F. Kennedy International Airport
Terminal 8

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand					Projected Surplus / (Deficiency)				
		Base Year Activity	Forecast Year Activity				Base Year Activity	Forecast Year Activity			
		2004 [2]	2010	2015	2020	2025	2004	2010	2015	2020	2025
Annual Enplanements											
Domestic		2,198,388	2,634,500	2,714,000	2,799,600	2,892,600					
International		1,955,427	2,485,900	2,776,700	3,139,800	3,574,300					
Combined		4,153,815	5,120,400	5,490,700	5,939,400	6,466,900					
Design Hour Factors:											
Domestic Load Factor		90%	90%	90%	90%	90%					
Domestic Connect %		10%	20%	20%	20%	20%					
International Load Factor		90%	95%	95%	95%	95%					
International Connect %		20%	20%	20%	20%	20%					
Design Hour Passengers											
Enplaned Domestic O&D		1,110	980	840	870	900					
Enplaned Domestic total		1,230	1,140	1,040	1,070	1,110					
Deplaned Domestic O&D		960	1,220	1,480	1,530	1,580					
Deplaned Domestic total		1,070	1,460	1,850	1,910	1,970					
Enplaned International O&D		1,070	1,220	1,360	1,540	1,750					
Enplaned International total		1,330	1,510	1,690	1,910	2,180					
Deplaned International O&D		870	1,110	1,350	1,530	1,740					
Deplaned International total		1,080	1,390	1,690	1,910	2,180					
Meeter/Greeters per O&D Passenger		0.8	0.8	0.8	0.8	0.8					

Table II.3-13
JFK – Terminal Capacity Analysis: Terminal 8

Table II.3-13

Terminal Capacity Analysis
John F. Kennedy International Airport
Terminal 8

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	9 gates	3	5	6	6	6	6	4	3	3	3 gates
Narrowbody (Group III)	0 gates			3	3	5	0	0	(3)	(3)	(5) gates
B757 (Group IIIa)	1 gates		6	10	10	8	1	(5)	(9)	(9)	(7) gates
Widebody (Group IV)	20 gates	16	12	7	9	11	4	8	13	11	9 gates
B747/A340 (Group V)	2 gates	2	4	6	6	7	0	(2)	(4)	(4)	(5) gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	32 gates	21	27	32	34	37	11	5	0	(2)	(5) gates
Narrowbody Equivalent Gates (NBEG)	41.2 NBEG	29.9	35.7	40.1	43.1	47.8	11.3	5.5	1.1	-1.9	-6.6 NBEG
Equivalent Aircraft (EQA)	48.5 EQA	37.2	43.8	48.5	52.3	58.3	11.3	4.7	0.0	-3.8	-9.8 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates		2	3	3	2	0	(2)	(3)	(3)	(2) gates
Widebody (Group IV)	13 gates	6	3	1	2	3	7	10	12	11	10 gates
B747/A340 (Group V)	1 gates	2	3	4	4	5	(1)	(2)	(3)	(3)	(4) gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	14 gates	8	8	8	9	10	6	6	6	5	4 gates
Narrowbody Equivalent Gates (NBEG)	21.4 NBEG	12.8	12.4	12.4	13.9	16.2	8.6	9.0	9.0	7.5	5.2 NBEG
Equivalent Aircraft (EQA)	27.5 EQA	17.0	16.7	17.0	18.9	22.3	10.5	10.8	10.5	8.6	5.2 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	42 pos	17	12	10	11	11	25	30	32	31	31 pos
Self-Service Kiosks	18 units	19	16	14	14	15	(1)	2	4	4	3 units
Equivalent Positions	60 pos	36	28	24	25	26	24	32	36	35	34 pos
Linear Positions	42 pos	26	20	17	18	19	16	22	25	24	23 pos
Counter length	231 LF	140	110	90	100	100	91	121	141	131	131 LF
Ticket Lobby - depth	77 LF	45	45	45	45	45	32	32	32	32	32 LF
Ticket Lobby - area	11,070 SF	7,000	5,500	4,500	5,000	5,000	4,070	5,570	6,570	6,070	6,070 SF
Ticket Counter - International											
Conventional Staffed Positions	59 pos	52	52	58	66	75	7	7	1	(7)	(16) pos
Self-Service Kiosks	0 units	3	7	8	9	10	(3)	(7)	(8)	(9)	(10) units
Equivalent Positions	59 pos	55	59	66	75	85	4	0	(7)	(16)	(26) pos
Linear Positions	59 pos	55	59	66	75	85	4	0	(7)	(16)	(26) pos
Counter length	331 LF	300	320	360	410	470	31	11	(29)	(79)	(139) LF
Ticket Lobby - depth or separation	77 LF	80	80	80	80	80	(3)	(3)	(3)	(3)	(3) LF
Ticket Lobby - area	15,550 SF	12,800	13,600	15,300	17,400	20,000	2,750	1,950	250	(1,850)	(4,450) SF
Ticket Counter - area	10,650 SF	5,600	5,600	5,900	6,700	7,600	5,050	5,050	4,750	3,950	3,050 SF
Subtotal	37,270 SF	25,400	24,700	25,700	29,100	32,600					SF

Table II.3-13
JFK – Terminal Capacity Analysis: Terminal 8

Terminal Capacity Analysis
John F. Kennedy International Airport
Terminal 8

Table II.3-13

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
HOLDROOMS & SECURE CIRCULATION											
Security Screening (SSCP) Lanes	10 lanes	8	8	8	9	9	2	2	2	1	1 lanes
Checkpoint/Search Area	15,740 SF	10,500	10,500	10,500	11,800	11,800	5,240	5,240	5,240	3,940	3,940 SF
Secure Circulation	118,420 SF	74,300	88,700	99,600	107,100	118,700	44,120	29,720	18,820	11,320	(280) SF
Concourse Width	32-38' LF	45	45	45	45	45	(7-13)	(7-13)	(7-13)	(7-13)	(7-13) LF
Sterile (Int'l Arrivals) Circulation	55,790 SF	15,000	14,500	14,500	16,300	19,000	40,790	41,290	41,290	39,490	36,790 SF
Holdrooms:											
Regional Aircraft (Groups II & III)	SF	2,400	4,000	4,800	4,800	4,800					SF
Narrowbody (Group III)	SF	0	0	5,600	5,600	9,300					SF
B757 (Group IIIa)	SF	0	14,400	24,000	24,000	19,200					SF
Widebody (Group IV)	SF	45,600	34,200	20,000	25,700	31,400					SF
B747/A340 (Group V)	SF	8,900	17,800	26,700	26,700	31,200					SF
A380 (Group VI)	SF	0	0	0	0	0					SF
Total Holdroom Area	82,605 SF	56,900	70,400	81,100	86,800	95,900	25,705	12,205	1,505	(4,195)	(13,295) SF
Subtotal	272,555 SF	156,700	184,100	205,700	222,000	245,400					SF
DOMESTIC BAGGAGE CLAIM											
Claim Frontage Required	- LF	420	470	570	590	610					LF
Claim Units	3 units	2	2	3	3	3	1	1	0	0	0 units
Claim Frontage Programmed	660 LF	440	440	660	660	660	220	220	0	0	0 LF
Baggage Claim Area	22,450 SF	15,400	15,400	23,100	23,100	23,100	7,050	7,050	(650)	(650)	(650) SF
FEDERAL INSPECTION SERVICES											
Primary Inspection:							0	0	0	0	0
Double Inspection Counters	18 dbl. counters	9	12	15	16	19	9	6	3	2	(1) dbl. counters
Counter & Queue Area	18,720 SF	11,400	15,200	19,100	20,300	24,100	7,320	3,520	(380)	(1,580)	(5,380) SF
Baggage Claim:											
Claim Frontage Required	- LF	670	810	980	1,110	1,270					LF
Claim Units	3 units	3	3	4	4	5	0	0	(1)	(1)	(2) units
Claim Frontage Programmed	840 LF	840	840	1,120	1,120	1,400	0	0	(280)	(280)	(560) LF
Baggage Claim Area	30,180 SF	29,400	29,400	39,200	39,200	49,000	780	780	(9,020)	(9,020)	(18,820) SF
Subtotal	48,900 SF	40,800	44,600	58,300	59,500	73,100					SF

Table II.3-13
JFK – Terminal Capacity Analysis: Terminal 8

Terminal Capacity Analysis
John F. Kennedy International Airport
Terminal 8

Table II.3-13

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004 [2]	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
AIRLINE SPACE											
ATO Offices	7,760 SF	13,200	12,900	13,500	15,300	17,100	(5,440)	(5,140)	(5,740)	(7,540)	(9,340) SF
Airline Operations & Offices (excluding ATO)	156,140 SF	104,200	122,600	135,800	146,400	163,200	51,940	33,540	20,340	9,740	(7,060) SF
Baggage Handling											
Estimated make-up capacity	211 carts/LD3s	112	131	146	157	175	99	80	66	54	36 carts/LD3s
Baggage Make-up area	57,150 SF	30,100	35,500	39,300	42,400	47,200	27,050	21,650	17,850	14,750	9,950 SF
Checked Baggage Screening	53,950 SF	16,000	16,000	16,000	16,000	19,200	37,950	37,950	37,950	37,950	34,750 SF
Baggage Claim Off-load	34,200 SF	12,500	12,500	17,500	17,500	20,000	21,700	21,700	16,700	16,700	14,200 SF
Airline Clubs & 1st/Bus. Class Lounges	37,900 SF	37,900	37,900	37,900	37,900	37,900	0	0	0	0	0 SF
Baggage Service Offices	4,830 SF	3,100	3,900	4,800	5,200	5,600	1,730	930	30	(370)	(770) SF
Subtotal	351,930 SF	217,000	241,300	264,800	280,700	310,200					SF
CONCESSIONS											
Ground Services/Information Counter	300 SF	200	200	200	200	200	100	100	100	100	100 SF
Food/Beverage; Secure	39,320 SF	24,300	30,000	32,100	34,700	37,800	15,020	9,320	7,220	4,620	1,520 SF
News/Gift/Retail; Secure	12,610 SF	19,400	24,000	25,700	27,800	30,300	(6,790)	(11,390)	(13,090)	(15,190)	(17,690) SF
Subtotal; Secure Concessions	51,930 SF	43,700	54,000	57,800	62,500	68,100	8,230	(2,070)	(5,870)	(10,570)	(16,170) SF
Food/Beverage; Non-Secure	0 SF	2,700	3,300	3,600	3,900	4,200	(2,700)	(3,300)	(3,600)	(3,900)	(4,200) SF
News/Gift/Retail; Non-Secure	580 SF	2,200	2,700	2,900	3,100	3,400	(1,620)	(2,120)	(2,320)	(2,520)	(2,820) SF
Subtotal; Non-Secure Concessions	580 SF	4,900	6,000	6,500	7,000	7,600	(4,320)	(5,420)	(5,920)	(6,420)	(7,020) SF
Duty Free (not identified on plans)	0 SF	5,300	6,700	7,500	8,500	9,700	(5,300)	(6,700)	(7,500)	(8,500)	(9,700) SF
Other Services (not identified on plans)	0 SF	2,900	3,600	3,800	4,200	4,500	(2,900)	(3,600)	(3,800)	(4,200)	(4,500) SF
Concession Support Area	7,960 SF	14,200	17,600	18,900	20,600	22,500	(6,240)	(9,640)	(10,940)	(12,640)	(14,540) SF
Subtotal	60,770 SF	71,200	88,100	94,700	103,000	112,600					SF
OTHER PUBLIC AREAS											
Public Seating and Meeter/Greeter Lobbies	12,800 SF	4,900	6,300	7,600	8,300	9,000	7,900	6,500	5,200	4,500	3,800 SF
Restrooms - Terminal Locations	3,550 SF	6,600	8,400	10,200	11,000	12,000	(3,050)	(4,850)	(6,650)	(7,450)	(8,450) SF
Restrooms - Concourse Locations	12,380 SF	8,600	10,100	11,200	12,000	13,400	3,780	2,280	1,180	380	(1,020) SF
Subtotal	28,730 SF	20,100	24,800	29,000	31,300	34,400					SF
Vacant spaces suitable for: airline offices	34,400 SF										SF

[1] - Sources:
Silvester + Tafuro Architects - architectural plans, April 2005
DMJM Aviation - occupancy analysis, February 2005
Hirsh Associates site visit, December 2005
Hirsh Associates Analysis
[2] - 2004 activity for Terminals 8 & 9

II.3.9 Annual Airport Terminal Capacity

In total, using the key determinants, JFK would have a terminal capacity range of 24.4 - 55.45 million enplanements. Using the more effective capacities described for each terminal, the terminal capacity range is 24.4 - 31.6 million enplanements. See Table II.3-13.

In summary, (million annual enplanement capacities):

	Minimum	Maximum	Effective Maximum	Based on
Terminal 1	1.5	2.0	2.0	check-in, holdroom & gates
Terminals 2 & 3	4.1	11.7	4.6	holdroom
Terminal 4	3.7	4.9	4.9	check-in, holdroom & gates
Terminal 5	6.4	12.6	9.0	check-in & holdroom
Terminal 6	1.7	10.2	2.5	gates
Terminal 7	1.4	4.7	3.0	SSCP & gates
Terminal 8	5.6	9.3	5.6	,holdroom & gates
Total	24.4	51.7	31.6	

Table II.3-14
JFK – Annual Capacity Estimates

Key Determinants of Annual Capacity

Annual Capacity Estimates
John F. Kennedy International Airport

Table II.3-14

Key Determinants of Annual Capacity

A. Domestic Equivalent Check-in Positions

	Existing Facilities (positions)	Design Hour Capacity (O&D enplanements)	Annual Capacity (domestic enplanements)
Terminal 1	0	0	0.0
Terminals 2 & 3	91	4,400	9.3
Terminal 4	12	290	0.2
Terminal 5	86	3,260	9.0
Terminal 6	95	2,990	10.2
Terminal 7	45	1,540	2.7
Terminal 8	60	2,100	6.8
		Airport Total Capacity:	**38.2 million domestic**

B. International Equivalent Check-in Positions

	Existing Facilities (positions)	Design Hour Capacity (O&D enplanements)	Annual Capacity (international enplanements)
Terminal 1	96	1,810	2.0
Terminals 2 & 3	84	1,940	2.4
Terminal 4	146	3,220	4.7
Terminal 5	0	0	0.0
Terminal 6	0	0	0.0
Terminal 7	69	1,480	2.0
Terminal 8	59	1,220	2.5
		Airport Total Capacity:	**13.6 million international**

C. Security Screening (SSCP) Lanes

	Existing Facilities (lanes)	Design Hour Capacity (O&D enplanements)	Annual Capacity (combined enplanements)
Terminal 1	7	1,410	1.5
Terminals 2 & 3	18	3,130	5.5
Terminal 4	13	2,640	3.7
Terminal 5	20	4,550	12.6
Terminal 6	8	1,440	4.9
Terminal 7	8	2,350	3.5
Terminal 8	10	2,750	6.9
		Airport Total Capacity:	**38.6 million combined**

Source: Hirsh Associates 06/15/2007 Table II.3-14 - Page 1 JFK_CAP.\

Table II.3-14
JFK – Annual Capacity Estimates

Key Determinants of Annual Capacity (Con't)

Annual Capacity Estimates
John F. Kennedy International Airport

Table II.3-14

D. Contact Gates

	Existing Facilities (NBEG)	Design Hour Capacity (NBEG)	Annual Capacity (combined enplanements)
Terminal 1	18.6	18.6	1.9
Terminals 2 & 3	43.3	43.3	4.1
Terminal 4	30.0	30.0	4.8
Terminal 5	26.0	26.0	6.4
Terminal 6	7.0	7.0	2.5
Terminal 7	19.5	19.5	2.3
Terminal 8	41.2	41.2	5.6
		Airport Total Capacity:	**27.6 million combined**

E. Holdrooms

	Existing Facilities (square feet)	Design Hour Capacity (EQA)	Annual Capacity (combined enplanements)
Terminal 1	45,870	28.6	2.0
Terminals 2 & 3	90,490	54.3	4.6
Terminal 4	67,760	42.1	4.7
Terminal 5	65,300	35.3	8.7
Terminal 6	8,920	4.8	1.7
Terminal 7	27,170	16.6	1.4
Terminal 8	82,605	49.4	5.6
		Airport Total Capacity:	**28.7 million combined**

Source: Hirsh Associates 06/15/2007 Table II.3-14 - Page 2 JFK_CAP.\

Table II.3-15
JFK – Annual Capacity Estimates

Secondary Determinants of Annual Capacity

Annual Capacity Estimates
John F. Kennedy International Airport

Table II.3-14

Secondary Determinants of Annual Capacity

A. Domestic Baggage Claim

	Existing Facilities (linear feet)	Design Hour Capacity (O&D deplanements)	Annual Capacity (domestic enplanements)
Terminal 1	0	0	0.0
Terminals 2 & 3	660	1,660	4.1
Terminal 4	308	430	0.3
Terminal 5	990	2,740	10.1
Terminal 6	935	2,070	7.9
Terminal 7	360	650	1.0
Terminal 8	660	1,480	2.7
		Airport Total Capacity:	**26.1 million domestic**

B. International Primary Inspection

	Existing Facilities (positions)	Design Hour Capacity (deplanements)	Annual Capacity (international enplanements)
Terminal 1	17	1,990	3.0
Terminals 2 & 3	17	1,940	1.4
Terminal 4	26	3,120	5.5
Terminal 5	0	0	0.0
Terminal 6	0	0	0.0
Terminal 7	14	1,630	2.8
Terminal 8	18	2,030	3.3
		Airport Total Capacity:	**16.0 million international**

C. International Baggage Claim

	Existing Facilities (linear feet)	Design Hour Capacity (deplanements)	Annual Capacity (international enplanements)
Terminal 1	1,090	2,130	3.2
Terminals 2 & 3	1,175	1,900	1.4
Terminal 4	1,598	3,140	5.6
Terminal 5	0	0	0.0
Terminal 6	0	0	0.0
Terminal 7	540	840	1.5
Terminal 8	840	1,270	2.1
		Airport Total Capacity:	**13.8 million international**

Source: Hirsh Associates 06/15/2007 Table II.3-14 - Page 3 JFK_CAP.\

Table II.3-16
JFK – Annual Capacity Estimates

Summary of Annual Capacity Estimates

Annual Capacity Estimates
John F. Kennedy International Airport

Table II.3-

Summary of Annual Capacity Estimates

Key Determinants -

	Million Annual Enplanements Based on:						Capacity Rang	
	Check-in Positions			SSCP	Gates	Holdrooms		
	Dom.	Int'l	Combined	Lanes				
Terminal 1	0.0	2.0	2.0	1.5	1.9	2.0	1.5 -	2.
Terminals 2 & 3	9.3	2.4	11.7	5.5	4.1	4.6	4.1 -	11.
Terminal 4	0.2	4.7	4.9	3.7	4.8	4.7	3.7 -	4.
Terminal 5	9.0	0.0	9.0	12.6	6.4	8.7	6.4 -	12.
Terminal 6	10.2	0.0	10.2	4.9	2.5	1.7	1.7 -	10.
Terminal 7	2.7	2.0	4.7	3.5	2.3	1.4	1.4 -	4.
Terminal 8	6.8	2.5	9.3	6.9	5.6	5.6	5.6 -	9.
				Airport Total Capacity Range:			**24.4 -**	**55.**
							million enplanement	

Secondary Determinants -

	Million Annual Enplanements Based on:				Capacity Rang	
	Baggage Claim			Primary Inspection	International	
	Dom.	Int'l	Combined	Int'l		
Terminal 1	0.0	3.2	3.2	3.0	3.0 -	3.
Terminals 2 & 3	4.1	1.4	5.5	1.4	1.4 -	1.
Terminal 4	0.3	5.6	5.9	5.5	5.5 -	5.
Terminal 5	10.1	0.0	10.1	0.0	0.0 -	0.
Terminal 6	7.9	0.0	7.9	0.0	0.0 -	0.
Terminal 7	1.0	1.5	2.5	2.8	1.5 -	2.
Terminal 8	2.7	2.1	4.8	3.3	2.1 -	3.
Airport Total Capacity Ranges:			**39.9 million enplanements**		**13.5 -**	**16.**
					million international enplanement	

Source: Hirsh Associates 06/15/2007 Table II.3-14 - Page 4 JFK_CAP.\

II.4 On-Airport Roadway & Terminal Frontage Capacity

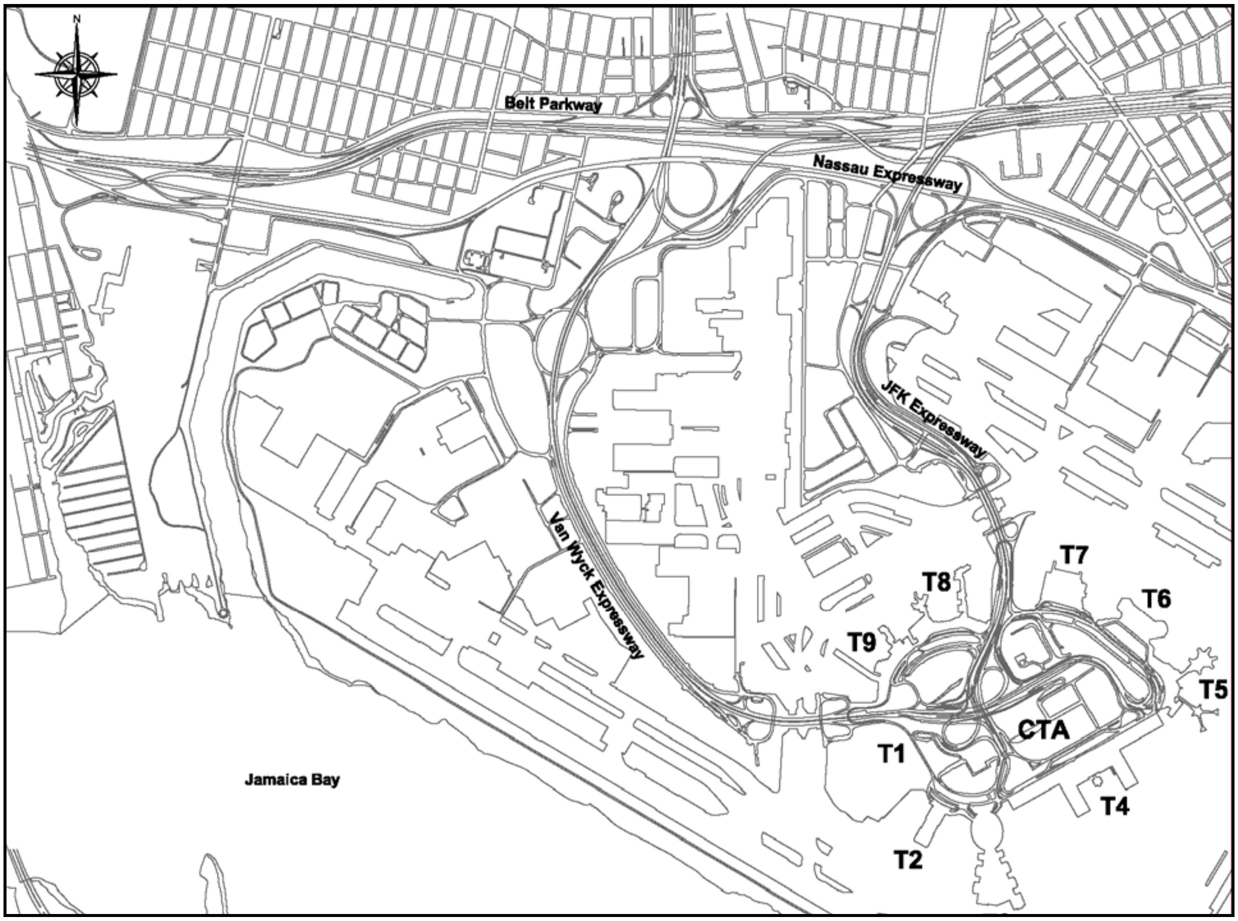
II.4.1 On-Airport Roadways

The on-airport roadway system at Kennedy Airport, consists of the primary access, circulation and service roads that serve the extensive landside airport area south of Nassau Expressway. However, from the perspective of air passengers, the roadways most used are the on-airport gateway roadways- the Van Wyck and JFK Expressways, which connect the off-airport roadway system to the Central Terminal Area (CTA), and the roadways of the CTA itself. The CTA roadway network was nearly completely reconfigured in the 1990's, integrated with functionality of the newly constructed JFK and Nassau Expressways. The overall layout of the Kennedy Airport on-airport roadways is provided on Exhibit II.4-1.

The on-airport Van Wyck Expressway (VWE) connects with the off-airport Van Wyck Expressway (I-678), North Conduit Avenue and Nassau Expressway, providing access to the airport from the north, east and west. JFK Expressway connects with the Belt Parkway, North Conduit Avenue and Nassau Expressway, primarily providing access to the airport from the east. The Central Terminal Area is basically divided into five quadrants (Green-Terminals 1-3, Blue-Terminal 4, Yellow-Terminals 5, 6, Orange-Terminal 7, and Red-Terminals 8, 9). Each quadrant also has adjacent parking facilities designated to it. The CTA roadway system generally provides connections between the extensions of VWE and JFK Expressways to and from each quadrant. However, the connecting roadways often carry traffic destined to or originating from more than one quadrant and connections to and/or from a quadrant's parking facility may be different from its terminal frontage connections.

Several other JFK air passenger related operations affect traffic distribution on its on-airport roadway system. The taxi hold is located off JFK Expressway outside the CTA. Taxis that drop off a fare at a terminal or arrive at the airport empty must enter the taxi hold and wait in queue before proceeding to a terminal to pick up a fare. Other for hire vehicles (black cars) are not required to enter the taxi hold, but are restricted to picking up previously arranged fares. These operators usually park in the CTA daily parking lots. The rental car pick-up and drop-off is northeast of Federal Circle with an AirTrain stop available for travel to and from the CTA. Likewise, the long term parking areas are on-airport outside the CTA with either AirTrain or shuttle bus service to and from the CTA (see Section II.5 for a discussion of JFK parking).

Exhibit II.4-1
JFK Airport Overall Layout



II.4.2 Critical Roadway Segments

Thirty-five critical on-airport roadway segments were identified at Kennedy Airport, as illustrated on Exhibit II.4-2A and II.4-2B. These segments include those entering and leaving the airport to and from off-airport Van Wyck Expressway, Nassau Expressway and Belt Parkway, as well as those entering and leaving the CTA to and from the Van Wyck and JFK Expressway corridors, the central loop ramps and the CTA roadway spine leading to and from Terminals 4 through 7.

II.4.3 On-Airport Roadway Capacity and Operations

In order to analyze the operations of each critical roadway segment under baseline as well as future forecast traffic levels, threshold values for LOS C through LOS E (the flow at the transition point to the next LOS, i.e. LOS C to LOS D) were derived for each critical segment as well as baseline 2004, forecast 2015 and 2025 AM and PM peak hour traffic volumes, as discussed in Section I.4. The LOS threshold values for each roadway segment, segment traffic volumes for 2004 baseline, 2015 and 2025 forecasts and segment levels of service under each traffic demand condition are provided in Table II.4-1 and II.4-2 for AM and PM peak hours, respectively.

As shown, under 2004 baseline conditions, all roadway segments within the CTA operate at LOS C or better except on outbound Segment 12 during the PM peak hour, the exiting segment to the Van Wyck Expressway from Terminals 1-3 and the Blue Parking. Several instances of LOS D operations or worse were identified on the connecting segments to the off airport roadway system. During the AM peak hour, this includes LOS D operations on the two-lane inbound ramp connecting the off-airport to on-airport Van Wyck Expressway (Segment 19) and the one lane outbound ramp from JFK Expressway to Nassau Expressway and North Conduit Avenue (Segment 31). During the PM peak hour, analysis indicated that operations on these ramps degrade further to a level at or exceeding theoretical capacity. Additionally, Segments 20 and 21, which also provide inbound access from the off-airport Van Wyck and Nassau Expressways are indicated to operate at levels approaching capacity and the four lane ramp to the off-airport Van Wyck Expressway (Segment 25) operates in LOS D.

Additionally, it should be noted that other roadway operational deficiencies may be present within the CTA that were not identified under critical link analysis. Roadway segments in proximity to terminal frontages, which are frequently controlled by traffic signals, were not analyzed in that they present a more localized condition rather than a representation of the functionality of the on-airport roadway network. The Port Authority advised that the exit from the Terminal 6 frontage is a problem location as such. Also, the Port Authority advised that Segment 17 had a capacity deficiency and is scheduled to be widened to two lanes. Based upon the analysis performed for this study, it appears that the deficiency at this location is the ramp single lane entrance in conjunction with release of traffic from the upstream traffic signal rather than the ramp proper capacity itself. In the near term, roadways leading to and from the reconstructed Terminal 5 will be modified, but the layout critical links will not change.

Exhibit II.4-2A
JFK – On Airport Critical Roadway Segments

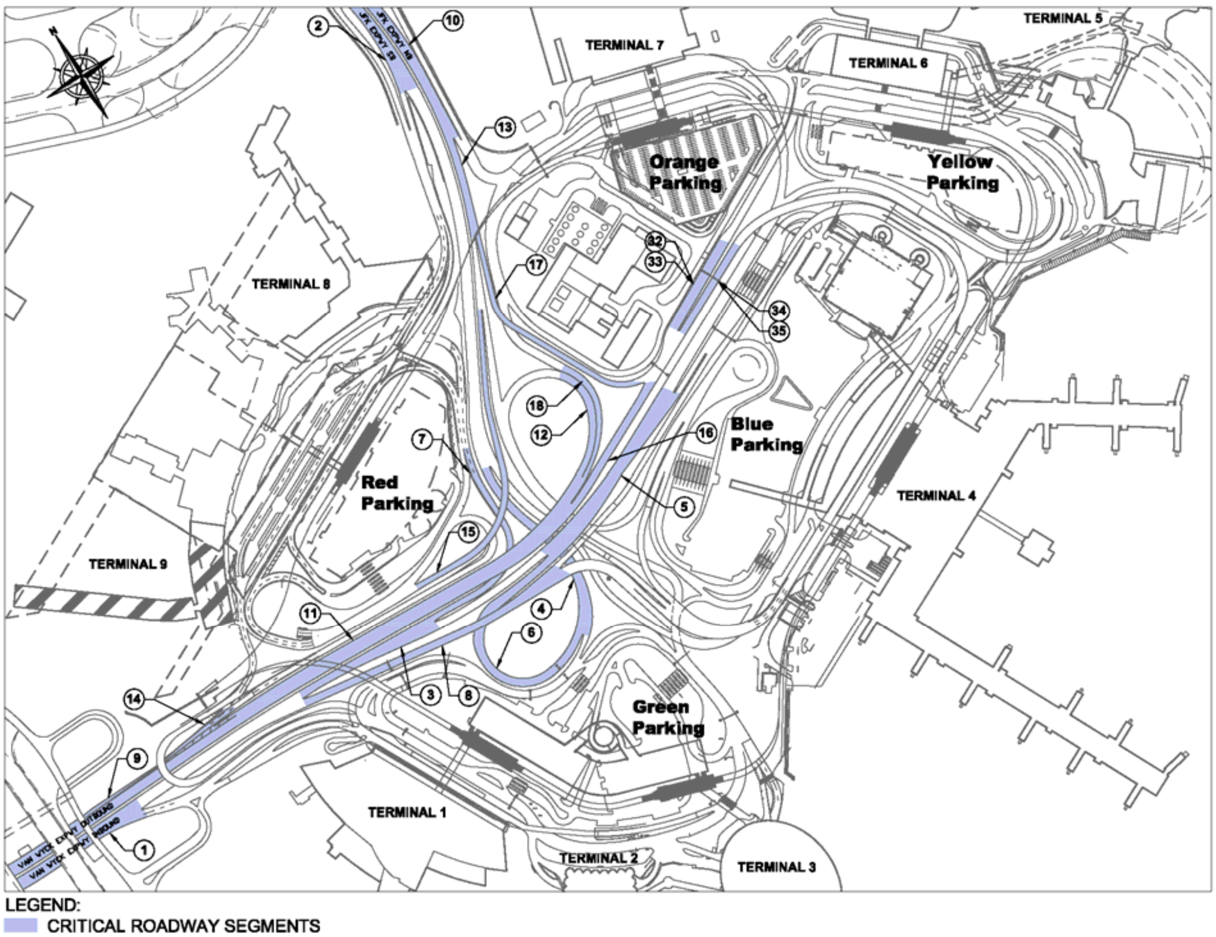


Exhibit II.4-2B
JFK – On Airport Critical Roadway Segments

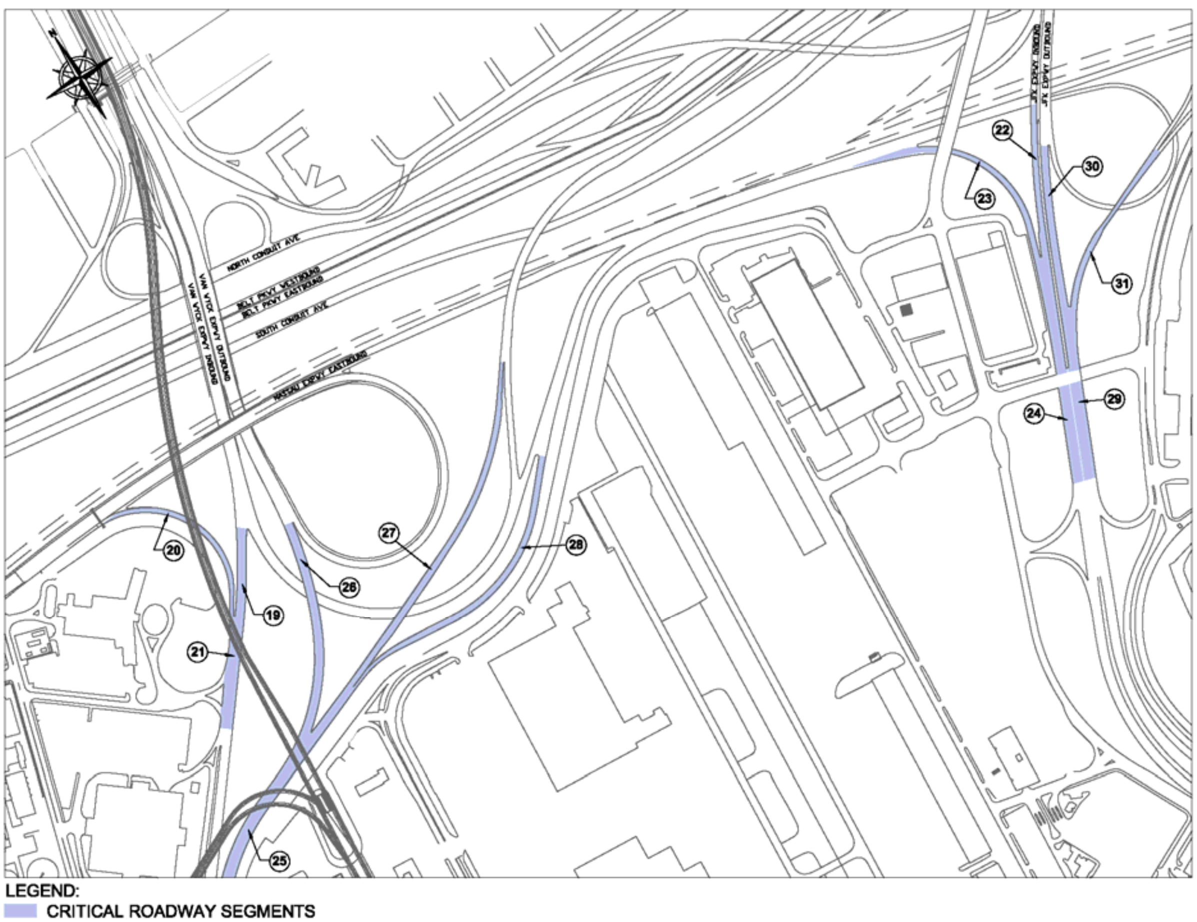


Table II.4-1
JFK On-Airport Critical Roadway Segments (AM)

	AIRPORT ROADWAY DESCRIPTION	Base Year 2004 AM Peak Traffic (Vehicles/Hour)	Forecast 2015 AM Peak Traffic (Vehicles/Hour)	Forecast 2025 AM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
INBOUND TO CENTRAL TERMINAL AREA							
1	Van Wyck Expwy (on-airport)	2,880 (≥ C)	3,570 (≥ C)	4,130 (D)	3,900	5,130	6,000
2	JFK Expwy	1,510 (≥ C)	1,940 (≥ C)	2,250 (≥ C)	3,900	5,130	6,000
3	Van Wyck Expwy to Terminals 5-9 and Blue Parking	1,380 (≥ C)	1,970 (≥ C)	2,220 (≥ C)	2,340	3,100	3,800
4	JFK Expwy to Terminals 1-3, 5-7 and Blue Parking	700 (≥ C)	1,050 (≥ C)	1,170 (≥ C)	2,150	2,850	3,500
5	Van Wyck Expwy and JFK Expwy to Terminals 5-7 and Blue Parking	1,280 (≥ C)	2,100 (≥ C)	2,300 (≥ C)	2,925	3,875	4,750
6	JFK Expwy to Terminals 5-7 and Blue Parking via Loop Ramp	520 (≥ C)	530 (≥ C)	580 (≥ C)	810	1,070	1,250
7	Van Wyck Expwy to Terminals 8 and 9	680 (≥ C)	740 (≥ C)	870 (≥ C)	1,170	1,550	1,900
8	Van Wyck Expwy to Terminal 4	590 (≥ C)	680 (≥ C)	860 (≥ C)	2,340	3,100	3,800
OUTBOUND FROM CENTRAL TERMINAL AREA							
9	Van Wyck Expwy (on-airport)	1,530 (≥ C)	2,340 (≥ C)	2,710 (≥ C)	3,900	5,130	6,000
10	JFK Expwy	1,760 (≥ C)	2,460 (≥ C)	2,850 (≥ C)	3,900	5,130	6,000
11	Terminals 1-7 to Van Wyck Expwy (Main)	1,180 (≥ C)	1,700 (≥ C)	1,960 (≥ C)	3,900	5,130	6,000
12	Terminals 1-3 and Blue Parking to Van Wyck Expwy via Loop Ramp	620 (≥ C)	1,110 (≥ C)	1,270 (≥ C)	1,620	2,140	2,500
13	Terminals 1-6, 8 and 9 to JFK Expwy	1,190 (≥ C)	1,880 (≥ C)	2,170 (≥ C)	2,600	3,420	4,000
14	Terminals 8 and 9 to Van Wyck Expwy	370 (≥ C)	610 (≥ C)	720 (≥ C)	1,170	1,550	1,900
15	Terminals 8 and 9 to JFK Expwy	790 (≥ C)	830 (≥ C)	980 (≥ C)	1,170	1,550	1,900
16	Terminals 4-6 to Van Wyck Expwy	680 (≥ C)	1,090 (≥ C)	1,260 (D)	1,170	1,550	1,900
17	Terminals 4-6 to JFK Expwy	460 (≥ C)	880 (≥ C)	1,010 (≥ C)	1,170	1,550	1,900
18	Terminal 7 to Van Wyck Expwy	290 (≥ C)	270 (≥ C)	320 (≥ C)	1,170	1,550	1,900

Notes:

1. Terminals 1-3 include Green Parking; Terminal 4 includes Blue Parking; Terminals 5&6 include Yellow Parking; Terminal 7 includes Orange Parking; Terminals 8&9 include Red Parking
2. (≥ C) = Level of Service A, B or C, (D) = Level of Service D, (E) = Level of Service E, (F) = Level of Service F

Table II.4-1 (continued)
JFK On-Airport Critical Roadway Segments (AM)

	AIRPORT ROADWAY DESCRIPTION	Base Year 2004 AM Peak Traffic (Vehicles/Hour)	Forecast 2015 AM Peak Traffic (Vehicles/Hour)	Forecast 2025 AM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
AIRPORT ENTRANCES							
19	Ramp from Van Wyck Expwy (off-airport)	3,380 (D)	4,190 (F)	4,850 (F)	2,600	3,420	4,000
20	Ramp from Nassau Expwy E/B	1,110 (≥ C)	1,380 (D)	1,590 (E)	1,170	1,550	1,900
21	Van Wyck Expwy (on-airport)	4,490 (≥ C)	5,570 (E)	6,440 (F)	4,500	5,340	6,000
22	Ramp from Belt Pkwy W/B	1,650 (≥ C)	2,120 (≥ C)	2,460 (≥ C)	2,600	3,420	4,000
23	Ramp from Nassau Expwy E/B	500 (≥ C)	640 (≥ C)	750 (≥ C)	1,170	1,550	1,900
24	JFK Expwy	2,150 (≥ C)	2,760 (≥ C)	3,210 (≥ C)	3,900	5,130	6,000
AIRPORT EXITS							
25	Van Wyck Expwy (on-airport)	2,570 (≥ C)	3,930 (≥ C)	4,550 (D)	4,500	5,340	6,000
26	Ramp to Van Wyck Expwy (off-airport)	2,030 (≥ C)	3,100 (D)	3,600 (D)	2,925	3,875	4,750
27	Ramp to Belt Pkwy E/B	340 (≥ C)	520 (≥ C)	600 (≥ C)	1,300	1,710	2,000
28	Ramp to Nassau Expwy E/B	200 (≥ C)	310 (≥ C)	350 (≥ C)	1,170	1,550	1,900
29	JFK Expwy	1,740 (≥ C)	2,430 (≥ C)	2,820 (≥ C)	3,900	5,130	6,000
30	Ramp to Belt Pkwy E/B	530 (≥ C)	740 (≥ C)	860 (≥ C)	2,600	3,420	4,000
31	Ramp to N. Conduit Ave. and Nassau Expwy E/B	1,210 (D)	1,690 (E)	1,960 (F)	1,170	1,550	1,900
CTA RAMPS FROM TERMINALS 4/5/6							
32	Terminals 5 and 6 to JFK Expwy	410 (≥ C)	740 (≥ C)	790 (≥ C)	1,170	1,550	1,900
33	Terminals 5 and 6 to Van Wyck Expwy	560 (≥ C)	920 (≥ C)	980 (≥ C)	2,340	3,100	3,800
34	Terminal 4 to JFK Expwy	220 (≥ C)	330 (≥ C)	420 (≥ C)	1,170	1,550	1,900
35	Terminal 4 to Van Wyck Expwy	320 (≥ C)	390 (≥ C)	490 (≥ C)	2,340	3,100	3,800

Notes:

1. Terminals 1-3 include Green Parking; Terminal 4 includes Blue Parking; Terminals 5&6 include Yellow Parking; Terminal 7 includes Orange Parking; Terminals 8&9 include Red Parking

2. (≥ C) = Level of Service A, B or C, (D) = Level of Service D, (E) = Level of Service E, (F) = Level of Service F

Table II.4-2
JFK On-Airport Critical Roadway Segments (PM)

	AIRPORT ROADWAY DESCRIPTION	Base Year 2004 PM Peak Traffic (Vehicles/Hour)	Forecast 2015 PM Peak Traffic (Vehicles/Hour)	Forecast 2025 PM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
INBOUND TO CENTRAL TERMINAL AREA							
1	Van Wyck Expwy (on-airport)	3,560 (≥ C)	4,220 (D)	4,890 (D)	3,900	5,130	6,000
2	JFK Expwy	2,160 (≥ C)	2,490 (≥ C)	2,880 (≥ C)	3,900	5,130	6,000
3	Van Wyck Expwy to Terminals 5-9 and Blue Parking	1,980 (≥ C)	2,510 (D)	2,830 (D)	2,340	3,100	3,800
4	JFK Expwy to Terminals 1-3, 5-7 and Blue Parking	1,320 (≥ C)	1,510 (≥ C)	1,680 (≥ C)	2,150	2,850	3,500
5	Van Wyck Expwy and JFK Expwy to Terminals 5-7 and Blue Parking	1,830 (≥ C)	2,400 (≥ C)	2,630 (≥ C)	2,925	3,875	4,750
6	JFK Expwy to Terminals 5-7 and Blue Parking via Loop Ramp	660 (≥ C)	670 (≥ C)	740 (≥ C)	810	1,070	1,250
7	Van Wyck Expwy to Terminals 8 and 9	830 (≥ C)	1,020 (≥ C)	1,200 (D)	1,170	1,550	1,900
8	Van Wyck Expwy to Terminal 4	570 (≥ C)	780 (≥ C)	990 (≥ C)	2,340	3,100	3,800
OUTBOUND FROM CENTRAL TERMINAL AREA							
9	Van Wyck Expwy (on-airport)	3,060 (≥ C)	3,470 (≥ C)	4,020 (D)	3,900	5,130	6,000
10	JFK Expwy	3,010 (≥ C)	3,410 (≥ C)	3,950 (D)	3,900	5,130	6,000
11	Terminals 1-7 to Van Wyck Expwy (Main)	2,570 (≥ C)	2,770 (≥ C)	3,190 (≥ C)	3,900	5,130	6,000
12	Terminals 1-3 and Blue Parking to Van Wyck Expwy via Loop Ramp	1,640 (D)	1,850 (D)	2,120 (D)	1,620	2,140	2,500
13	Terminals 1-6, 8 and 9 to JFK Expwy	2,130 (≥ C)	2,540 (≥ C)	2,940 (D)	2,600	3,420	4,000
14	Terminals 8 and 9 to Van Wyck Expwy	540 (≥ C)	590 (≥ C)	690 (≥ C)	1,170	1,550	1,900
15	Terminals 8 and 9 to JFK Expwy	1,140 (≥ C)	1,290 (D)	1,520 (D)	1,170	1,550	1,900
16	Terminals 4-6 to Van Wyck Expwy	660 (≥ C)	950 (≥ C)	1,090 (≥ C)	1,170	1,550	1,900
17	Terminals 4-6 to JFK Expwy	540 (≥ C)	810 (≥ C)	930 (≥ C)	1,170	1,550	1,900
18	Terminal 7 to Van Wyck Expwy	480 (≥ C)	450 (≥ C)	530 (≥ C)	1,170	1,550	1,900

Notes:

1. Terminals 1-3 include Green Parking; Terminal 4 includes Blue Parking; Terminals 5&6 include Yellow Parking; Terminal 7 includes Orange Parking; Terminals 8&9 include Red Parking

2. (≥ C) = Level of Service A, B or C, (D) = Level of Service D, (E) = Level of Service E, (F) = Level of Service F

Table II.4-2 (continued)
JFK On-Airport Critical Roadway Segments (PM)

AIRPORT ROADWAY DESCRIPTION		Base Year 2004 PM Peak Traffic (Vehicles/Hour)	Forecast 2015 PM Peak Traffic (Vehicles/Hour)	Forecast 2025 PM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
OFF-AIRPORT ENTRANCES							
19	Ramp from Van Wyck Expwy (off-airport)	4,270 (F)	5,060 (F)	5,870 (F)	2,600	3,420	4,000
20	Ramp from Nassau Expwy E/B	1,640 (E)	1,940 (F)	2,250 (F)	1,170	1,550	1,900
21	Van Wyck Expwy (on-airport)	5,910 (E)	7,000 (F)	8,120 (F)	4,500	5,340	6,000
22	Ramp from Belt Pkwy W/B	1,560 (≥ C)	1,800 (≥ C)	2,080 (≥ C)	2,600	3,420	4,000
23	Ramp from Nassau Expwy E/B	370 (≥ C)	430 (≥ C)	490 (≥ C)	1,170	1,550	1,900
24	JFK Expwy	1,930 (≥ C)	2,230 (≥ C)	2,570 (≥ C)	3,900	5,130	6,000
OFF-AIRPORT EXITS							
25	Van Wyck Expwy (on-airport)	4,600 (D)	5,220 (D)	6,040 (F)	4,500	5,340	6,000
26	Ramp to Van Wyck Expwy (off-airport)	3,420 (≥ C)	3,880 (D)	4,490 (D)	3,510	4,650	5,700
27	Ramp to Belt Pkwy E/B	910 (≥ C)	1,030 (≥ C)	1,200 (≥ C)	1,300	1,710	2,000
28	Ramp to Nassau Expwy E/B	270 (≥ C)	310 (≥ C)	350 (≥ C)	1,170	1,550	1,900
29	JFK Expwy	3,600 (≥ C)	4,070 (D)	4,720 (D)	3,900	5,130	6,000
30	Ramp to Belt Pkwy E/B	1,230 (≥ C)	1,390 (≥ C)	1,610 (≥ C)	2,600	3,420	4,000
31	Ramp to N. Conduit Ave. and Nassau Expwy E/B	2,370 (F)	2,680 (F)	3,110 (F)	1,170	1,550	1,900
CTA RAMPS FROM TERMINALS 4/5/6							
32	Terminals 5 and 6 to JFK Expwy	420 (≥ C)	650 (≥ C)	700 (≥ C)	1,170	1,550	1,900
33	Terminals 5 and 6 to Van Wyck Expwy	480 (≥ C)	760 (≥ C)	810 (≥ C)	2,340	3,100	3,800
34	Terminal 4 to JFK Expwy	550 (≥ C)	560 (≥ C)	710 (≥ C)	1,170	1,550	1,900
35	Terminal 4 to Van Wyck Expwy	620 (≥ C)	630 (≥ C)	800 (≥ C)	2,340	3,100	3,800

Notes:

1. Terminals 1-3 include Green Parking; Terminal 4 includes Blue Parking; Terminals 5&6 include Yellow Parking; Terminal 7 includes Orange Parking; Terminals 8&9 include Red Parking
2. (≥ C) = Level of Service A, B or C, (D) = Level of Service D, (E) = Level of Service E, (F) = Level of Service F

Under projected 2015 AM peak hour traffic demand conditions, all critical roadway segments within the CTA are anticipated to remain at LOC C or better. However, several critical roadway segments within the CTA are indicated to deteriorate from LOS C or better to LOS D during the PM peak hour. This includes the two main inbound segments from the Van Wyck Expressway (Segments 1 and 3) as well as the outbound segments to the VWE from Terminals 1-3 plus Blue parking (Segment 12 and the exit from Terminals 8/9 to JFK Expressway, Segment 15). On the critical roadway segments outside the CTA, projected 2015 operations on links leading into the airport from the VWE are projected to deteriorate into LOS D through F (Segments 19, 20 and 21). Exit links to the VWE outside the CTA (Segments 25 and 26) are also projected to deteriorate to LOS D while the ramp to Nassau Expressway will deteriorate to LOS F (Segment 31).

Under projected 2025 traffic demand, several additional critical roadway segments within the CTA will deteriorate to LOS D operations. Two segments will operate at LOS D during the AM peak hour and eight segments during the PM peak hour, or nearly half the segments analyzed. During the PM peak hour, in addition to those segments noted above operating at LOS D under 2015 conditions, the inbound ramp from the VWE to Terminals 8/9 (Segment 7), the outbound segments to both the Van Wyck and JFK Expressways (Segments 9,10) and Terminals 1, 6, 8/9 to JFK Expressway (Segments 13, 15) will also operate at LOS D. On the critical roadway segments at the entrance and exit to the airport, the operational deficiencies noted above under 2015 conditions for Segments 19, 20, 21, 25, 26 and 31 are projected to deteriorate further.

II.4.4 On-Airport Roadways – Conclusions and Recommendations

Based upon the above analysis and findings, following summary recommendations are proposed.

Airport Gateway Links

Operational deficiencies are forecast to occur on the connecting links between the on-airport and off-airport roadway network, especially relative to the Van Wyck Expressway airport gateway. These deficiencies are most critical during the PM peak hour when airport passenger activity is the highest. With regard to these findings, several related issues should be considered. First, the Van Wyck Expressway entrance is significantly over utilized relative to JFK Expressway. The Port Authority has proposed the installation of a variable message sign to encourage diversion of Nassau Expressway eastbound traffic from the Van Wyck to the JFK Expressway entrance. Second, the inbound flow from the VWE is projected to increase by approximately 1600 vehicles per hour over the 2004 to 2025 time frame, an increase of nearly 40%. Although a widening of the Expressway bridge over the Belt Parkway would provide the opportunity to increase inbound airport capacity in the immediate area, the congested conditions on the off-airport VWE would serve to dampen such a significant increase in the hourly levels of inbound traffic to the airport. Likewise, any significant increase in outbound traffic demand is going to further exacerbate congested conditions on the Van Wyck Expressway.

Third, the assumptions made in this analysis include the continuation of the AirTrain mode share at current levels and no new transit service. An increase in AirTrain mode share or new transit services to reduce the mode share by private auto and taxi would contribute to a mitigation of these conditions (See Section II.6).

At the JFK Expressway gateway, the only significant deficiency is the single lane ramp to North Conduit Avenue/Nassau Expressway. Traffic flow on this ramp should be studied further and a widening to two lanes considered.

CTA Roadways

The CTA roadway system overall appears to have adequate capacity to serve 2015 demand levels with four critical segments operating at LOS D during the higher demand PM peak hour. As noted above, deficiencies may occur or grow worse at signal controlled intersections, adversely affecting roadway links near the terminal frontages, but these deficiencies do not reflect significant CTA roadway capacity deficiencies and would be addressed by local modifications. Other minor CTA roadway modifications, such as to ramp termini and lane balance may also be necessary to facilitate specific traffic movements.

At 2025 traffic demand levels, nearly half the critical links analyzed during the PM peak hour are projected to operate within LOS D. While the primary CTA roadway system would remain functional at 2025 demand levels, delays would increase, localized congestion would be common and the CTA roadways would have limited ability to absorb any significant growth above this level.

II.4.5 Terminal Frontage Roadways

Each airline terminal frontage at Kennedy International Airport consist of separate arrivals and departure roadways. The arrivals frontage roadways generally provide “segmented” curb spaces with particular designations for cars, taxis, limousines, buses and shuttle vehicles. The departures frontage roadways generally provide “common” curb spaces where no use restrictions are applied to any vehicles, except for Terminals 2/3, 6 and 7 frontages that allow mixed use vehicles. Temporary frontages are currently provided at two of the CTA terminals, i.e., JetBlue Terminal 6 and American Airlines Terminal 8/9, due to their on-going redevelopment activities. JetBlue Airlines temporarily occupies Terminal 6 while its permanent facility is undergoing construction at Terminal 5. American Airlines’ facilities are also undergoing major consolidation and modernization at Terminal 8/9.

II.4.6 Terminal Frontage Capacity and Operations

Available frontage curb capacity of each CTA terminal was established based upon review of terminal record base plans and actual curb lengths measured during field inventory surveys conducted in May 2006. Summary of existing terminal frontages at Kennedy Airport is shown in Table II.4-3. All of the CTA terminals have as standard one or two arrivals and departures roadways, with the exception of Terminals 2 and 3, which have multiple inner and outer arrivals roadways. Multiple frontages along the lower level of Terminal 2 currently provide complex operations.

For instance, the innermost frontage of inner arrivals roadway nearest the terminal building is closed to passenger cars after 4:20 PM and only taxis are allowed to use the innermost frontage. Although the middle frontage of the inner arrivals roadway is designated as a taxi lane by posted signs, only passenger car activity was observed during the field surveys. Terminal 3 provides curb spaces along both terminal frontages and through the terminal building. As a result, Terminal 3 consists of relatively long arrival and departure frontages. Several terminals also provide double curb loading/unloading lanes, thereby resulting in increased effective frontage capacity at Terminals 3, 4, 6, 7, 8 and 9. As such, the increased effective curb lengths are reflected in Table II.4-3.

Table II.4-3
JFK Airport Frontage Curb Capacity Summary

Frontage Curb	Available Curb (feet)					
	Terminal 1	**Terminal 2/3**	**Terminal 4**	**Terminal 6***	**Terminal 7**	**Terminal 8/9****
Arrivals						
Car/Limo/Car Service	87	639	904	610 (640)	554	1106 (856)
Taxi	296	451	575	96 (220)	351	516 (306)
Shared Ride/Shuttle	---	---	---	---	---	150 (0)
Bus	501	869	890	---	315	447 (370)
Total	**884**	**1959**	**2369**	**706 (860)**	**1220**	**2219 (1532)**
Departures						
Car/Limo/Taxi	613	1160	1698	756 (1040)	281	2190 (1812)
Shared Ride/Shuttle	---	---	---	---	---	---
Bus	---	96	---	118 (0)	351	---
Total	**613**	**1256**	**1698**	**874 (1040)**	**632**	**2190 (1812)**

Notes:
* Numbers in parentheses represent permanent Jetblue frontage curb available in the proposed Terminal 5 redevelopment plan.
** Numbers in parentheses represent permanent American Airlines frontage curb available in the proposed Terminal 8 redevelopment plan.

Future 2015 and 2025 frontage curb capacities of the CTA terminals are expected to be essentially the same as those of the 2004 baseline condition, except for the reconstructed Terminals 5 and 8/9, which reflect the new frontage curb configuration of the proposed redevelopment plans. For the purpose of this study, the car loading/unloading frontage includes passenger cars, private "black car" limousines and car services. The shared ride category includes permittee vehicles such as authorized "black car" limousines, courtesy vans and other off-airport transit van service.

The critical peak hours of frontage use at each CTA terminal were identified from the 2004 and 2015 design day airline schedules. As a result, the peak hours of frontage curb activity for Kennedy Airport terminals varied widely throughout the typical day. Departing passengers generally arrive at the airport a considerable time before their scheduled flight departure time and arriving passengers generally leave the frontage curb within the same hour as their flight arrival time. The start of the frontage curb peak hour for various CTA terminals under the 2004 and 2015/2025 conditions are identified as follows:

	Arrivals		Departures	
Terminal	2004	2015/2025	2004	2015/2025
1	3:30 PM	3:30 PM	3:40 PM	3:10 PM
2/3	4:10 PM	4:10 PM	4:10 PM	4:00 PM
4	3:20 PM	2:40 PM	4:00 PM	4:00 PM
5/6	2:20 PM	7:10 PM	6:40 AM	7:50 AM
7	4:10 PM	7:40 PM	4:00 PM	5:00 PM
8/9	7:30 PM	3:50 PM	6:10 AM	6:10 AM

Comparisons of the available curb frontage capacity and peak hour usage at each CTA terminal revealed the extent of deficiency or surplus under the 2004, 2015 and 2025 passenger demand conditions, as shown in Table II.4-4.

As shown, there is sufficient total frontage capacity on arrivals and departures roadways for all CTA terminals at Kennedy Airport under 2004 baseline, 2015 and 2025 passenger demand conditions. However, a shortage of frontage curb space (i.e., 112 feet to 162 feet) for passenger cars occurs at the Terminal 1 arrivals roadway. In addition, a deficit of curb space (i.e., 140 feet to 220 feet) for limousines and shuttle vans occurs on Terminal 1 arrivals roadway. The Terminal 7 departures roadway also incurs a shortage of curb space (i.e., 19 feet to 68 feet) on the departures roadway. Similarly, a deficit of limo/shuttle van curb space occurs at all other CTA terminals. Thus, a redistribution of available frontage curb supply is necessary to accommodate the actual frontage demand at each terminal.

II.4.7 Terminal Frontage Roadways – Conclusions and Recommendations

Based on the results of foregoing analyses, it is determined that all of the CTA terminals at Kennedy Airport have sufficient total frontage curb capacity to accommodate passenger demand forecast between 2004 and 2025. However, an individual curb space deficit for passenger cars is expected on the Terminal 1 arrivals roadway and Terminal 7 departures roadway. In addition, curb space deficits are indicated for permittee black car limousines and shared ride/transit vans at all of the CTA terminals. The possible redistribution of available frontage curb supply is recommended to mitigate the apparent deficits as follows:

Table II.4-4
JFK Airport Frontage Analysis Summary

Terminal	Frontage Road	Available Frontage (feet) 2004	2015	2025	Required Frontage (80%) (feet) 2004	2015	2025	Theoretical Surplus (Deficit) (feet) 2004	2015	2025
1	Cars/Limos/Car Service	87	87	87	325	325	375	(238)	(238)	(288)
	Taxis	296	296	296	100	100	125	196	196	171
	Shared Ride/Shuttles	0	0	0	120	120	120	(120)	(120)	(120)
	Buses	501	501	501	55	55	55	446	446	446
	Arrivals	**884**	**884**	**884**	**600**	**600**	**675**	**284**	**284**	**209**
	Car/Taxi/Limo/Bus	613	613	613	359	410	513	254	203	100
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures	**613**	**613**	**613**	**359**	**410**	**513**	**254**	**203**	**100**
2/3	Cars/Limos/Car Service	639	639	639	550	575	625	89	64	14
	Taxis	451	451	451	175	175	200	276	276	251
	Shared Ride/Shuttles	0	0	0	120	120	120	(120)	(120)	(120)
	Buses	869	869	869	55	55	55	814	814	814
	Arrivals	**1959**	**1959**	**1959**	**900**	**925**	**1000**	**1059**	**1034**	**959**
	Cars/Taxis	1160	1160	1160	600	700	725	560	460	435
	Shared Ride/Shuttles	0	0	0	120	120	120	(120)	(120)	(120)
	Buses	96	96	96	55	55	55	41	41	41
	Departures	**1256**	**1256**	**1256**	**775**	**875**	**900**	**481**	**381**	**356**
4	Cars/Limos/Car Service	904	904	904	525	525	625	379	379	279
	Taxis	575	575	575	175	175	200	400	400	375
	Shared Ride/Shuttles	0	0	0	120	120	160	(120)	(120)	(160)
	Buses	890	890	890	55	55	55	835	835	835
	Arrivals	**2369**	**2369**	**2369**	**875**	**875**	**1040**	**1494**	**1494**	**1329**
	Car/Taxi/Limo/Bus	1698	1698	1698	462	462	590	1236	1236	1108
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures	**1698**	**1698**	**1698**	**462**	**462**	**590**	**1236**	**1236**	**1108**
5/6	Cars/Limos/Car Service	610	640	640	300	450	500	310	190	140
	Taxis	96	220	220	75	100	100	21	120	120
	Shared Ride/Shuttles	0	0	0	120	160	160	(120)	(160)	(160)
	Buses	0	0	0	55	55	55	(55)	(55)	(55)
	Arrivals	**706**	**860**	**860**	**550**	**765**	**815**	**156**	**95**	**45**
	Cars/Taxis	756	1040	1040	525	825	900	231	215	140
	Shared Ride/Shuttles	0	0	0	120	160	160	(120)	(160)	(160)
	Buses	118	0	0	55	55	55	63	(55)	(55)
	Departures	**874**	**1040**	**1040**	**700**	**1040**	**1115**	**174**	**0**	**(75)**
7	Cars/Limos/Car Service	554	554	554	350	375	450	204	179	104
	Taxis	351	351	351	100	100	100	251	251	251
	Shared Ride/Shuttles	0	0	0	120	120	120	(120)	(120)	(120)
	Buses	315	315	315	55	55	55	260	260	260
	Arrivals	**1220**	**1220**	**1220**	**625**	**650**	**725**	**595**	**570**	**495**
	Cars/Taxis	281	281	281	425	450	550	(144)	(169)	(269)
	Shared Ride/Shuttles	0	0	0	80	80	120	(80)	(80)	(120)
	Buses	351	351	351	55	55	55	296	296	296
	Departures	**632**	**632**	**632**	**560**	**585**	**725**	**72**	**47**	**(93)**
8/9	Cars/Limos/Car Service	1106	856	856	750	775	850	356	81	6
	Taxis	516	306	306	100	100	100	416	206	206
	Shared Ride/Shuttles	150	0	0	160	160	160	(10)	(160)	(160)
	Buses	447	370	370	55	55	55	392	315	315
	Arrivals	**2219**	**1532**	**1532**	**1065**	**1090**	**1165**	**1154**	**442**	**367**
	Car/Taxi/Limo/Bus	1174	798	798	564	590	667	610	208	131
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures (Inner)	**1174**	**798**	**798**	**564**	**590**	**667**	**610**	**208**	**131**
	Car/Taxi/Limo/Bus	1016	1014	1014	0	0	0	1016	1014	1014
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures (Outer)	**1016**	**1014**	**1014**	**0**	**0**	**0**	**1016**	**1014**	**1014**

Note: The deficits indicated are theoretical only. The large deficits indicated are physically unattainable. Operational considerations must be studied to rectify the frontage shortages.

- At Terminal 1, the existing taxi lane on the inner arrivals roadway with an existing curb length of 296 feet should be converted to passenger car loading/unloading space, resulting in an increased car curb length from 87 feet to 383 feet. The existing bus stop space length of 156 feet located on the east side of outer arrivals roadway should be designated for permittee shared ride/shuttle service.

- At Terminal 2, the existing bus stop space length of 156 feet on the outer arrivals roadway should be considered for designation as curb space for authorized shared ride/shuttle service.

- At Terminal 3, the existing 120 feet of car loading/unloading space on the upper level departures roadway inside the Terminal 3 building should be designated for permittee shared ride/shuttle service.

- At Terminal 4, the existing reserved parking space length of 261 feet located in the vicinity of the westerly VIP parking lot should be designated for permittee shared ride/shuttle service.

- For the proposed JetBlue Terminal 5, approximately 160 feet of car loading/unloading space on the arrivals roadway may be assigned to permittee shared ride/shuttle van space and the taxi lane length should be reduced from 220 feet to 165 feet for provision of a 55-foot bus stop.

- At Terminal 7, the existing bus stop length of 224 feet should be reduced to 104 feet on the inner arrivals roadway in order to provide a permittee shared ride/shuttle space. In addition, the existing bus stop length of 351 feet on the inner departures roadway needs to be reduced to 55 feet for the provision of a common frontage space for cars, taxis, limos and shuttle van service. For 2025 traffic conditions, however, a curb space deficiency of nearly 100 feet is expected on the departures frontage during the peak period.

- For the proposed American Airlines Terminal 8, approximately 50% of the currently reserved NO STOPPING ANYTIME curb space length of 396 feet on the outer Recirculation Road should be designated for permittee shared ride/shuttle van service.

II.5 On-Airport Vehicle Parking Capacity

II.5.1 On-Airport Vehicle Parking Facilities

An inventory of existing short- and long-term parking facilities at John F. Kennedy International Airport was obtained from the on-airport parking supply database. For the purpose of this study, the actual public parking capacity based on current operating conditions is considered to represent the baseline condition. The on-airport parking evaluation is directed towards the public parking needs of airline passengers and airport employees. The assessment of tenant parking at the various individual properties is not addressed in this study. Public parking is primarily intended for airline passengers and their meeters-greeters and is classified as long-term (longer than 24 hours) and daily (24 hours or less) spaces. Locations of the existing on-airport CTA parking facilities are shown on Exhibit II.5-1. A total supply of 16,963 parking spaces was identified at eleven parking facilities located throughout Kennedy Airport environs (see Table II.5-1).

Exhibit II.5-1
JFK – Parking Facilities

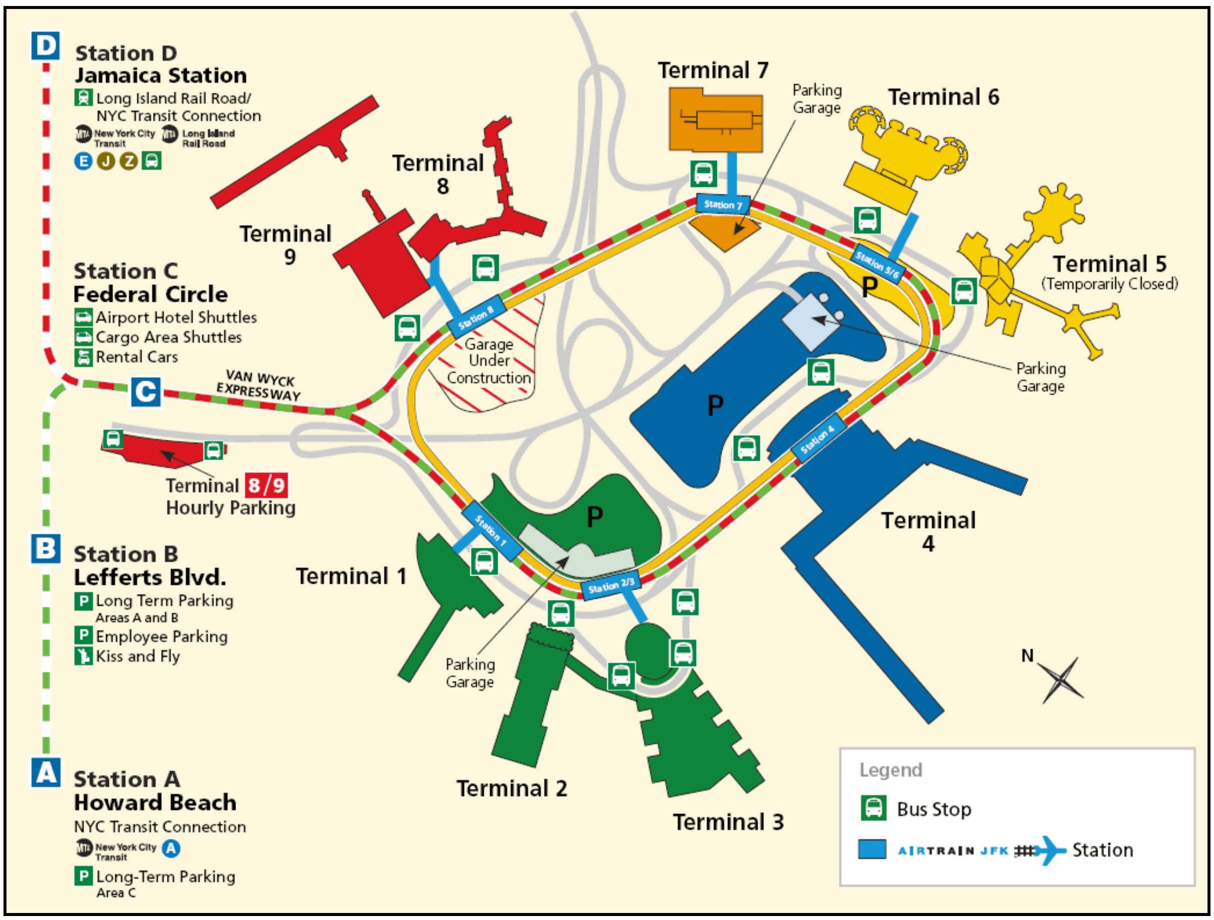


Table II.5-1
JFK Airport Parking Summary

Parking Lot	Parking Color	Terminal	Supply 2004	Supply 2015	Supply 2025	Parking Occupancy 2004	Parking Occupancy 2015	Parking Occupancy 2025	Surplus (Deficit) 2004	Surplus (Deficit) 2015	Surplus (Deficit) 2025
1	Green	Terminals 1 and 2/3	1,617	1,617	1,617	1,180	1,478	1,655	437	139	(38)
2	Blue	Terminal 4	2,121	2,121	2,121	1,315	1,778	2,246	806	343	(125)
3	Red	Terminals 8/9 (American Airlines)	---	1,940	1,940	Closed	576	677	---	1,364	1,263
4	Yellow	Terminal 5 (closed), Terminal 6	450	1,500	1,500	450	797	853	0	703	647
5	Orange	Terminal 7 Garage	723	723	723	484	549	642	239	174	81
		SUB-TOTAL (CTA)	**4,911**	**7,901**	**7,901**	**3,429**	**5,178**	**6,073**	**1,482**	**2,723**	**1,828**
7		Long-Term Parking Overflow 1	1,460	1,460	1,460	0	0	0	1,460	1,460	1,460
7A		Long-Term Parking Overflow 2	435	435	435	0	0	0	435	435	435
7B	Bldg. 208	Long-Term Parking Overflow 3	900	---	---	0	0	0	900	---	---
9		Long-Term Parking	6,561	6,561	6,561	4,761	6,435	7,356	1,800	126	(795)
-	Hangar 12	Terminals 8/9 Temporary Hourly	994	---	---	487	---	---	507	---	---
		SUB-TOTAL	**10,350**	**8,456**	**8,456**	**5,248**	**6,435**	**7,356**	**5,102**	**2,021**	**1,100**
8		Employee Parking	1,702	1,702	1,702	1,617	2,185	2,498	85	(483)	(796)
		TOTAL (JFK)	**16,963**	**18,059**	**18,059**	**10,294**	**13,798**	**15,927**	**6,669**	**4,261**	**2,132**

Parking Lots 1 through 5 located in the CTA and the Hangar 12 facility have a total capacity of 5,905 spaces and accommodate the short-term parking needs of adjacent Terminals 1 through 9. The former Lot 6, which was located on the roof of Terminal 3 building, is closed to public parking due to the imposed FAA security requirement of 300-foot clearance from the airfield property line. JetBlue operations at Terminal 6 are expected to end by 2010 with a new JetBlue Terminal 5 completed behind the historic Saarinen Building. A 1,500-space parking garage in the Yellow area is expected to be occupied in 2008. Due to on-going Terminal 8/9 redevelopment activities, the existing Red parking Lot 3 with a design capacity of 950 spaces is currently closed to public parking during the on-site construction of a new 1,940-space parking garage, expected to be completed by the end of 2008. Since April 2005, the short-term parking needs of Terminal 8/9 have been met by the Hangar 12 parking area located on the south side of Van Wyck Expressway outside the CTA. Free shuttle buses transfer American Airlines passengers to Terminal 8/9 from the Hangar 12 parking facility.

The long-term public parking needs at Kennedy Airport are primarily accommodated at Lot 9, which is located approximately 4 miles from the CTA in the southwest quadrant of the Nassau Expressway and Lefferts Boulevard intersection. In addition, there are several off-airport private parking facilities with a total capacity of nearly 1,800 long-term parking spaces and these facilities provide complimentary on-demand shuttle service to the CTA terminals. The long-term parkers in Lot 9 have access to the CTA airline terminals via the AirTrain. Whenever Lot 9 fills within 50 spaces of its capacity, the long-term parkers are diverted to "overflow" parking lots in the sequence of Lot 7, Lot 7A, Hangar 12 and Lot 7B (Building 208). As parking spaces become available again in Lot 9, the long-term parkers are diverted back to Lot 9. Since Building 208 is currently scheduled to be demolished and rebuilt, it will not be used for overflow parking in 2015 and 2025 forecast years. Employee parking is currently provided in Lot 8, which is located in the southeast quadrant of the Nassau Expressway and Lefferts Boulevard intersection.

As identified in the 2005 Parking Demand Study for Kennedy International Airport, the future supply of public long-term and employee parking at Kennedy Airport would depend upon the completion of several major construction projects. The planned major construction projects included: Lot 7 expansion, Lot 7B conversion, Lot 8 conversion, Lot 9 expansion, and Hangar 12 short-term parking. Brief descriptions of these potential projects are as follows:

- Lot 7 at Hangar 17 was considered for expansion to provide an additional 600 spaces for long-term overflow parkers by the 2010 horizon year. However, by 2015, both Lots 7 and 7A at Hangar 17 may be reverted back to tenant parking and these lots would no longer be used for overflow parking.

- Lot 7B at Building 208 was considered for a conversion from overflow parking lot to a multi-tenant parking facility, thereby resulting in a loss of 575 long-term overflow spaces.

- The Hangar 12 parking lot with a total supply of 994 spaces is no longer being used for long-term overflow parking. This overflow lot is currently being used for short-term parkers of American Airlines patrons during the closure of the Red Lot for the construction of the Red Parking Garage. Future plans include the conversion of Hangar 12 lot into a de-icing facility or tenant parking facility by the 2015 horizon year.

- Lot 8 was considered for conversion from employee parking to long-term parking spaces, for a total loss of 1,702 employee spaces.

- Two adjacent vacant parcels at Lot 9 were considered for future expansion to provide an additional 834 spaces for long-term parkers.

- The Aqueduct Race Track site was considered for the potential development of approximately 2,900 off-airport parking spaces for either employee or long-term parking. The Aqueduct site is located approximately 4 miles from the CTA and 0.5-mile from long-term Lot 9. The 23-acre Aqueduct parcel is within the Port Authority's leasehold of Kennedy Airport and this parcel is limited to use for parking only.

It is generally acknowledged that the long-term parking demand at the Kennedy Airport has decreased significantly subsequent to the increased parking rate from $10 per day to $15 in 2005 and also due to the success of AirTrain. In view of the uncertainties in the implementation of these construction projects, the potential loss or gain in parking spaces associated with these projects is not reflected in this study.

II.5.2 On-Airport Parking Capacity and Operations

Parking occupancy data for all on-airport parking facilities were compiled by Five Star Parking in August 2005 and March 2006. As a conservative analysis, the higher parking occupancy data from either month was used to represent the current baseline design-hour parking demand at Kennedy Airport, as summarized in Table II.5-1. On an airport-wide basis, there is a sufficient supply of public parking spaces throughout the 2004 and 2015 design years. The increased passenger demand in 2025 would result in parking shortfalls at CTA Lots 1 and 2 and long-term Lot 9. A deficiency exists in Employee Lot 8, which was at 95% capacity on average day in August 2005 and will not be able to meet demand in the 2015 and 2025 years, indicating deficits of almost 500 and 800 spaces, respectively.

A slight deficit of 38 and 125 spaces is projected for the CTA Green and Blue lots, respectively, in 2025. The Yellow Parking Lot, which presently serves Terminal 6 (JetBlue), is at capacity. Once the Yellow garage is built, the analysis indicates a surplus of nearly 650 spaces in 2025. However, this analysis was based on "constrained" demand where the overflow of parkers from one facility to another nearby facility cannot be clearly quantified. Thus the actual parking surplus may be less than those spaces indicated in Table II.5-1.

For 2025, CTA lots 1 through 5 as a whole indicate a surplus of 1,828 parking spaces. Long-term parking supply indicates a deficiency of 795 spaces in 2025. Employee parking at Lot 8 is expected to incur a shortage of from approximately 500 to 800 spaces between 2015 and 2025. As part of the Aqueduct Race Track parking development, however, one of the planning concepts involved the development of Aqueduct site as an airport employee parking lot. Existing employee Lot 8 would be converted to long-term parking spaces and two adjacent parcels adjacent to Lot 9 would be developed for long-term spaces.

II.6 Analysis of Airport Access/Off-Airport Roadway Capacity

II.6.1 Introduction

Roadway access to John F. Kennedy International Airport is often considered the most challenging of the three major Port Authority Airports. This is in large part due to Kennedy Airport's location in the southeastern corner of New York City's Borough of Queens as well as the limitations imposed by the chronically congested conditions on its two primary access roadways- the Van Wyck Expressway and Belt Parkway. Given the problems associated with roadway access to Kennedy Airport, the Port Authority recognized that rail access was the only means by which reliable airport access could be maintained and embarked upon the development of the AirTrain JFK project, on which service was initiated in late 2003. In addition to possible Kennedy Airport access options by taxi, private and shared limousine, access is also possible by an array of bus services, as described below.

II.6.2 Roadway Access

As noted above, the primary access corridors to Kennedy Airport are the Van Wyck Expressway (I-678) and Belt Parkway. The six-lane Van Wyck Expressway extends north-south and connects with the Long Island Expressway (I-495), Whitestone Expressway and Bronx-Whitestone Bridge leading to the Borough of the Bronx and the Bruckner (I-278) and Cross Bronx/New England Expressways (I-95). This is the primary route for trucks into and out of Kennedy Airport. Significant to the air freight operations at Kennedy is that the traffic rules of New York City limit the total length of combination trucks to 55 feet, including on the Van Wyck Expressway, with only certain excepted roadways in the City. A permit is required to operate longer combination vehicles, which are now common in the trucking industry.

The six-lane Belt Parkway is an east-west roadway (no commercial traffic permitted) leading to the Borough of Brooklyn, the Verrazano-Narrows Bridge and the Borough of Staten Island to the west and to the Southern State Parkway and southern Long Island to the east. Alternate routes, especially for truck access, include the complex east-west arterial roadway network of North and South Conduit Avenue (NYS Route 27) and the recently constructed Nassau Expressway, which connect with Woodhaven Boulevard to the west, thus providing an alternate arterial north-south route to the Van Wyck Expressway. Generally, the preferred route to and from Kennedy Airport for all but intra-Queens trips is via the limited access highway system, but arterial routes are sometimes used as an alternate to avoid the traffic congestion on the Van Wyck Expressway and Belt Parkway.

As noted in Section I-6, congested conditions on the limited access highways in the area are generally caused by bottlenecks, either physical such as at major interchanges or by oversaturated segments that propagate congestion upstream. On the Van Wyck Expressway, its interchange with the Grand Central Parkway to the north (Kew Gardens Interchange) is generally considered a bottleneck for northbound traffic (as well for east/west traffic on the Grand Central Parkway) and traffic entering/exiting the Van Wyck Expressway in the Jamaica area generally adds to congestion levels in both directions. The Belt Parkway/Southern State Parkway is a heavily utilized corridor extending through four counties and subject to frequent bottlenecks within several oversaturated segments along its length.

Annual Average Daily Traffic (AADT) is approximately 160,000 vehicles per day on six lane sections of the Van Wyck Expressway and Belt Parkway in the vicinity of the airport, which illustrates the very high traffic demand levels that these roadways accommodate. Traffic demand is expected to increase over the 20 year planning horizon up to 10 per cent on the Van Wyck Expressway and about half that rate on the Belt Parkway, as forecast by the regional traffic demand forecasting model maintained by the New York Metropolitan Transportation Council. Generally, any increase in traffic demand under the operating conditions of these two roadways would tend to spread the extent of congested operations over a greater time frame rather than raise hourly or short term traffic volumes.

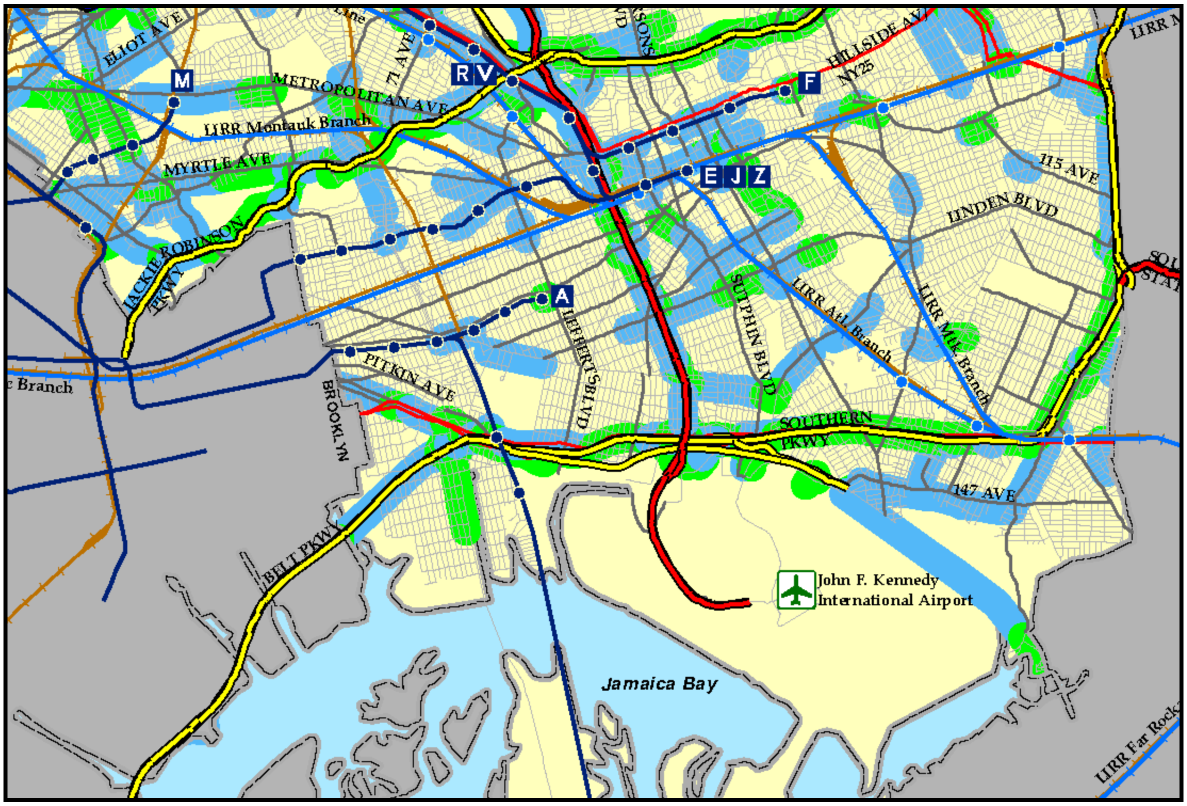
Illustrated on Exhibit II.6-1 is the roadway and transit network in the vicinity of Kennedy Airport. Also shown is the utilization of roadway capacity projected to occur over the AM peak period in the year 2030 by the New York Metropolitan Transportation Council. Most major roadways in the vicinity of the airport are indicated to operate at least over 80 per cent of capacity during the AM peak period with segments or significant portions projected to operate over 100 per cent of capacity, particularly along the Van Wyck Expressway and Belt Parkway. Therefore, the level and duration of congestion on the off-airport roadway network serving Kennedy Airport is expected to be significant in the future during weekday peak traffic periods.

II.6.3 AirTrain JFK

The AirTrain at Kennedy Airport performs a dual-function role in satisfying both off-airport rail access and on-airport circulation. As shown on the system map (Exhibit II.6-2), AirTrain provides an off-airport subway and Long Island Rail Road connection from Jamaica Station and a subway connection from Howard Beach Station. It also provides service between the CTA terminals, the long term parking facility and the car rental center. Transfer between CTA terminals is by a separate loop.

An analysis was performed of AirTrain usage to capacity under 2004 baseline as well as 2015 and 2025 forecast levels. Service capacity was derived based upon current AirTrain operations, assuming approximately 8 minute headways on the Jamaica Line 5-1/2 minute headways on the Howard Beach Line, 2-car consists and 97 passenger per car capacity (conservatively assuming all passengers with luggage). Passenger volumes boarding and alighting at stations and passenger loads between stations were derived as described in Section I.6.2, assuming no change in mode share.

Exhibit II.6-1
JFK - Off-Airport Roadway Operations



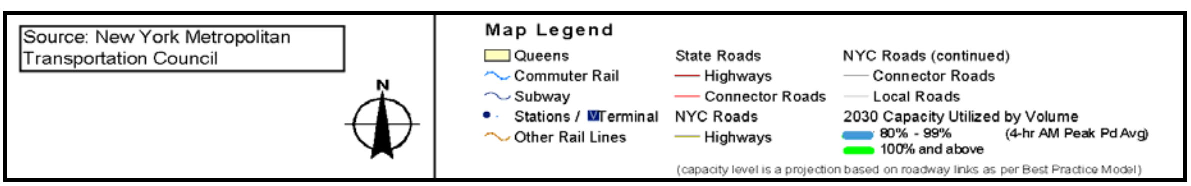


Exhibit II.6-2
JFK - AirTrain System Map

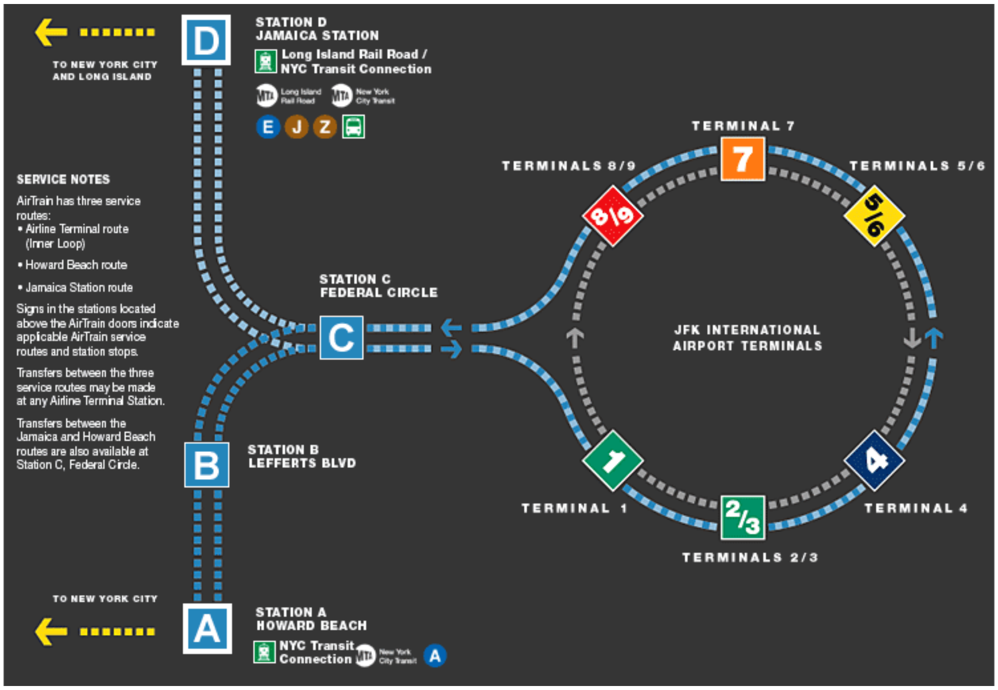


Exhibit II.6-3 provides the passenger loads derived between stations for the 2004, 2015 and 2025 design day peak hour. As shown, the peak load point shifts slightly in comparison between base and forecast years as does the forecast passenger activity at each terminal. The maximum load between stations ranges from 508 passengers per hour (pph) in 2004 to 749 pph in 2025 on the Howard Beach Spur and from 389 pph in 2004 to 572 pph on the Jamaica Spur. Employee trips from Lot 8 were not included in the Howard Beach Spur passenger load estimate. At employee shift change times, usage on the Howard Beach Spur could rise above these levels.

Passenger volume to capacity ratios between stations were also derived using the above passenger loads and service assumptions, as shown on Exhibit II.6-4. In 2025, the maximum passenger volume to capacity ratio is projected to be below 0.40 for both lines. While in the absence of on-board survey information this analysis should be considered approximate, it does indicate that AirTrain capacity will likely be available through the 2025 planning horizon to absorb additional ridership from non-rail modes. Further, system capacity is available to run 4-car consists and shorter headways, thus providing the potential means to absorb significantly greater ridership.

Exhibit II.6-3
JFK - AirTrain Passenger Load Volumes – Howard Beach Spur and Jamaica Spur

JFK AirTrain Passenger Load Volumes
Howard Beach Spur

3:00 PM - 4:00 PM	A → B	B → C	C → 1	1 → 2/3	2/3 → 4	4 → 5/6	5/6 → 7	7 → 8/9	8/9 → C	C → B	B → A
2004 - Base Year	175	296	370	390	421	508	487	484	467	375	221
2015 - Forecast	225	382	475	486	538	582	597	591	649	523	309
2025 - Forecast	258	438	544	558	612	669	686	680	749	603	356

JFK AirTrain Passenger Load Volumes
Jamaica Spur

3:00 PM - 4:00 PM	D → C	C → 1	1 → 2/3	2/3 → 4	4 → 5/6	5/6 → 7	7 → 8/9	8/9 → C	C → D
2004 - Base Year	265	357	370	373	389	322	289	284	210
2015 - Forecast	369	497	452	456	444	410	370	361	268
2025 - Forecast	426	572	519	524	511	467	425	414	306

Exhibit II.6-4
JFK - AirTrain Passenger V/C Ratios – Howard Beach Spur and Jamaica Spur

JFK AirTrain Passenger V/C Ratios Howard Beach Spur																							
2004 - Base Year																							
3:00 PM -		0.08		0.14		0.17		0.18		0.20		0.24		0.23		0.23		0.22		0.17		0.10	
4:00 PM	A	→	B	→	C	→	1	→	2/3	→	4	→	5/6	→	7	→	8/9	→	C	→	B	→	A
2015 - Forecast																							
3:00 PM -		0.10		0.18		0.22		0.23		0.25		0.27		0.28		0.28		0.30		0.24		0.14	
4:00 PM	A	→	B	→	C	→	1	→	2/3	→	4	→	5/6	→	7	→	8/9	→	C	→	B	→	A
2025 - Forecast																							
3:00 PM -		0.12		0.20		0.25		0.26		0.28		0.31		0.32		0.32		0.35		0.28		0.17	
4:00 PM	A	→	B	→	C	→	1	→	2/3	→	4	→	5/6	→	7	→	8/9	→	C	→	B	→	A

JFK AirTrain Passenger V/C Ratios Jamaica Spur																			
2004 - Base Year																			
3:00 PM -		0.18		0.24		0.25		0.25		0.26		0.22		0.20		0.19		0.14	
4:00 PM	D	→	C	→	1	→	2/3	→	4	→	5/6	→	7	→	8/9	→	C	→	D
2015 - Forecast																			
3:00 PM -		0.25		0.33		0.30		0.31		0.30		0.27		0.25		0.24		0.18	
4:00 PM	D	→	C	→	1	→	2/3	→	4	→	5/6	→	7	→	8/9	→	C	→	D
2025 - Forecast																			
3:00 PM -		0.29		0.38		0.35		0.35		0.34		0.31		0.28		0.28		0.21	
4:00 PM	D	→	C	→	1	→	2/3	→	4	→	5/6	→	7	→	8/9	→	C	→	D

II.6.4 Bus Access

Several bus transit options are available for travel to and from Kennedy Airport. Direct service to and from Manhattan is available on the New York Airport Express Bus with stops in Manhattan at the Port Authority Bus Terminal, Grand Central Station and Pennsylvania Station. Service frequency is generally every 15 to 30 minutes. Local transit service is provided to and from Kennedy Airport by the Q3, Q10 and B15 bus lines. These services are very lightly used by Kennedy air passengers. In addition, bus connections at Jamaica and via subway to Howard Beach and Jamaica open the entire City to potential airport access by transit.

Baseline 2004 and future forecast usage of express bus service to Kennedy Airport was compared to service capacity levels. On a daily basis, assuming the mode share derived from the Departing Air Passenger Survey, it was estimated that approximately 80 per cent of the capacity of the airport express bus service is used today. By 2025, bus service would have to be increased a minimum of approximately 30 per cent to maintain existing load levels, assuming no additional mode shift to bus.

II.6.5 Off-Airport Transportation Improvements

Table II.6-1 provides a description and status of off-airport transportation projects in the vicinity of or directly related to Kennedy Airport that are in some stage of study or have been listed as potential projects. Several significant projects are in the conceptual or alternatives study phase that could significantly improve Kennedy Airport access and rail usage from Manhattan. The Lower Manhattan Rail Link is currently under study and would enhance Kennedy Airport Access from Manhattan. Likewise, an extension of AirTrain JFK service on the Long Island Rail Road to Manhattan would provide a significant inducement to increase the rail mode share. Significant improvements are under study at the Kew Gardens Interchange north of Kennedy Airport that, if implemented, could reduce northbound congestion on the Van Wyck Expressway. Consideration has also been given to increase capacity on the Van Wyck Expressway itself.

II.6.6 Conclusions

As discussed above, access to John F. Kennedy International Airport by road is in many ways the most challenging of the three major Port Authority airports. Also, as noted in Section II.4, significant capacity issues are evident at the airport perimeter on the airport gateway links. However, with AirTrain JFK, a convenient and reliable alternative to access by road is available. It would be expected that, with or without further enhancement of rail access, AirTrain mode share will rise due to a worsening of the external and gateway roadway congestion problems forecast to occur at Kennedy Airport over the next 20 years.

Table II.6-1
JFK - Off-Airport Transportation Improvements

Project	Description	Sponsors	Benefits	Status
Kew Gardens Interchange Infrastructure and Operational Improvements	Bridge rehabilitation, safety and possibly capacity improvement alternatives under study	NYSDOT	Certain alternatives may reduce northbound Van Wyck Expressway congestion	2008-2009 construction
Lower Manhattan Rail Link	Rail service from Lower Manhattan To Downtown Brooklyn, Jamaica LIRR, JFK	MTA, PANYNJ, LMDC, NYCEDC	Enhanced rail access to JFK from NYC. Also improved access to Lower Manhattan from Long Island	Funded for planning, alternatives analysis, environmental impact studies, preliminary engineering
Airtrain Cars	Purchase additional cars for Airtrain	PANYNJ	Increase system capacity	Not funded in current capital program
One Seat Ride to Midtown	Extend airtrain service to Manhattan on LIRR	PANYNJ	Improve transit access, attractiveness and use	Not funded in current capital program
Improved Vehicle Access to JFK	Add new lanes to Van Wyck Expressway	PANYNJ, NYC	Reduce highway travel time to airport, improve trip reliability	Not funded in current capital program

III. CAPACITY ASSESSMENT

LaGuardia Airport

III.1 Airfield Capacity

The analysis of runway capacity for LGA was conducted as described in Section I, using the runway queue and delay model. The daily distribution of demand was derived from the forecast. CATER and ASPM databases were examined to determine runway capacity rates, runway configurations and existing (2004) delay levels. CATER data was also examined to determine the maximum lengths of runway queues. These lengths of queues were compared to the physical configuration of the taxiways themselves to determine whether the capacity of the taxiway system to manage departure runway queue delays. The model was calibrated against delay levels for 2004 in the FAA ASPM database. Future delay levels for future demand were derived using the model. Finally, capacity values required to have delays at existing levels were computed to define a level of future runway capacity need.

III.1.1 Future Demand Profiles

Exhibit III.1-1 shows the existing and forecast (2015 and 2025) hourly rate of demand (evaluated 60 minutes ahead every five minutes on a rolling basis). LGA aircraft activity is not expected to grow since the forecast assumes that regulatory limits will continue to limit total aircraft movements to 81 per hour (75 air carrier, 6 GA).

Although the number of aircraft movements is not forecast to grow, as shown in **Table III.1-1**, the composition of the aircraft fleet is expected to change towards larger aircraft. Use of large aircraft increases the passenger handling capacity of the airport without increasing the use of the runway system. However, as the percentage of B-757 and B-767 increases the airspace separation between successive aircraft using a runway increases from 2.5 miles to either 4 miles (B-757) or 5 miles (B-767). The separation change is larger for small prop aircraft (less than 20,000 pounds), 5 miles for a B-757 and 6 miles for a B-767.

The net effect of increasing separations is to decrease runway capacity. This capacity decrease is two percent by 2015 and an additional 0.5 percent by 2025. This equates to a capacity decrease of one arrival and one departure per hour by 2015. Since the capacity decrease and the demand increase were so small for 2025, the 2025 demand case was not modeled. Its delay levels and queue lengths are equivalent to those observed for 2015.

Exhibit III.1-1
LGA - Forecast Rate Of Hourly Demand

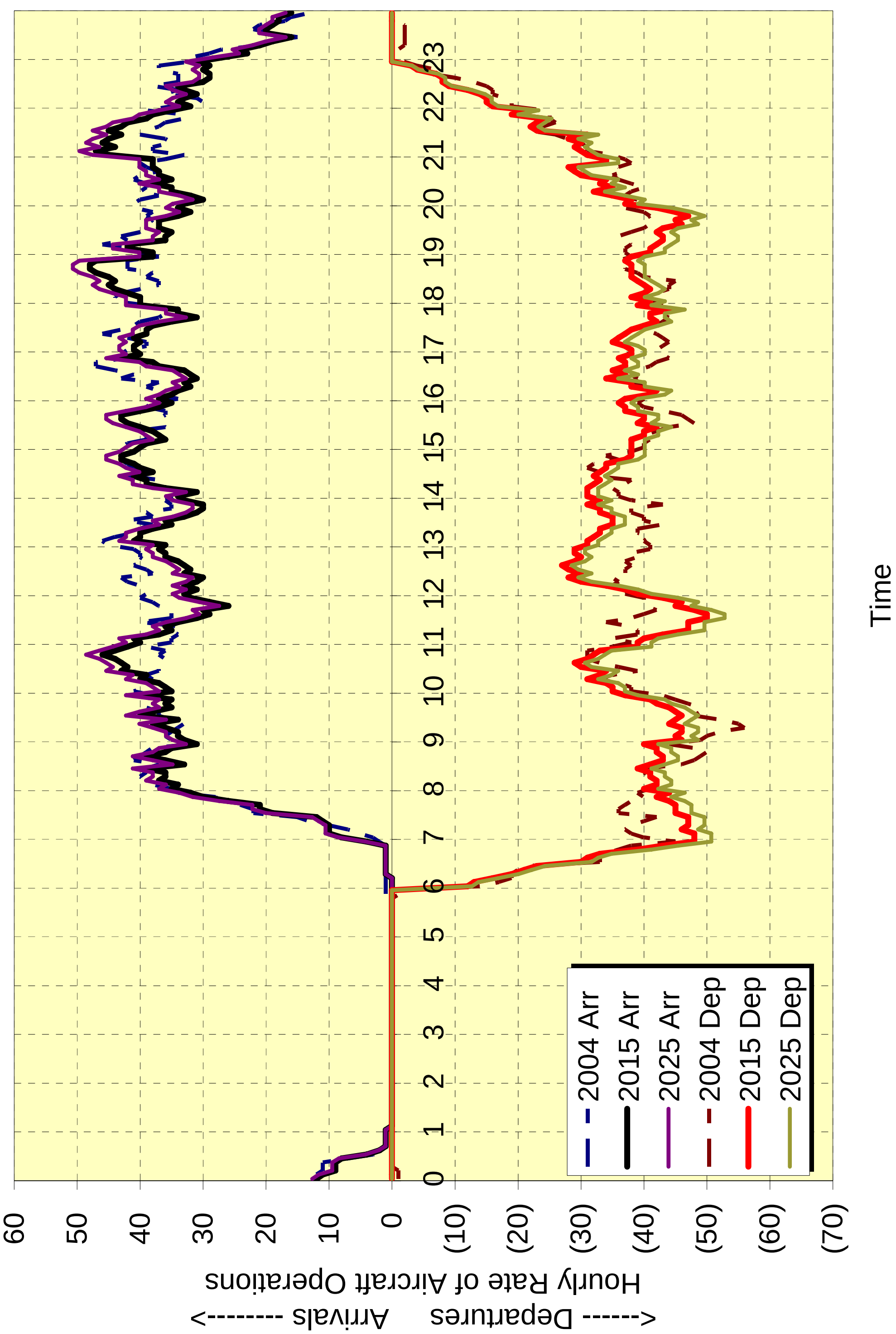


Table III.1-1
LGA Forecast Aircraft Fleet Mix

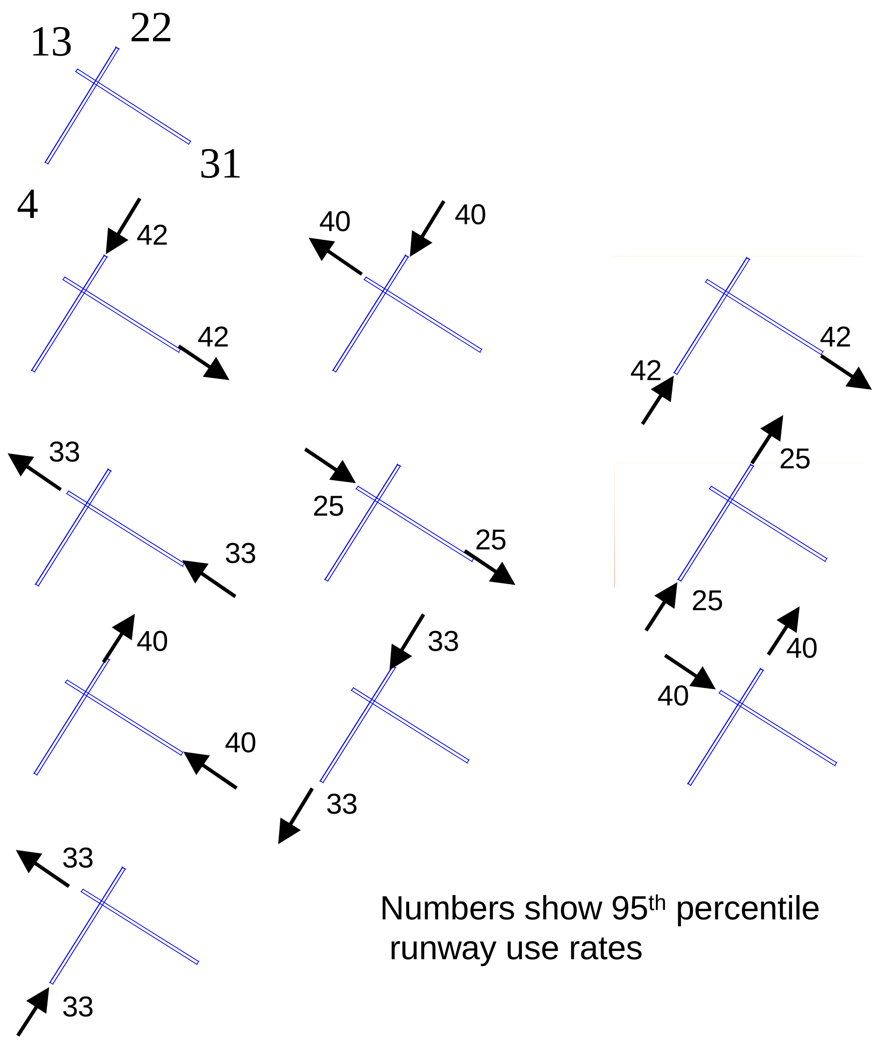
Aircraft Type	% of Total Aircraft Operations				
	2005	2010	2015	2020	2025
Widebody Jet	**1.1%**	**1.1%**	**1.4%**	**1.5%**	**1.5%**
B-757	**6.7%**	**7.7%**	**8.7%**	**9.7%**	**10.7%**
Narrow Body Jet	**45.4%**	**47.8%**	**50.9%**	**51.2%**	**50.6%**
Large Regional Jet	**0.8%**	**6.6%**	**8.4%**	**9.6%**	**11.3%**
Small Regional Jet	**32.8%**	**27.0%**	**22.6%**	**21.0%**	**19.7%**
Turboprop	**13.2%**	**9.7%**	**8.0%**	**7.0%**	**6.3%**
Total Passenger Operations	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

III.1.2 Existing Runway Configurations

Exhibit III.1-3 shows the most frequently used runway configurations used at LGA. Essentially, LGA has four arrival runway flows. In each of these flows, the crossing runway can be used in either direction for departures. The only configurations not used are arriving on Runway 31 and departing on Runway 22, or arriving on Runway 13 and departing on Runway 22. Runway 22 is not used for departures primarily for noise abatement reasons. In addition, other runway configurations provide equivalent capacity. Single runway operations occur 21 percent of the time and occur primarily as a result of weather conditions, or during periods of low demand (late evenings and night). In 2004, the airport generally was closed between 12AM and 6AM from April through October due to construction (7 percent of the time). The annual use of each configuration was established through an examination of CATER data for 2004.

Exhibit III.1-2
LGA Runway Configurations

Runways (A.D)	Observations	Percent of Year	Percent Airport Open
22.13	1,944	22%	24%
4.13	1,498	17%	18%
22.31	1,470	17%	18%
4.31	70	1%	1%
31.04	1,399	16%	17%
13.04	17	0%	0%
13.22	17	0%	0%
31.22	9	0%	0%
31.31	813	9%	10%
13.13	170	2%	2%
22.22	409	5%	5%
4.04	361	4%	4%
-	609	7%	0%
Total	8,784	100%	100%



Numbers show 95th percentile runway use rates

Table III.1-2
LGA - Average Annual Capacity Rates

2004 Demand

	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	36.5	37.8	40	36	36	40
5 Minute	3.0	3.1	3.3	3.0	3.0	3.3
20 Minute	12.2	12.6	13.3	12.0	12.0	13.3

2015 and 2025 Demand

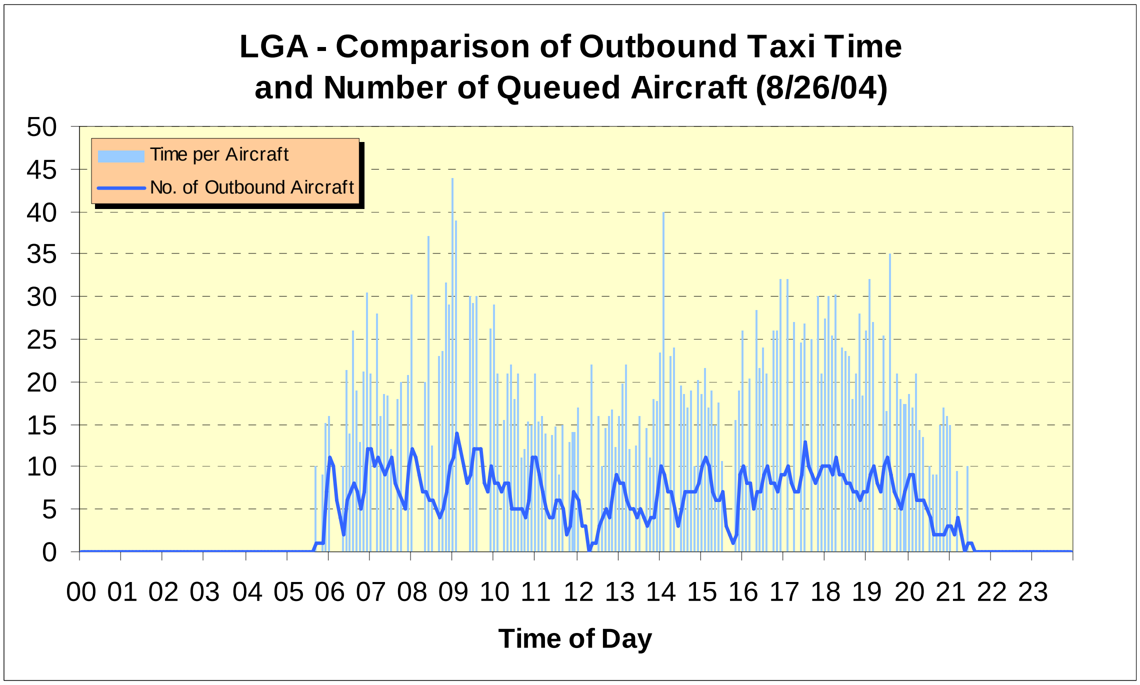
	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	36	37	39	35	35	39
5 Minute	3.0	3.1	3.3	2.9	2.9	3.3
20 Minute	11.9	12.3	13.1	11.8	11.8	13.1

The analysis of CATER and ASPM data determined the average annual runway capacity rates shown in **Table III-2**. The balanced capacity condition reflects use of a single arrival and a single departure runway. The arrival and departure preference modes reflect use of closer separations, which do not always allow for an operation on the intersecting runway between every pair of arrivals or departures. The rates shown reflect an annual average of weather conditions that include both Visual Flight Rules weather, when capacity rates are higher, and IFR weather conditions when capacity rates are lower. The table shows capacity values expressed in three different time intervals. The hourly rate is provided since it is easiest to comprehend. The twenty minute rates are used by the queue model to plan the utilization of airfield capacity while the five minute rates are used for the actual delay calculations. The model operates in a five minute time-slice mode where capacity and delay calculations are updated every five minutes for a twenty-four hour day.

III.1.3 Existing Taxiway Capacity

Exhibit III.1-3 shows the taxi time for each aircraft (bars) and the number of aircraft taxiing between the gate and runway for a typical busy, good weather day in 2004. As shown, the peak number of outbound aircraft was 15 with the peak waiting time averaging about 30 minutes. The LGA airport taxiway system has the ability to handle approximately 20 queued aircraft with another 5 to 10 aircraft taxiing to the queue from various gate areas. Taxi times at LGA tend to be shorter than at EWR or JFK due to the close proximity between the gates and departure runways.

Exhibit III.1-3
LGA - Typical Outbound Taxi Time Analysis



III.1.4 Existing and Future Delay Analyses

Table III.1-2, Exhibits III.1-4 and **III.1-5** show existing and forecast arrival delays for LGA. As shown, existing delay per aircraft levels will increase will increase by approximately 25 percent for arrivals and by 65 percent for departures by 2015, despite an equal number of aircraft operations. Thus, the 2 percent decline in runway capacity that results from the operation of B-757 and other heavy class aircraft produces significant increases in aircraft delays.

Table III.1-3
LGA - Summary Of Existing And Future Aircraft Delays
(In Minutes)

	Arrival Delays			Departure Delays		
	2004	2015	2025	2004	2015	2025
Average	16.3	21.3	21.3	18.9	30.2	30.2
Peak Hour	35.2	50.7	50.7	28.8	46.1	46.1

Exhibit III.1-4
LGA - Existing And Future Arrival Delays

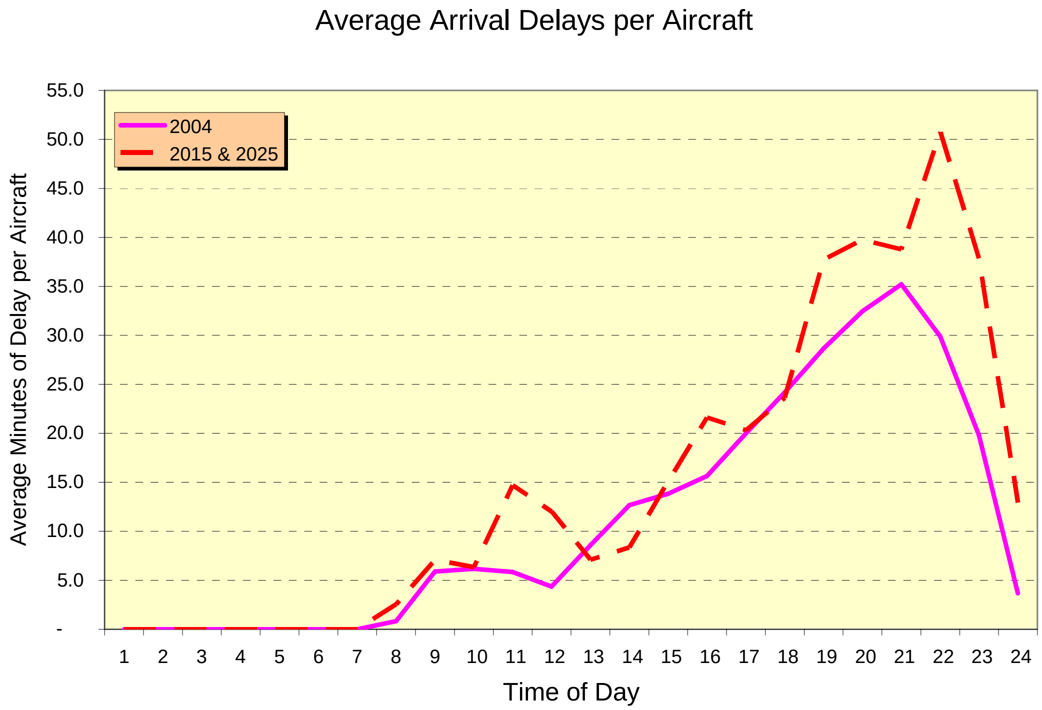
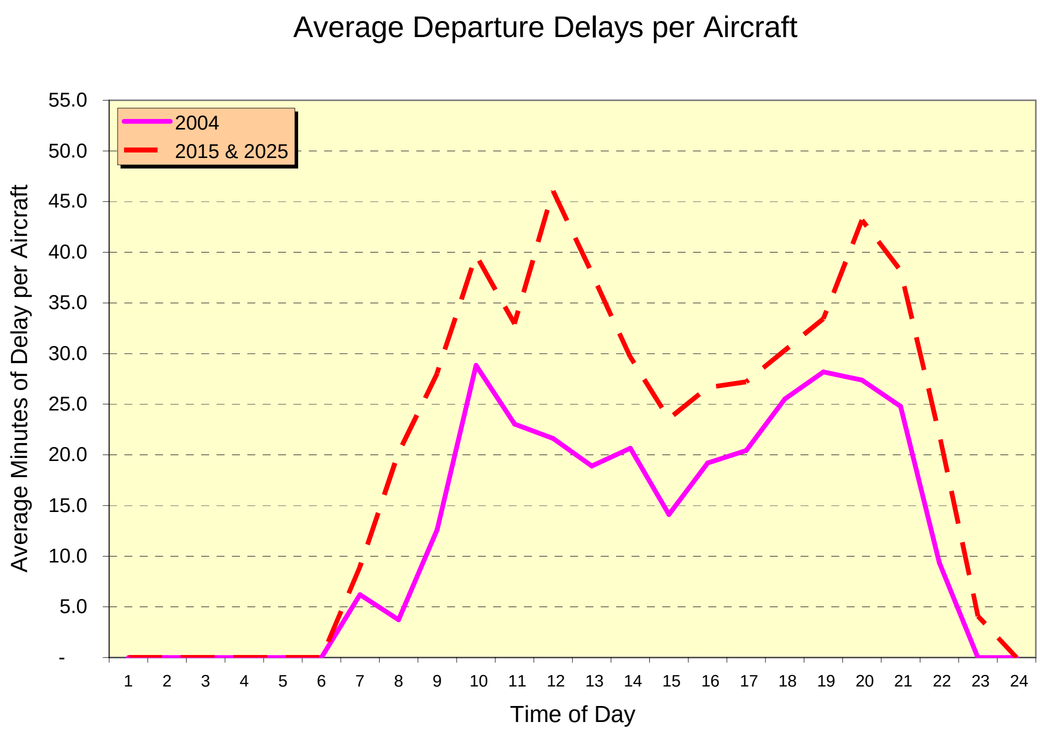


Exhibit III.1-5
LGA - Existing And Future Departure Delays



Existing delay levels computed by the queue model compare favorably to those reported by the FAA ASPM database. The queue model reported 16.3 minutes of arrival delay while the FAA ASPM database recorded an average annual arrival delay of 16.4 minutes. The queue model reported 18.9 minutes of departure delay, while the FAA ASPM database recorded 19.5 minutes.

Most arrival delays will occur in the afternoon and evening. By 2015 peak hour arrival delays will increase by more than 40 percent while peak hour departure delays will increase by more than 60 percent.

More detailed reporting of aircraft delay modeling and queuing needs is presented in Appendix A.

III.1.5 Future Runway and Taxiway Capacity Needs

The queue model was run iteratively to establish the level of runway capacity required to achieve existing delay levels. Runway capacity levels need to stay at existing levels to handle 2015 demand. If current runway capacity levels cannot be maintained, then queuing space for an additional 10 aircraft (for a total of 30 aircraft) needs to be found within the taxiway network. This is equivalent to 2,500 feet of taxiway length or ten hold pad positions. Given the small size of LGA, this may prove challenging. The other option would increase the use of gate holding or hold aircraft in remote gates to manage the flow of departures onto the airfield.

III.2 Gate Utilization

Please refer to Appendix B for gate charts depicting utilization for planning years 2004 & 2015

III.3 Terminal Capacity

This section contains a summary of the major findings of the terminal facilities assessment for LGA. The findings are presented separately for each terminal.

Each terminal's subsection contains exhibits of the 2015 Design Day scheduled seats, and a Terminal Capacity Analysis table. As discussed in Section I.3, the table shows existing and approved facilities; recommended facilities to support current and forecast levels of activity; and any surpluses or deficiencies.

The final subsection contains the annual passenger capacity estimates based on the key facilities identified in Section I.3.3.

In a number of terminals, achieving the full capacity of existing facilities will require: additional investment (not identified explicitly herein); changes in airline leases; and/or changes in operating procedures from exclusive to preferential or common use. (For example, in order to fully utilize the check-in counter capacity in EWR Terminal A, modifications to the outbound baggage systems may be required to allow more flexibility in use. In other terminals, such as the LGA CTB, changes from exclusive to preferential or common use for gates and baggage claim may be necessary to balance utilization across the terminal.) These potential solutions would need to be studied in further detail to determine the optimum approach for addressing each terminal's capacity constraints.

The terminal capacity analysis presented in the tables and exhibits in this section was developed by Hirsh Associates.

III.3.1 Notes on the Terminal Analyses

Terminal-Specific Factors

Many of the planning assumptions and factors used in Section I.3 are common to all of the terminals. Others vary by terminal based on passenger, airline, and/or building characteristics. In order to easily compare the key variable assumptions used for each terminal, Table III.3-1 summarizes these by terminal.

Concessions

Concessions utilization factors were also developed for individual terminals or groups of terminals with similar passenger characteristics. These are presented in Tables III.3-2 through III.3-4. As discussed in Section I.3, these are initial estimates of concession demand potential, and do not factor in the wide range of revenue per square foot achieved by similar concessions in different terminals.

Comparisons of secure vs. non-secure concessions do not include duty free shops which may be located in
either secure or non-secure areas.

Three LGA terminals have small duty free shops to serve the limited number of international flights. These have been combined with news/gift/retail space for this study.

Remote Parking Positions

As noted in Section I.2 (Analysis of Gate Capacity), remote parking positions were estimated only for the 2015 Design Day schedule to provide a guide to over-all airport apron requirements. These are summarized in Table III.3-5.

Airline Space

Terminals vary in terms of offices in proximity to the ATO due to terminal depth, or airline preference for locating administrative functions. When evaluating capacity, ATO offices and other office/operations space have been combined.

Annual Capacity

Annual capacities have been estimated for combined domestic and international annual enplanements using the four key determinants, and for domestic or international enplanements using the secondary determinants. The key determinants are: check-in positions, SSCP lanes; contact gate frontage (NBEG); and holdrooms. Secondary determinants are domestic baggage claim frontage; international primary inspection positions; and international baggage claim frontage. These are summarized in Table III.3-10.

Table III.3-1
LGA - Terminal Specific Variables

	Terminals				
	CTB	DL / NW	DL shuttle	US	
Domestic ATO Counters					
Conventional Staffed Positions	35%	20%	45%	30%	of pass. use staffed counters
	42%	33%	54%	38%	of pk hr pass. enter in peak 30 min.
	1.6	1.6	1.0	1.0	airline exclusivity factor
Self-Service Kiosks	40%	40%	45%	50%	of pass. use kiosks
Ticket Lobby Depth	50	50	40	45	feet
International ATO Counters					
Conventional Staffed Positions	NA	NA	NA	NA	CUTE counters assumed?
	NA	NA	NA	NA	of pass. use staffed counters
	NA	NA	NA	NA	of pk hr pass. enter in peak 30 min.
	NA	NA	NA	NA	airline exclusivity factor
Self-Service Kiosks	NA	NA	NA	NA	of pass. use kiosks
Ticket Lobby Depth	NA	NA	NA	NA	feet
Domestic Baggage Claim					
Claim Frontage Demand	75%	75%	20%	60%	of pass. with checked bags
	50%	50%	67%	62%	of pk hr pass. arrives in pk 20 min.
	2.1	2.2	1.5	1.8	avg. party size
Average Claim Unit Size	170	200	170	170	LF/unit
International Baggage Claim					
Claim Frontage Demand	0%	0%	0%	0%	of pass. with checked bags
	0%	0%	0%	0%	of pk hr pass. arrives in pk 20 min.
	NA	NA	NA	NA	avg. party size
	NA	NA	NA	NA	flight arrival concentration adjust factoı
Average Claim Unit Size	NA	NA	NA	NA	LF/unit
Airline Space					
Airline Operations & Offices (excluding ATO)	2,400	2,800	1,700	2,700	SF/EQA
Make-up capacity (carts or LD3s)	2	2	2	2	/EQA
Baggage Make-up area	600	500	600	600	SF/cart
Checked Bags/pax for EDS screening	1.1	1.1	1.1	1.1	domestic
	1.5	1.5	1.5	1.5	int'l
Airline Clubs & 1st/Bus. Class Lounges	4,362	3,048	0	3,735	SF/million enpl (existing ratio)
Baggage Service Offices	1.5	2.0	1.0	1.5	SF/pk hr dep dom o&d+int'l total pass.
Concessions					
% located in secure area	90%	90%	90%	90%	
Food/Beverage planning factor	4.2	5.1	3.9	5.1	SF/1,000 annual enplaned pax
News/Gift/Retail planning factor	3.3	4.0	2.9	4.0	SF/1,000 annual enplaned pax
Duty Free planning factor	0.0	0.0	0.0	0.0	SF/1,000 annual enplaned pax
Other services planning factor	0.7	0.7	0.7	0.7	SF/1,000 annual enplaned pax
Concession Support Area	25%	25%	25%	25%	of concession space
Other Public Areas					
Public Seating and Meeter/Greeter Lobbies	5%	5%	5%	5%	seating for __% of pass. & visitors

Table III.3-2
LGA – Estimate of Concession Utilization Factors (CTB)

Applied to annual enplanements in thousands

	Range 0.1 - 0.6		
	Food/Bev	**Retail**	
Passenger Characteristics			
Business/Pleasure	0.2	0.2	
Domestic/Int'l	0.1	0.1	
Originating airport, XXX/other	0.4	0.4	
Daily peaking, low/high	0.2	0.2	
Dwell times, short/long	0.3	0.3	
Facility Characteristics			
Scattered/clustered	0.4	0.4	
Difficult/easy access	0.4	0.4	
Location, away from gates/view of gates	0.2	0.2	
Landside/airside	0.2	0.2	
Term config, short walks/long walks	0.3	0.3	
Retail Characteristics (food/bev)			
Fast food/sit down	0.1		
Variety, not important/important	0.5		
Street pricing Policy, no/strict yes	0.4		
Non-branded/Nat'l,regional brands	0.5		
Retail Characteristics (news/gift/specialty)			
Traditional products/specialtys		0.3	
Non-branded/Nat'l,regional brands		0.5	
Street pricing Policy, no/strict yes		0.4	
Prominence as tourist attraction, low/high		0.5	
UF Factor (Retail factor discounted 25%)	**4.2**	**3.3**	SF/1,000 annual enplanements

Table III.3-3
LGA – Estimate of Concession Utilization Factors
(Delta/NW & US Airways Terminal)

Applied to annual enplanements in thousands

	Range 0.1 - 0.6		
	Food/Bev	Retail	
Passenger Characteristics			
Business/Pleasure	0.2	0.2	
Domestic/Int'l	0.1	0.1	
Originating airport, XXX/other	0.4	0.4	
Daily peaking, low/high	0.2	0.2	
Dwell times, short/long	0.3	0.3	
Facility Characteristics			
Scattered/clustered	0.6	0.6	
Difficult/easy access	0.5	0.5	
Location, away from gates/view of gates	0.4	0.4	
Landside/airside	0.6	0.6	
Term config, short walks/long walks	0.2	0.2	
Retail Characteristics (food/bev)			
Fast food/sit down	0.2		
Variety, not important/important	0.5		
Street pricing Policy, no/strict yes	0.4		
Non-branded/Nat'l,regional brands	0.5		
Retail Characteristics (news/gift/specialty)			
Traditional products/specialtys		0.4	
Non-branded/Nat'l,regional brands		0.5	
Street pricing Policy, no/strict yes		0.4	
Prominence as tourist attraction, low/high		0.5	
UF Factor (Retail factor discounted 25%)	**5.1**	**4.0**	SF/1,000 annual enplanements

Table III.3-4
LGA – Estimate of Concession Utilization Factors
(DL Shuttle Terminal)

Applied to annual enplanements in thousands	Range 0.1 - 0.6		
	Food/Bev	Retail	
Passenger Characteristics			
Business/Pleasure	0.1	0.1	
Domestic/Int'l	0.1	0.1	
Originating airport, XXX/other	0.4	0.4	
Daily peaking, low/high	0.1	0.1	
Dwell times, short/long	0.1	0.1	
Facility Characteristics			
Scattered/clustered	0.4	0.4	
Difficult/easy access	0.4	0.4	
Location, away from gates/view of gates	0.6	0.6	
Landside/airside	0.6	0.6	
Term config, short walks/long walks	0.1	0.1	
Retail Characteristics (food/bev)			
Fast food/sit down	0.1		
Variety, not important/important	0.2		
Street pricing Policy, no/strict yes	0.4		
Non-branded/Nat'l,regional brands	0.3		
Retail Characteristics (news/gift/specialty)			
Traditional products/specialtys		0.1	
Non-branded/Nat'l,regional brands		0.2	
Street pricing Policy, no/strict yes		0.4	
Prominence as tourist attraction, low/high		0.2	
UF Factor (Retail factor discounted 25%)	**3.9**	**2.9**	SF/1,000 annual enplanements

Table III.3-5
LGA – 2015 Remote Parking Positions

	Terminal						Total	Existing
	CTB	Delta Main	Delta Shuttle	US Air				[1]
Regional Aircraft (Group II)							0	6
Narrowbody (Group III)	18	7					25	20
B757 (Group IIIa)	8	2					10	9
Widebody (Group IV)							0	1
B747/A340 (Group V)							0	
A380 (Group VI)							0	
Total Positions	26	9	0	0	0	0	35	36 positions

[1] - Source: Port Authority Aircraft Gates Drawing Number LGA - 9108, 3/8/05

III.3.2 Central Terminal Building Capacity

Gates

The CTB's gates are exclusive use with the exception of two narrow-body common use gates on Concourse B. This can increase the actual number of gates required beyond the gate demands estimated by the common use models. A significant portion of the existing gate capacity is also provided by wide-body gates which are not used by WB equipment either currently or in the forecast schedules. If common use was implemented in the later years of the forecast, and gates reconfigured, there would be enough gates and sufficient frontage to meet the forecast demands. In 2015 the CTB is estimated to need up to 26 hardstand positions if all of the existing gates are used.

It is also recognized that the narrow taxilane alleys, and proximity of some gates to buildings and taxiways limits the ability of some gates to accommodate the full range of aircraft in a given design group. This will require further study to maximize the utilization of the existing frontage.

Ticketing and Check-in

The CTB should have excess staffed ATO positions through the forecast period but additional kiosks would be needed given the assumed future usage of staffed vs. self-service counters. In the current configurations, additional ATO counter length would be needed unless a higher percentage of kiosks are located within the queuing area or elsewhere in the terminal.

Ticket lobby depths are adequate for the projected volumes and types of activity.

Security Screening, Holdrooms and Circulation

The CTB has a shortage of SSCP lanes both for existing conditions and in the future. The existing 15 lanes would need to be increased to between 22 and 26 lanes over the forecast period, and the area per lane increased by 40% as compared to existing conditions. The distribution of the lanes would depend on the long term airline assignments and gate mixes on each concourse.

It is recommended that all of the LGA terminals have 30' wide concourse corridors. The CTB corridors are undersized by 5-9 feet. The situation is further aggrevated by the number of concessions kiosks within these undersized corridors.

Holdrooms are undersized for the current number of gates, and will be significantly undersized in the future even though the gate mix demand (in terms of aircraft gauge) is less than the gate capacity.

Domestic Baggage Claim

The terminal has excess total baggage claim frontage throughout the forecast period given the common use assumptions. Baggage claim area per LF of frontage is within recommended ratios and distances between claim units are adequate.

However, the CTB has a large number of claim units (14) of greatly varying sizes - 60 LF to over 230 LF - averaging 120 LF. Although this allows many individual flights to be displayed on separate claim units, it reduces the flexibility of use. Most of these flat plate claim units also have relatively short input sections which can also limit the utilization of the larger units for multiple flights.

There is also an imbalance of capacity between the east and west wings of the terminal. The current terminal configuration and exclusive use leases do not easily allow airlines in one wing to utilize capacity in the other wing.

Federal Inspection Services Facilities

International arrivals flights requiring FIS facilities are not forecast for LGA.

Airline Space

The CTB is undersized in terms of offices in proximity to the ATO, but has excess capacity over-all due to the large amount of available offices on the third floor. Although less convenient, third floor offices are used for various airline functions.

The terminal in aggregate appears to have excess bag make-up capacity throughout the forecast period. However, over half of the cart staging capacity is located in AA's make-up facility in Hanger 1. As a result, the effective bag make-up area for the remaining airlines is undersized. There is also limited in-line or "behind the wall" EDS equipment which currently crowds the ATO lobbies. As noted under baggage claim, many of the claim units have short input areas which cannot accommodate longer baggage trains.

The CTB has only three active airline clubs (AA, CO and UA), of which only AA's is within the secure area. It is not anticipated that demand for club space will increase in the future given the mix of airlines in the CTB. There is, however, excess non-secure space on the third floor where clubs were previously located for other airlines.

Most airlines in the CTB do not have baggage service offices, and storage space is considered insufficient for forecast activity.

Concessions

Total concessions areas appear adequate for current levels of activity, but are likely inadequate after 2010. However, only 15% of the concessions space is secure as compared to a target of 90%.

Other Public Areas

Most of the existing seating area near Concourse C will be redeveloped for non-secure concessions, thus eliminating the major public seating area in the terminal. The terminal also lacks adequate space outside the SSCPs for visitors meeting arriving passengers.

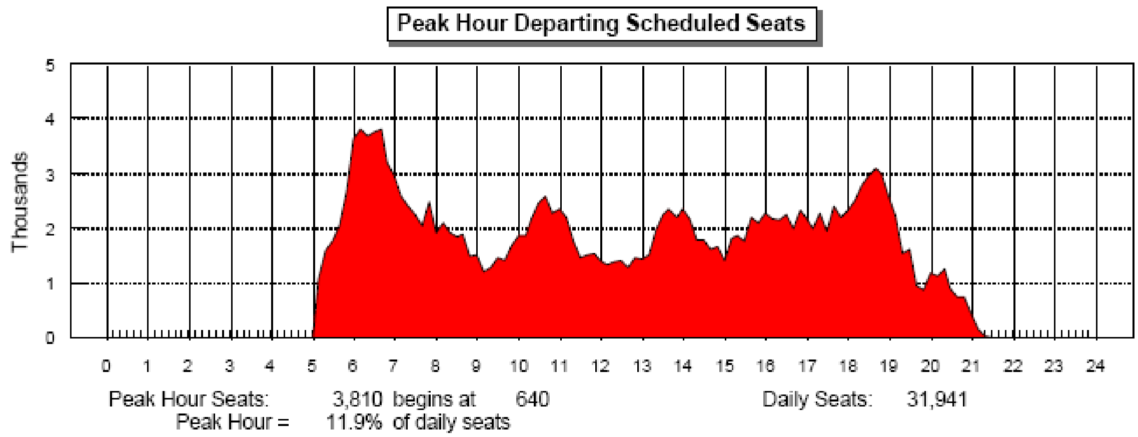
It should also be noted that inbound passengers from the concourses after passing the narrow SSCP areas descend stairs to the arrivals level for baggage claim and ground transportation. In order to use escalators, passengers must continue up ramps and continue across the Departures level. The distance from the SSCP and relationship to the escalators vary by concourse.

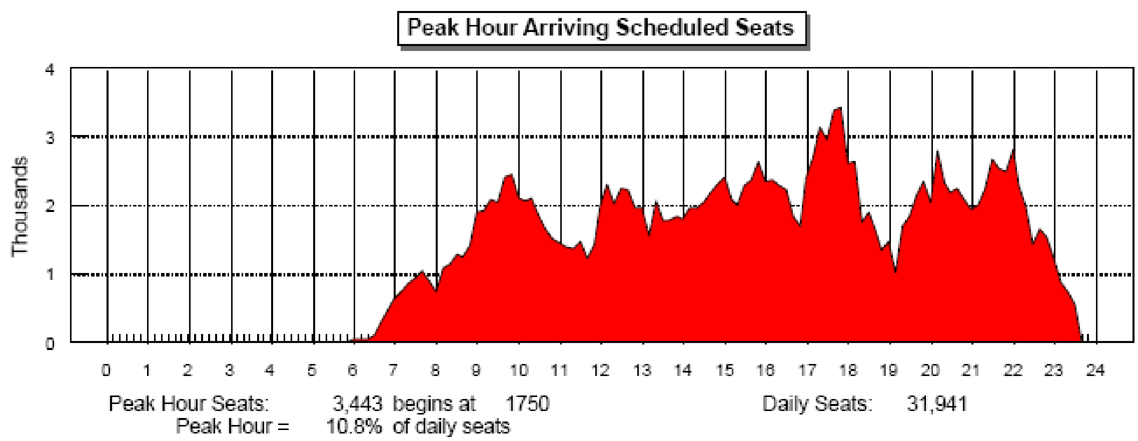
The CTB's non-secure restrooms are estimated to become inadequate by 2010. Secure restrooms are only 60% of the size required.

Annual Capacity

The CTB is relatively in balance in terms of check-in and holdroom at 7.3 - 7.7 million enplanements, except for the SSCP which limits activity to 5.5 million. Gate frontage and baggage claim have significantly more capacity at over 10 million enplanements.

Exhibit III.3-1
LGA – Peak Hour Seats: CTB
(2015 Design Day)





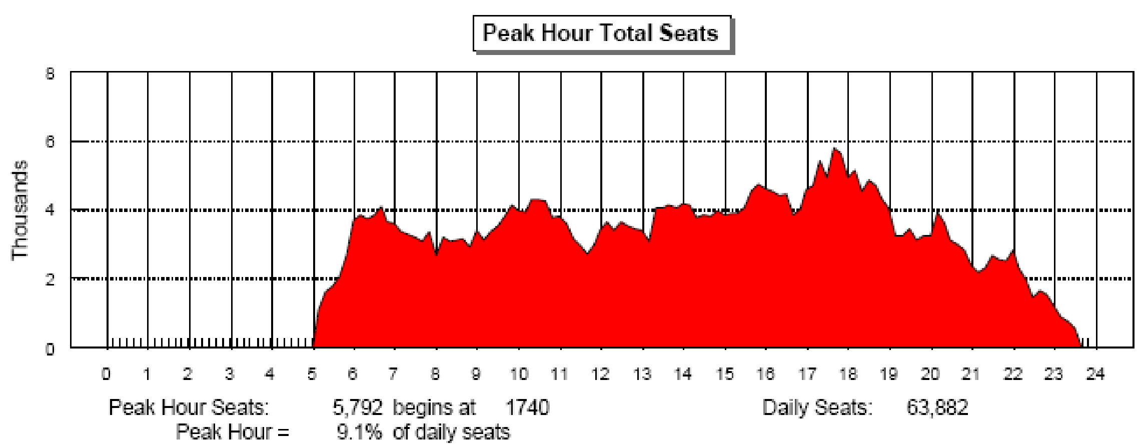


Table III.3-6
LGA –Terminal Capacity Analysis: CTB

Central Terminal Building

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
Annual Enplanements											
Domestic		6,184,739	7,959,900	8,360,500	8,968,200	9,496,100					
International		0	0	0	0	0					
Combined		6,184,739	7,959,900	8,360,500	8,968,200	9,496,100					
Design Hour Factors:											
Domestic Load Factor		90%	90%	90%	90%	90%					
Domestic Connect %		0%	0%	0%	0%	0%					
International Load Factor		0%	0%	0%	0%	0%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		2,760	3,300	3,430	3,680	3,900					
Enplaned Domestic total		2,760	3,300	3,430	3,680	3,900					
Deplaned Domestic O&D		2,410	2,980	3,100	3,330	3,520					
Deplaned Domestic total		2,410	2,980	3,100	3,330	3,520					
Enplaned International O&D		0	0	0	0	0					
Enplaned International total		0	0	0	0	0					
Deplaned International O&D		0	0	0	0	0					
Deplaned International total		0	0	0	0	0					
Meeter/Greeters per O&D Passenger		0.3	0.3	0.3	0.3	0.3					

Table III.3-6
LGA –Terminal Capacity Analysis: CTB

Central Terminal Building

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	5 gates	7	8	9	8	7	(2)	(3)	(4)	(3)	(2) gates
Narrowbody (Group III)	18 gates	25	23	22	26	29	(7)	(5)	(4)	(8)	(11) gates
B757 (Group IIIa)	1 gates	5	7	8	8	8	(4)	(6)	(7)	(7)	(7) gates
Widebody (Group IV)	13 gates						13	13	13	13	13 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	37 gates	37	38	39	42	44	0	(1)	(2)	(5)	(7) gates
Narrowbody Equivalent Gates (NBEG)	42.1 NBEG	35.4	36.3	37.1	40.4	42.7	6.7	5.8	5.0	1.7	-0.6 NBEG
Equivalent Aircraft (EQA)	46.0 EQA	34.3	35.3	36.0	39.6	42.2	11.7	10.7	10.0	6.4	3.8 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	0 gates	0	0	0	0	0	0	0	0	0	0 gates
Narrowbody Equivalent Gates (NBEG)	0.0 NBEG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 NBEG
Equivalent Aircraft (EQA)	0.0 EQA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	94 pos	77	73	76	81	86	17	21	18	13	8 pos
Self-Service Kiosks	61 units	78	89	93	99	105	(17)	(28)	(32)	(38)	(44) units
Equivalent Positions	155 pos	155	162	169	180	191	0	(7)	(14)	(25)	(36) pos
Linear Positions	114 pos	114	120	125	133	141	0	(6)	(11)	(19)	(27) pos
Counter length	550 LF	570	600	630	670	710	(20)	(50)	(80)	(120)	(160) LF
Ticket Lobby - depth	48 LF	50	50	50	50	50	(2)	(2)	(2)	(2)	(2) LF
Ticket Lobby - area	34,280 SF	31,400	33,000	34,700	36,900	39,100	2,880	1,280	(420)	(2,620)	(4,820) SF
Ticket Counter - International											
Conventional Staffed Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Self-Service Kiosks	0 units	0	0	0	0	0	0	0	0	0	0 units
Equivalent Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Linear Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Counter length	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - depth or separation	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - area	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Ticket Counter - area	5,580 SF	5,700	6,000	6,300	6,700	7,100	(120)	(420)	(720)	(1,120)	(1,520) SF
Subtotal	39,860 SF	37,100	39,000	41,000	43,600	46,200					SF

Table III.3-6
LGA –Terminal Capacity Analysis: CTB

Central Terminal Building

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
HOLDROOMS & SECURE CIRCULATION													
Security Screening (SSCP) Lanes	15	lanes	19	22	23	25	26	(4)	(7)	(8)	(10)	(11)	lanes
Checkpoint/Search Area	14,220	SF	24,900	28,900	30,200	32,800	34,100	(10,680)	(14,680)	(15,980)	(18,580)	(19,880)	SF
Secure Circulation	53,740	SF	58,600	60,100	61,400	66,900	70,700	(4,860)	(6,360)	(7,660)	(13,160)	(16,960)	SF
Concourse Width	21-25	LF	30	30	30	30	30	(5-9)	(30)	(30)	(30)	(30)	LF
Sterile (Int'l Arrivals) Circulation	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Holdrooms:													
Regional Aircraft (Groups II & III)		SF	6,000	6,800	7,700	6,800	6,000						SF
Narrowbody (Group III)		SF	51,300	47,200	45,100	53,300	59,500						SF
B757 (Group IIIa)		SF	13,000	18,200	20,800	20,800	20,800						SF
Widebody (Group IV)		SF	0	0	0	0	0						SF
B747/A340 (Group V)		SF	0	0	0	0	0						SF
A380 (Group VI)		SF	0	0	0	0	0						SF
Total Holdroom Area	59,680	SF	70,300	72,200	73,600	80,900	86,300	(10,620)	(12,520)	(13,920)	(21,220)	(26,620)	SF
Subtotal	127,640	SF	153,800	161,200	165,200	180,600	191,100						SF
DOMESTIC BAGGAGE CLAIM													
Claim Frontage Required	-	LF	1,350	1,260	1,310	1,410	1,490						LF
Claim Units	14	units	8	8	8	9	9	6	6	6	5	5	units
Claim Frontage Programmed	1,670	LF	1,360	1,360	1,360	1,530	1,530	310	310	310	140	140	LF
Baggage Claim Area	45,980	SF	40,800	40,800	40,800	45,900	45,900	5,180	5,180	5,180	80	80	SF
FEDERAL INSPECTION SERVICES													
Primary Inspection:								0	0	0	0	0	
Double Inspection Counters	0	dbl. counters	0	0	0	0	0	0	0	0	0	0	dbl. counters
Counter & Queue Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Baggage Claim:													
Claim Frontage Required	-	LF	0	0	0	0	0						LF
Claim Units	0	units	0	0	0	0	0	0	0	0	0	0	units
Claim Frontage Programmed	0	LF	0	0	0	0	0	0	0	0	0	0	LF
Baggage Claim Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Subtotal	0	SF	0	0	0	0	0						SF

Table III.3-6
LGA – Terminal Capacity Analysis: CTB

Central Terminal Building

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
AIRLINE SPACE											
ATO Offices	6,810 SF	17,100	18,000	18,900	20,100	21,300	(10,290)	(11,190)	(12,090)	(13,290)	(14,490) SF
Airline Operations & Offices (excluding ATO)	106,630 SF	82,300	84,700	86,400	95,000	101,300	24,330	21,930	20,230	11,630	5,330 SF
Baggage Handling											
Estimated make-up capacity	100 [2] carts/LD3s	69	71	72	79	84	(69)	(71)	(72)	(79)	(84) carts/LD3s
Baggage Make-up area	64,600 SF	41,200	42,400	43,200	47,500	50,600	23,400	22,200	21,400	17,100	14,000 SF
Checked Baggage Screening	8,960 SF	22,400	25,600	25,600	28,800	32,000	(13,440)	(16,640)	(16,640)	(19,840)	(23,040) SF
Baggage Claim Off-load	18,790 SF	20,000	20,000	20,000	22,500	22,500	(1,210)	(1,210)	(1,210)	(3,710)	(3,710) SF
Airline Clubs & 1st/Bus. Class Lounges	26,980 SF	27,000	27,000	27,000	27,000	27,000	(20)	(20)	(20)	(20)	(20) SF
Baggage Service Offices	2,900 SF	3,600	4,500	4,700	5,000	5,300	(700)	(1,600)	(1,800)	(2,100)	(2,400) SF
Subtotal	235,670 SF	213,600	222,200	225,800	245,900	260,000					SF
CONCESSIONS											
Ground Services/Information Counter	3,210 SF	800	800	800	800	800	2,410	2,410	2,410	2,410	2,410 SF
Food/Beverage; Secure	4,777 SF	23,400	30,100	31,600	33,900	35,900	(18,623)	(25,323)	(26,823)	(29,123)	(31,123) SF
News/Gift/Retail; Secure	3,290 SF	18,400	23,600	24,800	26,600	28,200	(15,110)	(20,310)	(21,510)	(23,310)	(24,910) SF
Subtotal; Secure Concessions	8,067 SF	41,800	53,700	56,400	60,500	64,100	(33,733)	(45,633)	(48,333)	(52,433)	(56,033) SF
Food/Beverage; Non-Secure	27,420 SF	2,600	3,300	3,500	3,800	4,000	24,820	24,120	23,920	23,620	23,420 SF
News/Gift/Retail; Non-Secure	18,990 SF	2,000	2,600	2,800	3,000	3,100	16,990	16,390	16,190	15,990	15,890 SF
Subtotal; Non-Secure Concessions	46,410 SF	4,600	5,900	6,300	6,800	7,100	41,810	40,510	40,110	39,610	39,310 SF
Duty Free	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Other Services	1,270 SF	4,300	5,600	5,900	6,300	6,600	(3,030)	(4,330)	(4,630)	(5,030)	(5,330) SF
Concession Support Area	11,668 SF	12,700	16,300	17,200	18,400	19,500	(1,032)	(4,632)	(5,532)	(6,732)	(7,832) SF
Subtotal	70,625 SF	64,200	82,300	86,600	92,800	98,100					SF
OTHER PUBLIC AREAS											
Public Seating and Meeter/Greeter Lobbies	740 SF	2,300	2,900	3,000	3,200	3,400	(1,560)	(2,160)	(2,260)	(2,460)	(2,660) SF
Restrooms - Terminal Locations	6,870 SF	6,300	7,700	8,100	8,700	9,200	570	(830)	(1,230)	(1,830)	(2,330) SF
Restrooms - Concourse Locations	4,820 SF	7,900	8,100	8,300	9,100	9,700	(3,080)	(3,280)	(3,480)	(4,280)	(4,880) SF
Subtotal	12,430 SF	16,500	18,700	19,400	21,000	22,300					SF
Vacant spaces suitable for: airline offices; non-secure clubs	55,520 SF										SF

[1] - Sources:
DMJM + Harris -
LaGuardia Airport Modernization Program
CTB Program Analysis, August 2004
Hirsh Associates site visit, May 2005
Hirsh Associates analysis

III.3.3 Delta / Northwest Terminal Capacity

Gates

The terminal's gates are exclusive use between DL and NW which increases the actual number of gates slightly beyond the common use model. Delta also uses up to six bus-accessed hardstands for RJs which are not included in the official Airport gate count. Assuming that some of these bus hardstands continue to be used, the terminal should have adequate gate capacity through the forecast period. In 2015 the terminal is estimated to need up to 9 positions for overnight parking if all of the existing gates are used.

Ticketing and Check-in

The DL/NW terminal should have excess ATO counter length to accommodate the mix of staffed positions and kiosks throughout the forecast period.

The ticket lobby is slightly narrower than recommended over most of its width (45' vs 50'), but the location of curbside baggage conveyors results in choke points (37' depth) at two locations which constrict passenger movement.

Security Screening, Holdrooms and Circulation

The DL/NW terminal would need to add between two and three lanes over the forecast period. The existing area per lane is adequate.
It is recommended that all of the LGA terminals have 30' wide concourse corridors. The terminal meets this dimension.

The holdrooms in aggregate are slightly undersized for current and future demands, although some individual holdrooms are properly sized.

Domestic Baggage Claim

The terminal has adequate total baggage claim frontage throughout the forecast period. Baggage claim area per LF of frontage is within recommended ratios and distances between claim units are adequate. The 200 LF claim units are suitable for accommodating multiple flights.

Federal Inspection Services Facilities

International arrivals flights requiring FIS facilities are not forecast for LGA.

Airline Space

The DL/NW terminal has sufficient office and operations space to meet forecast demands.

The terminal has adequate make-up space throughout the forecast period. Checked baggage screening is done by a combination of lobby (NW) and a "behind the wall" facility (DL). It is assumed that these will be replaced by permanent in-line EDS systems in the future. Baggage input is adequate.

Delta and Northwest both have clubs. Delta's was expanded in the past few years. The NW club, however is considered undersized compared to other similar airlines at LGA.

Bag service offices and storage is considered adequate though 2010.

Concessions

Almost all of the concessions are located in the secure portions of the terminal. It is estimated that concessions are undersized for current activity.

Other Public Areas

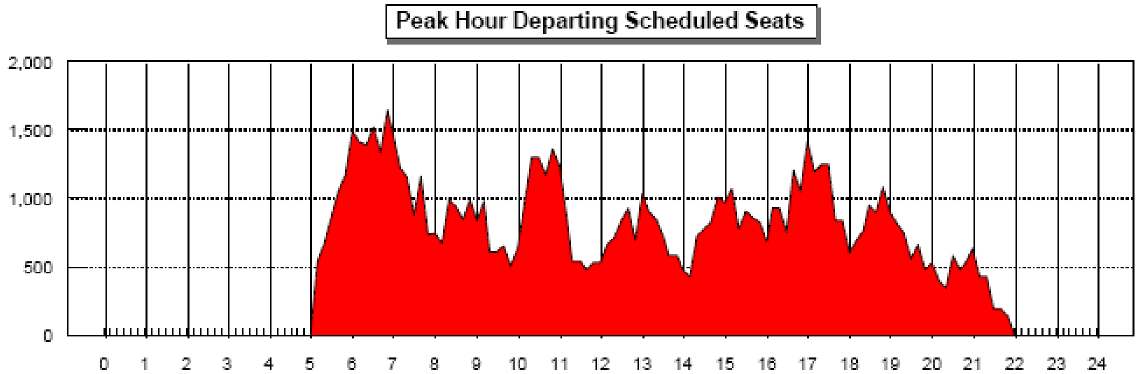
The terminal has adequate space in total, however a large portion of the space is traditional non-secure waiting areas. The terminal lacks adequate space outside the SSCPs for visitors meeting arriving passengers.

The terminal has adequate secure and non-secure restrooms.

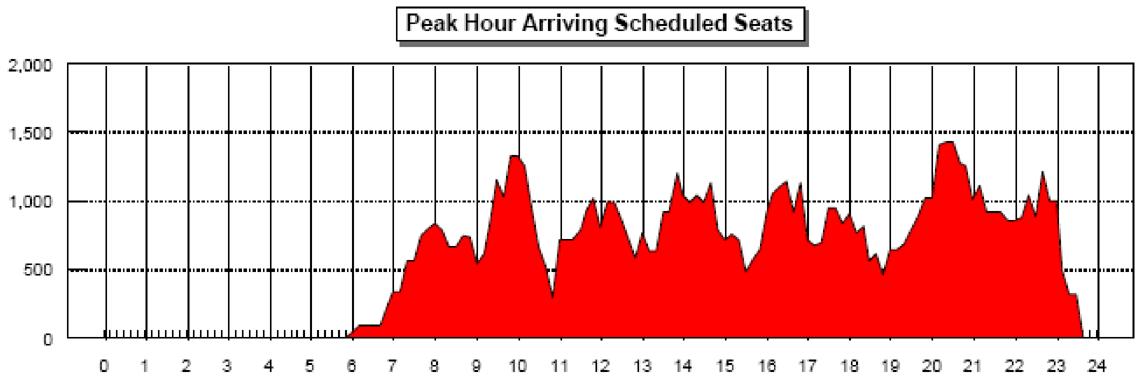
Annual Capacity

The DL/NW terminal's gates and holdroom are in balance at 3.2 million enplanements, but the SSCP limits capacity to 2.5 million. Check-in capacity is greater.

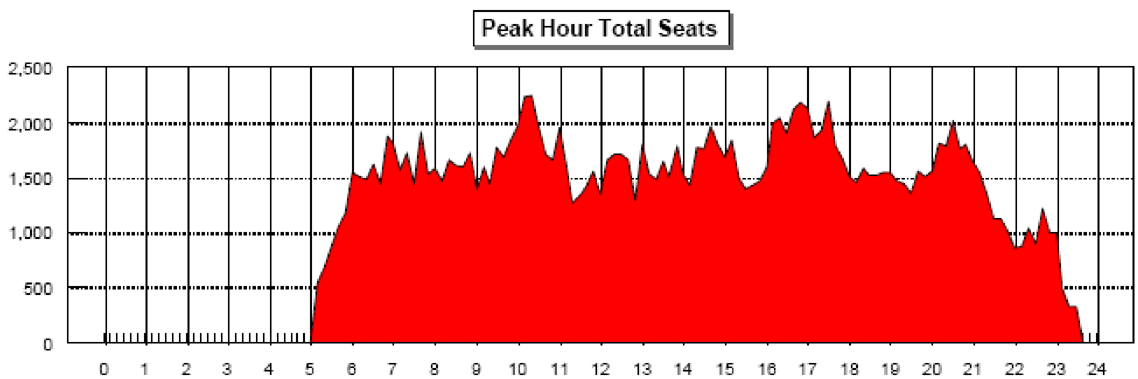
Exhibit III.3-2
LGA – Peak Hour Seats: Delta / Northwest Terminal
(2015 Design Day)



Peak Hour Seats: 1,643 begins at 650 Daily Seats: 14,253
Peak Hour = 11.5% of daily seats



Peak Hour Seats: 1,435 begins at 2020 Daily Seats: 14,253
Peak Hour = 10.1% of daily seats



Peak Hour Seats: 2,252 begins at 1020 Daily Seats: 28,506
Peak Hour = 7.9% of daily seats

Table III.3-7
LGA –Terminal Capacity Analysis: Delta / Northwest Terminal

Delta/Northwest Terminal

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand					Projected Surplus / (Deficiency)				
		Base Year Activity	Forecast Year Activity				Base Year Activity	Forecast Year Activity			
		2004	2010	2015	2020	2025	2004	2010	2015	2020	2025
Annual Enplanements											
Domestic		3,126,444	3,325,900	3,524,500	3,668,900	3,892,500					
International		0	0	0	0	0					
Combined		3,126,444	3,325,900	3,524,500	3,668,900	3,892,500					
Design Hour Factors:											
Domestic Load Factor		90%	90%	90%	90%	90%					
Domestic Connect %		0%	0%	0%	0%	0%					
International Load Factor		0%	0%	0%	0%	0%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		1,160	1,410	1,480	1,540	1,630					
Enplaned Domestic total		1,160	1,410	1,480	1,540	1,630					
Deplaned Domestic O&D		1,110	1,230	1,290	1,340	1,420					
Deplaned Domestic total		1,110	1,230	1,290	1,340	1,420					
Enplaned International O&D		0	0	0	0	0					
Enplaned International total		0	0	0	0	0					
Deplaned International O&D		0	0	0	0	0					
Deplaned International total		0	0	0	0	0					
Meeter/Greeters per O&D Passenger		0.1	0.1	0.1	0.1	0.1					

Table III.3-7
LGA – Terminal Capacity Analysis: Delta / Northwest Terminal

Delta/Northwest Terminal

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	0 gates	7	5	4	4	4	(7)	(5)	(4)	(4)	(4) gates
Narrowbody (Group III)	2 gates	3	3	3	3	3	(1)	(1)	(1)	(1)	(1) gates
B757 (Group IIIa)	3 gates	4	3	2	2	2	(1)	0	1	1	1 gates
Widebody (Group IV)	5 gates	1	3	4	4	4	4	2	1	1	1 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	10 gates	15	14	13	13	13	(5)	(4)	(3)	(3)	(3) gates
Narrowbody Equivalent Gates (NBEG)	12.8 NBEG	13.8	14.3	14.0	14.0	14.0	-1.0	-1.5	-1.2	-1.2	-1.2 NBEG
Equivalent Aircraft (EQA)	15.4 EQA	12.9	14.6	14.8	14.8	14.8	2.5	0.8	0.6	0.6	0.6 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	0 gates	0	0	0	0	0	0	0	0	0	0 gates
Narrowbody Equivalent Gates (NBEG)	0.0 NBEG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 NBEG
Equivalent Aircraft (EQA)	0.0 EQA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	29 pos	14	14	15	16	17	15	15	14	13	12 pos
Self-Service Kiosks	31 units	29	30	32	33	35	2	1	(1)	(2)	(4) units
Equivalent Positions	60 pos	43	44	47	49	52	17	16	13	11	8 pos
Linear Positions	36 pos	26	27	29	30	32	10	9	7	6	4 pos
Counter length	224 LF	160	160	170	180	190	64	64	54	44	34 LF
Ticket Lobby - depth	37-45 LF	50	50	50	50	50	(5-13)	(5-13)	(5-13)	(5-13)	(5-13) LF
Ticket Lobby - area	9,730 SF	8,800	8,800	9,400	9,900	10,500	930	930	330	(170)	(770) SF
Ticket Counter - International											
Conventional Staffed Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Self-Service Kiosks	0 units	0	0	0	0	0	0	0	0	0	0 units
Equivalent Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Linear Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Counter length	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - depth or separation	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - area	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Ticket Counter - area	2,680 SF	1,900	1,900	2,000	2,200	2,300	780	780	680	480	380 SF
Subtotal	12,410 SF	10,700	10,700	11,400	12,100	12,800					SF

Table III.3-7
LGA –Terminal Capacity Analysis: Delta / Northwest Terminal

Delta/Northwest Terminal

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	
HOLDROOMS & SECURE CIRCULATION													
Security Screening (SSCP) Lanes	5	lanes	6	7	7	7	8	(1)	(2)	(2)	(2)	(3)	lanes
Checkpoint/Search Area	6,490	SF	7,900	9,200	9,200	9,200	10,500	(1,410)	(2,710)	(2,710)	(2,710)	(4,010)	SF
Secure Circulation	26,400	SF	22,900	23,700	23,200	23,200	23,200	3,500	2,700	3,200	3,200	3,200	SF
Concourse Width	30	LF	30	30	30	30	30	0	0	0	0	0	LF
Sterile (Int'l Arrivals) Circulation	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Holdrooms:													
Regional Aircraft (Groups II & III)		SF	6,000	4,300	3,400	3,400	3,400						SF
Narrowbody (Group III)		SF	6,200	6,200	6,200	6,200	6,200						SF
B757 (Group IIIa)		SF	10,400	7,800	5,200	5,200	5,200						SF
Widebody (Group IV)		SF	3,200	9,500	12,600	12,600	12,600						SF
B747/A340 (Group V)		SF	0	0	0	0	0						SF
A380 (Group VI)		SF	0	0	0	0	0						SF
Total Holdroom Area	23,940	SF	25,800	27,800	27,400	27,400	27,400	(1,860)	(3,860)	(3,460)	(3,460)	(3,460)	SF
Subtotal	56,830	SF	56,600	60,700	59,800	59,800	61,100						SF
DOMESTIC BAGGAGE CLAIM													
Claim Frontage Required	-	LF	550	510	530	550	590						LF
Claim Units	3	units	3	3	3	3	3	0	0	0	0	0	units
Claim Frontage Programmed	617	LF	600	600	600	600	600	17	17	17	17	17	LF
Baggage Claim Area	19,120	SF	18,000	18,000	18,000	18,000	18,000	1,120	1,120	1,120	1,120	1,120	SF
FEDERAL INSPECTION SERVICES													
Primary Inspection:								0	0	0	0	0	
Double Inspection Counters	0	dbl. counters	0	0	0	0	0	0	0	0	0	0	dbl. counters
Counter & Queue Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Baggage Claim:													
Claim Frontage Required	-	LF	0	0	0	0	0						LF
Claim Units	0	units	0	0	0	0	0	0	0	0	0	0	units
Claim Frontage Programmed	0	LF	0	0	0	0	0	0	0	0	0	0	LF
Baggage Claim Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Subtotal	0	SF	0	0	0	0	0						SF

Table III.3-7
LGA –Terminal Capacity Analysis: Delta / Northwest Terminal

Delta/Northwest Terminal

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
AIRLINE SPACE											
ATO Offices	5,490 SF	4,800	4,800	5,100	5,400	5,700	690	690	390	90	(210) SF
Airline Operations & Offices (excluding ATO)	44,630 SF	36,100	40,900	41,400	41,400	41,400	8,530	3,730	3,230	3,230	3,230 SF
Baggage Handling											
Estimated make-up capacity	48 carts/LD3s	26	29	30	30	30	22	19	18	18	18 carts/LD3s
Baggage Make-up area	20,530 SF	12,900	14,600	14,800	14,800	14,800	7,630	5,930	5,730	5,730	5,730 SF
Checked Baggage Screening	1,770 SF	9,600	9,600	9,600	9,600	9,600	(7,830)	(7,830)	(7,830)	(7,830)	(7,830) SF
Baggage Claim Off-load	9,420 SF	7,500	7,500	7,500	7,500	7,500	1,920	1,920	1,920	1,920	1,920 SF
Airline Clubs & 1st/Bus. Class Lounges	9,530 SF	9,500	10,100	10,700	11,200	11,900	30	(570)	(1,170)	(1,670)	(2,370) SF
Baggage Service Offices	2,460 SF	2,200	2,500	2,600	2,700	2,800	260	(40)	(140)	(240)	(340) SF
Subtotal	93,830 SF	82,600	90,000	91,700	92,600	93,700					SF
CONCESSIONS											
Ground Services/Information Counter	260 SF	200	200	200	200	200	60	60	60	60	60 SF
Food/Beverage; Secure	14,980 SF	14,400	15,300	16,200	16,800	17,900	580	(320)	(1,220)	(1,820)	(2,920) SF
News/Gift/Retail; Secure	3,380 SF	11,300	12,000	12,700	13,200	14,000	(7,920)	(8,620)	(9,320)	(9,820)	(10,620) SF
Subtotal; Secure Concessions	18,360 SF	25,700	27,300	28,900	30,000	31,900	(7,340)	(8,940)	(10,540)	(11,640)	(13,540) SF
Food/Beverage; Non-Secure	150 SF	1,600	1,700	1,800	1,900	2,000	(1,450)	(1,550)	(1,650)	(1,750)	(1,850) SF
News/Gift/Retail; Non-Secure	180 SF	1,300	1,300	1,400	1,500	1,600	(1,120)	(1,120)	(1,220)	(1,320)	(1,420) SF
Subtotal; Non-Secure Concessions	330 SF	2,900	3,000	3,200	3,400	3,600	(2,570)	(2,670)	(2,870)	(3,070)	(3,270) SF
Duty Free	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Other Services	50 SF	2,200	2,300	2,500	2,600	2,700	(2,150)	(2,250)	(2,450)	(2,550)	(2,650) SF
Concession Support Area	5,690 SF	7,700	8,200	8,700	9,000	9,600	(2,010)	(2,510)	(3,010)	(3,310)	(3,910) SF
Subtotal	24,690 SF	38,700	41,000	43,500	45,200	48,000					SF
OTHER PUBLIC AREAS											
Public Seating and Meeter/Greeter Lobbies	1,900 SF	900	1,000	1,100	1,100	1,200	1,000	900	800	800	700 SF
Restrooms - Terminal Locations	1,200 SF	2,400	2,700	2,800	2,900	3,100	(1,200)	(1,500)	(1,600)	(1,700)	(1,900) SF
Restrooms - Concourse Locations	4,340 SF	3,000	3,400	3,400	3,400	3,400	1,340	940	940	940	940 SF
Subtotal	7,440 SF	6,300	7,100	7,300	7,400	7,700					SF
Vacant spaces suitable for:	0 SF										SF

[1] - Sources:
Silvester + Tafuro Architects -
terminal renovation plans, October 2000
Hirsh Associates site visit, May 2005
Hirsh Associates analysis

III.3.4 Delta Shuttle Terminal Capacity

Gates

The Delta Shuttle terminal's gate demands are not expected to change over the forecast period, and will continue to have excess gate capacity.

Ticketing and Check-in

The terminal should have adequate ATO counter for the forecast mix of staffed and kiosk positions.

The ticket lobby is very constrained and only half of the recommended depth (20' vs 40') as a result of locating checked baggage screening equipment behind the ATO counter.

Security Screening, Holdrooms and Circulation

The Shuttle terminal requires a third lane for existing and future conditions, and the area per lane would need to double.

It is recommended that all of the LGA terminals have 30' wide concourse corridors. The Shuttle terminal has an single common holdroom with internal circulation linked to the terminal by a wide (36') connector, so the corridor width comparison is not comparable.

The holdrooms are undersized when applying the LGA standards. However, since there are at most three departures from the four gates, the holdroom is adequate for projected demands. If the full gate capacity of the terminal was to be used for more typical airline scheduling, the holdrooms would be significantly undersized.

Domestic Baggage Claim

The terminal has excess baggage claim frontage throughout the forecast period. Baggage claim area per LF of frontage is within recommended ratios and distances between claim units are adequate. The 220 LF claim unit can accommodate multiple flights.

Federal Inspection Services Facilities

International arrivals flights requiring FIS facilities are not forecast for LGA.

Airline Space

The terminal does not have offices adjacent to the ATO but over-all is considered to have adequate office and operations space for the Shuttle operation.

The terminal does not have adequate, enclosed make-up space if all of the gates were to be actively used. Baggage screening also would need to be re-located to free up ATO lobby space.

There is no club in the terminal and none is anticipated.

Bag service offices and storage is considered adequate though the forecast period.

Concessions

All of the concessions are located in the secure portions of the terminal, and are extremely limited. The cafeteria in the main portion of the Marine Terminal has not been included since its location does not make it easily visible to Shuttle passengers.

Other Public Areas

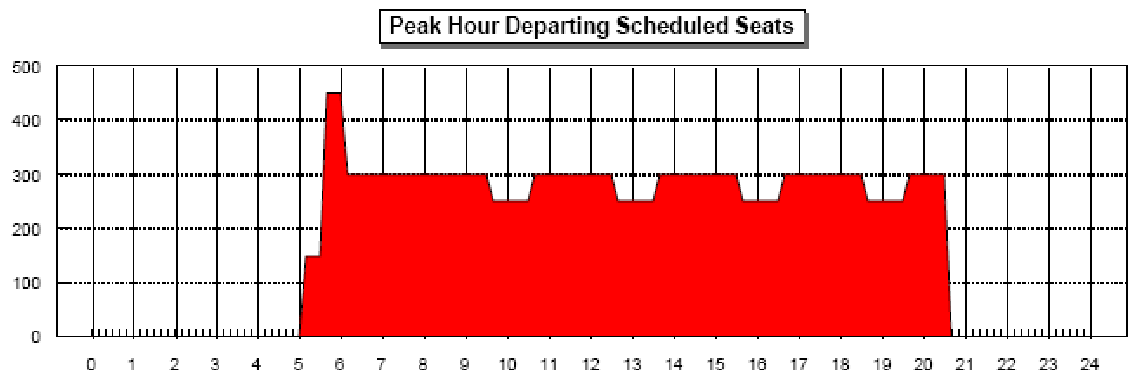
The terminal lacks any designated waiting areas for meeter/greeters.

The terminal has no non-secure restrooms in proximity to its landside functions, but there are restrooms in the main section of the Marine terminal. Secure restrooms are slightly undersized.

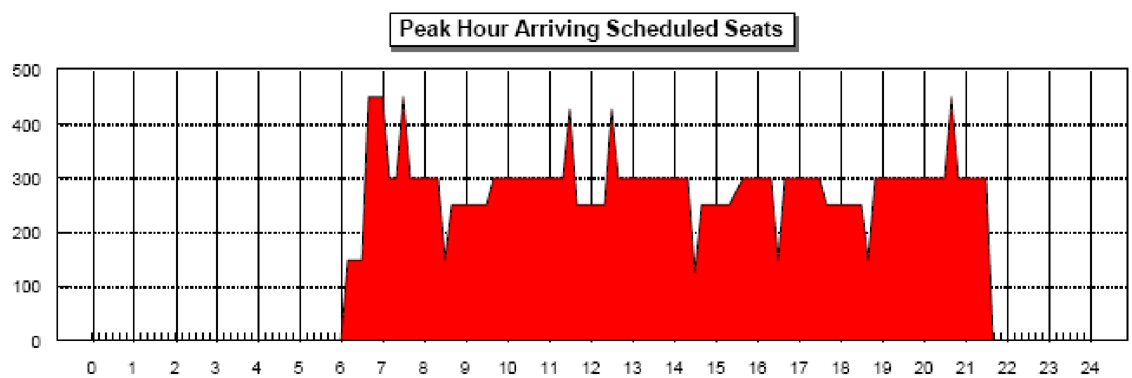
Annual Capacity

The Delta Shuttle terminal's capacity is between 0.5 and 1.1 million enplanements, with SSCP being the limiting factor.

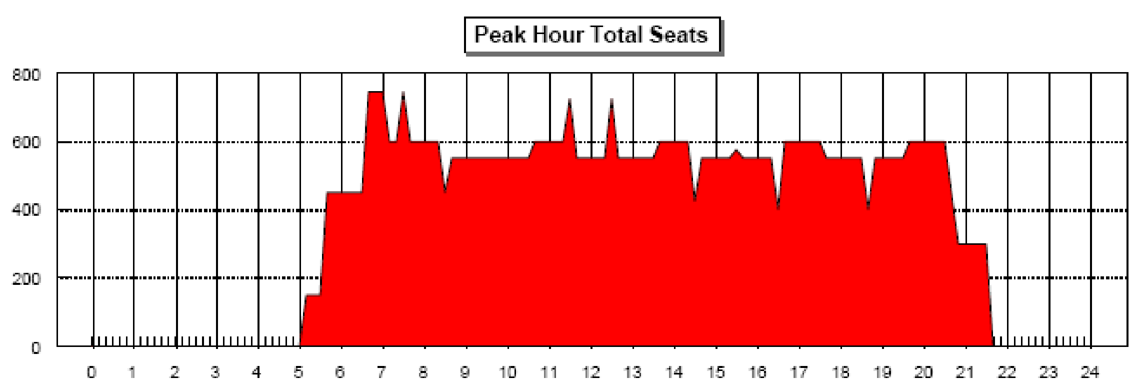
Exhibit III.3-3
LGA – Peak Hour Seats: Delta Shuttle Terminal
(2015 Design Day)



Peak Hour Seats:	450	begins at	540	Daily Seats:	4,458
Peak Hour =	10.1%	of daily seats			



Peak Hour Seats:	450	begins at	640	Daily Seats:	4,458
Peak Hour =	10.1%	of daily seats			



Peak Hour Seats:	750	begins at	730	Daily Seats:	8,916
Peak Hour =	8.4%	of daily seats			

Table III.3-8
LGA –Terminal Capacity Analysis: Delta Shuttle Terminal

Delta Shuttle Terminal

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand					Projected Surplus / (Deficiency)				
		Base Year Activity	Forecast Year Activity				Base Year Activity	Forecast Year Activity			
		2004	2010	2015	2020	2025	2004	2010	2015	2020	2025
Annual Enplanements											
Domestic		679,040	679,800	732,900	774,600	819,900					
International		0	0	0	0	0					
Combined		679,040	679,800	732,900	774,600	819,900					
Design Hour Factors:											
Domestic Load Factor		90%	90%	90%	90%	90%					
Domestic Connect %		0%	0%	0%	0%	0%					
International Load Factor		0%	0%	0%	0%	0%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		350	380	410	430	460					
Enplaned Domestic total		350	380	410	430	460					
Deplaned Domestic O&D		350	380	410	430	460					
Deplaned Domestic total		350	380	410	430	460					
Enplaned International O&D		0	0	0	0	0					
Enplaned International total		0	0	0	0	0					
Deplaned International O&D		0	0	0	0	0					
Deplaned International total		0	0	0	0	0					
Meeter/Greeters per O&D Passenger		0.1	0.1	0.1	0.1	0.1					

Table III.3-8
LGA –Terminal Capacity Analysis: Delta Shuttle Terminal

Delta Shuttle Terminal

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	0 gates						0	0	0	0	0 gates
Narrowbody (Group III)	6 gates	4	4	4	4	4	2	2	2	2	2 gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	6 gates	4	4	4	4	4	2	2	2	2	2 gates
Narrowbody Equivalent Gates (NBEG)	6.0 NBEG	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0 NBEG
Equivalent Aircraft (EQA)	6.0 EQA	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	0 gates	0	0	0	0	0	0	0	0	0	0 gates
Narrowbody Equivalent Gates (NBEG)	0.0 NBEG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 NBEG
Equivalent Aircraft (EQA)	0.0 EQA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	8 pos	5	5	5	6	6	3	3	3	2	2 pos
Self-Service Kiosks	8 units	7	7	8	8	9	1	1	0	0	(1) units
Equivalent Positions	16 pos	12	12	13	14	15	4	4	3	2	1 pos
Linear Positions	16 pos	12	12	13	14	15	4	4	3	2	1 pos
Counter length	60 LF	60	60	70	70	80	0	0	(10)	(10)	(20) LF
Ticket Lobby - depth	20 LF	40	40	40	40	40	(20)	(20)	(20)	(20)	(20) LF
Ticket Lobby - area	1,200 SF	2,700	2,700	3,200	3,200	3,600	(1,500)	(1,500)	(2,000)	(2,000)	(2,400) SF
Ticket Counter - International											
Conventional Staffed Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Self-Service Kiosks	0 units	0	0	0	0	0	0	0	0	0	0 units
Equivalent Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Linear Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Counter length	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - depth or separation	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - area	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Ticket Counter - area	960 SF	600	600	700	700	800	360	360	260	260	160 SF
Subtotal	2,160 SF	3,300	3,300	3,900	3,900	4,400					SF

Table III.3-8
LGA –Terminal Capacity Analysis: Delta Shuttle Terminal

Delta Shuttle Terminal

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
HOLDROOMS & SECURE CIRCULATION													
Security Screening (SSCP) Lanes	2	lanes	3	3	3	3	3	(1)	(1)	(1)	(1)	(1)	lanes
Checkpoint/Search Area	1,380	SF	3,900	3,900	3,900	3,900	3,900	(2,520)	(2,520)	(2,520)	(2,520)	(2,520)	SF
Secure Circulation	13,880	SF	6,600	6,600	6,600	6,600	6,600	7,280	7,280	7,280	7,280	7,280	SF
Concourse Width	10-36'	LF	30	30	30	30	30	na	na	na	na	na	LF
Sterile (Int'l Arrivals) Circulation	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Holdrooms:													
Regional Aircraft (Groups II & III)		SF	0	0	0	0	0						SF
Narrowbody (Group III)		SF	8,200	8,200	8,200	8,200	8,200						SF
B757 (Group IIIa)		SF	0	0	0	0	0						SF
Widebody (Group IV)		SF	0	0	0	0	0						SF
B747/A340 (Group V)		SF	0	0	0	0	0						SF
A380 (Group VI)		SF	0	0	0	0	0						SF
Total Holdroom Area	6,100	SF	8,200	8,200	8,200	8,200	8,200	(2,100)	(2,100)	(2,100)	(2,100)	(2,100)	SF
Subtotal	21,360	SF	18,700	18,700	18,700	18,700	18,700						SF
DOMESTIC BAGGAGE CLAIM													
Claim Frontage Required	-	LF	60	70	70	80	80						LF
Claim Units	1	units	1	1	1	1	1	0	0	0	0	0	units
Claim Frontage Programmed	220	LF	170	170	170	170	170	50	50	50	50	50	LF
Baggage Claim Area	4,860	SF	5,100	5,100	5,100	5,100	5,100	(240)	(240)	(240)	(240)	(240)	SF
FEDERAL INSPECTION SERVICES													
Primary Inspection:								0	0	0	0	0	
Double Inspection Counters	0	dbl. counters	0	0	0	0	0	0	0	0	0	0	dbl. counters
Counter & Queue Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Baggage Claim:													
Claim Frontage Required	-	LF	0	0	0	0	0						LF
Claim Units	0	units	0	0	0	0	0	0	0	0	0	0	units
Claim Frontage Programmed	0	LF	0	0	0	0	0	0	0	0	0	0	LF
Baggage Claim Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Subtotal	0	SF	0	0	0	0	0						SF

Table III.3-8
LGA –Terminal Capacity Analysis: Delta Shuttle Terminal

Delta Shuttle Terminal

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
AIRLINE SPACE													
ATO Offices	0	SF	1,800	1,800	2,100	2,100	2,400	(1,800)	(1,800)	(2,100)	(2,100)	(2,400)	SF
Airline Operations & Offices (excluding ATO)	10,150	SF	6,800	6,800	6,800	6,800	6,800	3,350	3,350	3,350	3,350	3,350	SF
Baggage Handling													
Estimated make-up capacity	8	carts/LD3s	8	8	8	8	8	0	0	0	0	0	carts/LD3s
Baggage Make-up area	2,400	SF	4,800	4,800	4,800	4,800	4,800	(2,400)	(2,400)	(2,400)	(2,400)	(2,400)	SF
Checked Baggage Screening	0	SF	6,400	6,400	6,400	6,400	6,400	(6,400)	(6,400)	(6,400)	(6,400)	(6,400)	SF
Baggage Claim Off-load	1,100	SF	2,500	2,500	2,500	2,500	2,500	(1,400)	(1,400)	(1,400)	(1,400)	(1,400)	SF
Airline Clubs & 1st/Bus. Class Lounges	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Baggage Service Offices	420	SF	400	400	400	400	500	20	20	20	20	(80)	SF
Subtotal	14,070	SF	22,700	22,700	23,000	23,000	23,400						SF
CONCESSIONS													
Ground Services/Information Counter	0	SF	800	200	200	200	200	(800)	(200)	(200)	(200)	(200)	SF
Food/Beverage; Secure	300	SF	2,400	2,400	2,600	2,700	2,900	(2,100)	(2,100)	(2,300)	(2,400)	(2,600)	SF
News/Gift/Retail; Secure	200	SF	1,800	1,800	1,900	2,000	2,100	(1,600)	(1,600)	(1,700)	(1,800)	(1,900)	SF
Subtotal; Secure Concessions	500	SF	4,200	4,200	4,500	4,700	5,000	(3,700)	(3,700)	(4,000)	(4,200)	(4,500)	SF
Food/Beverage; Non-Secure	0	SF	300	300	300	300	300	(300)	(300)	(300)	(300)	(300)	SF
News/Gift/Retail; Non-Secure	0	SF	200	200	200	200	200	(200)	(200)	(200)	(200)	(200)	SF
Subtotal; Non-Secure Concessions	0	SF	500	500	500	500	500	(500)	(500)	(500)	(500)	(500)	SF
Duty Free	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Other Services	350	SF	500	500	500	500	600	(150)	(150)	(150)	(150)	(250)	SF
Concession Support Area	0	SF	1,300	1,300	1,400	1,400	1,500	(1,300)	(1,300)	(1,400)	(1,400)	(1,500)	SF
Subtotal	850	SF	7,300	6,700	7,100	7,300	7,800						SF
OTHER PUBLIC AREAS													
Public Seating and Meeter/Greeter Lobbies	0	SF	300	300	300	400	400	(300)	(300)	(300)	(400)	(400)	SF
Restrooms - Terminal Locations	0	SF	800	800	900	900	1,000	(800)	(800)	(900)	(900)	(1,000)	SF
Restrooms - Concourse Locations	720	SF	900	900	900	900	900	(180)	(180)	(180)	(180)	(180)	SF
Subtotal	720	SF	2,000	2,000	2,100	2,200	2,300						SF

Vacant spaces suitable for:

	0	SF		SF

[1] - Sources:
Port Authority of NY & NJ -
Pan Am Shuttle plan, August 1986
Hirsh Associates site visit, May 2005
Hirsh Associates analysis

III.3.5 US Airways Terminal Capacity

Gates

The terminal should have sufficient gate capacity to meet demands through the forecast period. In terms of aircraft mix, there is excess frontage capacity (NBEG) if gates are permanently reconfigured for RJ use. The existing gate mix can accommodate the RON demand which is mostly NB.

Ticketing and Check-in

The terminal should have excess ATO counter length to accommodate the mix of staffed positions and kiosks throughout the forecast period.

Ticket lobby depths are adequate for the projected volumes and types of activity.

Security Screening, Holdrooms and Circulation

The terminal has an adequate number of lanes throughout the forecast period, although the utilization of the two SSCP locations at present is not well balanced due to visibility and signage. The area per lane should increase by 50% to meet TSA standards.

It is recommended that all of the LGA terminals have 30' wide concourse corridors. The main concourse of the US Airways terminal meets or exceeds this dimension. The shuttle concourse has an single common holdroom with internal circulation so the corridor width comparison is not comparable.

The terminal has large holdrooms originally designed for widebody aircraft, and will have significant excess capacity through the forecast period.

Domestic Baggage Claim

The terminal has excess total baggage claim frontage throughout the forecast period. Baggage claim area per LF of frontage is within recommended ratios and distances between claim units are adequate. The 185 LF claim units in the main terminal are suitable for accommodating multiple flights, while the smaller shuttle claim units are adequate for typical shuttle loads.

Federal Inspection Services Facilities

International arrivals flights requiring FIS facilities are not forecast for LGA.

Airline Space

The terminal has sufficient office and operations space to meet forecast demands.

The terminal has adequate make-up space throughout the forecast period. Checked baggage screening is done at the ends of the ticket lobby and are not as disruptive to passenger flow as in some other terminals. However, it is assumed that these will be replaced by permanent in-line EDS systems in the future. Baggage input is adequate.

The US Airways club is considered adequate through the forecast period.

Bag service offices and storage is considered adequate though the forecast period.

Concessions

Almost 96% of the concessions are located in the secure portions of the terminal. It is estimated that concessions are adequate though the forecast period.

Other Public Areas

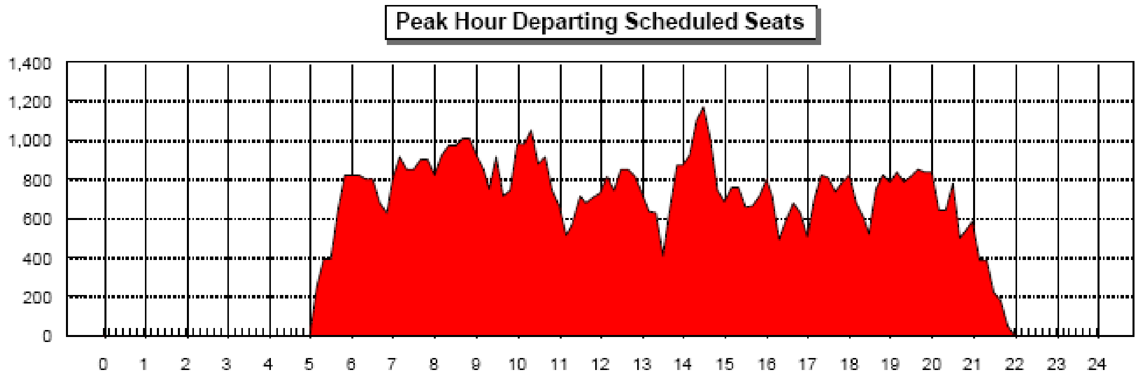
The terminal lacks any designated waiting areas for meeter/greeters.

The terminal has adequate secure and non-secure restrooms.

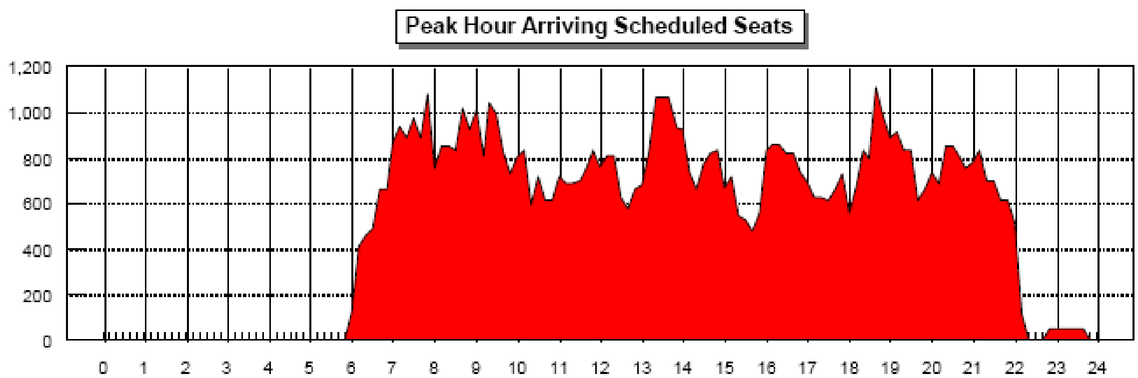
Annual Capacity

The US Airways terminal is relatively in balance in terms of check-in and holdroom at 4.0 - 4.4 million enplanements, except for the SSCP which limits activity to 2.6 million. Baggage claim capacity is similar to check-in and holdroom.

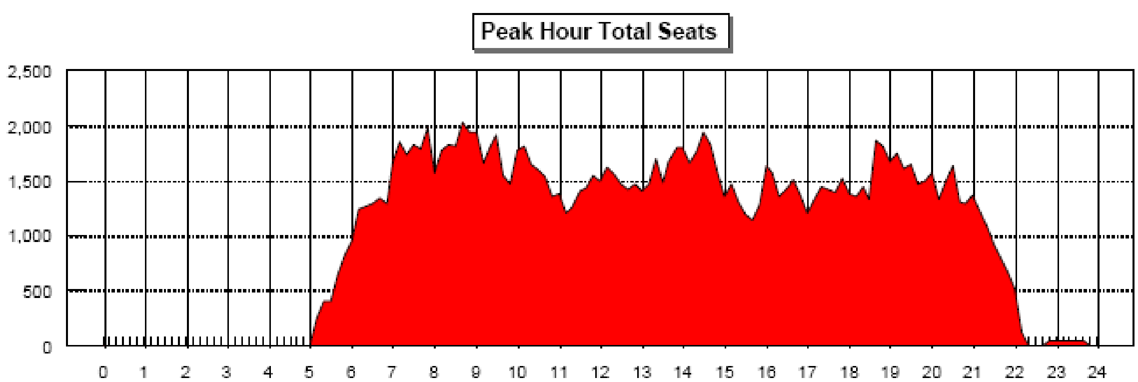
Exhibit III.3-4
LGA – Peak Hour Seats: US Airways Terminal
(2015 Design Day)



Peak Hour Seats: 1,171 begins at 1430 Daily Seats: 12,391
Peak Hour = 9.5% of daily seats



Peak Hour Seats: 1,109 begins at 1840 Daily Seats: 12,391
Peak Hour = 9.0% of daily seats



Peak Hour Seats: 2,030 begins at 840 Daily Seats: 24,782
Peak Hour = 8.2% of daily seats

Table III.3-9
LGA –Terminal Capacity Analysis: US Airways Terminal

US Airways Terminal

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
Annual Enplanements											
Domestic		2,243,479	2,474,300	2,600,600	2,644,200	2,756,800					
International		0	0	0	0	0					
Combined		2,243,479	2,474,300	2,600,600	2,644,200	2,756,800					
Design Hour Factors:											
Domestic Load Factor		85%	85%	85%	85%	85%					
Domestic Connect %		0%	0%	0%	0%	0%					
International Load Factor		0%	0%	0%	0%	0%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		1,030	960	1,000	1,020	1,060					
Enplaned Domestic total		1,030	960	1,000	1,020	1,060					
Deplaned Domestic O&D		1,000	900	940	960	1,000					
Deplaned Domestic total		1,000	900	940	960	1,000					
Enplaned International O&D		0	0	0	0	0					
Enplaned International total		0	0	0	0	0					
Deplaned International O&D		0	0	0	0	0					
Deplaned International total		0	0	0	0	0					
Meeter/Greeters per O&D Passenger		0.2	0.2	0.2	0.2	0.2					

Table III.3-9
LGA –Terminal Capacity Analysis: US Airways Terminal

US Airways Terminal

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Recommended Facilities - Demand: Forecast Year Activity 2010	Recommended Facilities - Demand: Forecast Year Activity 2015	Recommended Facilities - Demand: Forecast Year Activity 2020	Recommended Facilities - Demand: Forecast Year Activity 2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Projected Surplus / (Deficiency): Forecast Year Activity 2010	Projected Surplus / (Deficiency): Forecast Year Activity 2015	Projected Surplus / (Deficiency): Forecast Year Activity 2020	Projected Surplus / (Deficiency): Forecast Year Activity 2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	0 gates	9	10	10	9	8	(9)	(10)	(10)	(9)	(8) gates
Narrowbody (Group III)	15 gates	8	9	10	10	12	7	6	5	5	3 gates
B757 (Group IIIa)	5 gates						5	5	5	5	5 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	20 gates	17	19	20	19	20	3	1	0	1	0 gates
Narrowbody Equivalent Gates (NBEG)	20.5 NBEG	14.3	16.0	17.0	16.3	17.6	6.2	4.5	3.5	4.2	2.9 NBEG
Equivalent Aircraft (EQA)	21.5 EQA	11.6	13.0	14.0	13.6	15.2	9.9	8.5	7.5	7.9	6.3 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	0 gates	0	0	0	0	0	0	0	0	0	0 gates
Narrowbody Equivalent Gates (NBEG)	0.0 NBEG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 NBEG
Equivalent Aircraft (EQA)	0.0 EQA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	24 pos	13	11	11	11	12	11	13	13	13	12 pos
Self-Service Kiosks	27 units	24	19	19	20	21	3	8	8	7	6 units
Equivalent Positions	51 pos	37	30	30	31	33	14	21	21	20	18 pos
Linear Positions	46 pos	34	28	28	28	30	12	18	18	18	16 pos
Counter length	258 LF	170	140	140	140	150	88	118	118	118	108 LF
Ticket Lobby - depth	46 LF	45	45	45	45	45	1	1	1	1	1 LF
Ticket Lobby - area	15,820 SF	8,500	7,000	7,000	7,000	7,500	7,320	8,820	8,820	8,820	8,320 SF
Ticket Counter - International											
Conventional Staffed Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Self-Service Kiosks	0 units	0	0	0	0	0	0	0	0	0	0 units
Equivalent Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Linear Positions	0 pos	0	0	0	0	0	0	0	0	0	0 pos
Counter length	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - depth or separation	0 LF	0	0	0	0	0	0	0	0	0	0 LF
Ticket Lobby - area	0 SF	0	0	0	0	0	0	0	0	0	0 SF
Ticket Counter - area	2,580 SF	1,700	1,400	1,400	1,400	1,500	880	1,180	1,180	1,180	1,080 SF
Subtotal	18,400 SF	10,200	8,400	8,400	8,400	9,000					SF

Table III.3-9
LGA –Terminal Capacity Analysis: US Airways Terminal

US Airways Terminal

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand					Projected Surplus / (Deficiency)					
			Base Year Activity	Forecast Year Activity				Base Year Activity	Forecast Year Activity				
			2004	2010	2015	2020	2025	2004	2010	2015	2020	2025	
HOLDROOMS & SECURE CIRCULATION													
Security Screening (SSCP) Lanes	6	lanes	6	5	6	6	6	0	1	0	0	0	lanes
Checkpoint/Search Area	5,040	SF	7,900	6,600	7,900	7,900	7,900	(2,860)	(1,560)	(2,860)	(2,860)	(2,860)	SF
Secure Circulation	58,600	SF	23,700	26,500	28,200	27,000	29,100	34,900	32,100	30,400	31,600	29,500	SF
Concourse Width	40	LF	30	30	30	30	30	10	10	10	10	10	LF
Sterile (Int'l Arrivals) Circulation	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Holdrooms:													
Regional Aircraft (Groups II & III)		SF	7,700	8,500	8,500	7,700	6,800						SF
Narrowbody (Group III)		SF	16,400	18,500	20,500	20,500	24,600						SF
B757 (Group IIIa)		SF	0	0	0	0	0						SF
Widebody (Group IV)		SF	0	0	0	0	0						SF
B747/A340 (Group V)		SF	0	0	0	0	0						SF
A380 (Group VI)		SF	0	0	0	0	0						SF
Total Holdroom Area	45,000	SF	24,100	27,000	29,000	28,200	31,400	20,900	18,000	16,000	16,800	13,600	SF
Subtotal	108,640	SF	55,700	60,100	65,100	63,100	68,400						SF
DOMESTIC BAGGAGE CLAIM													
Claim Frontage Required	-	LF	450	410	420	430	450						LF
Claim Units	5	units	3	3	3	3	3	2	2	2	2	2	units
Claim Frontage Programmed	770	LF	510	510	510	510	510	260	260	260	260	260	LF
Baggage Claim Area	38,110	SF	15,300	15,300	15,300	15,300	15,300	22,810	22,810	22,810	22,810	22,810	SF
FEDERAL INSPECTION SERVICES													
Primary Inspection:								0	0	0	0	0	
Double Inspection Counters	0	dbl. counters	0	0	0	0	0	0	0	0	0	0	dbl. counters
Counter & Queue Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Baggage Claim:													
Claim Frontage Required	-	LF	0	0	0	0	0						LF
Claim Units	0	units	0	0	0	0	0	0	0	0	0	0	units
Claim Frontage Programmed	0	LF	0	0	0	0	0	0	0	0	0	0	LF
Baggage Claim Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Subtotal	0	SF	0	0	0	0	0						SF

Table III.3-9
LGA –Terminal Capacity Analysis: US Airways Terminal

US Airways Terminal

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
AIRLINE SPACE													
ATO Offices	8,730	SF	5,100	4,200	4,200	4,200	4,500	3,630	4,530	4,530	4,530	4,230	SF
Airline Operations & Offices (excluding ATO)	45,540	SF	31,300	35,100	37,800	36,700	41,000	14,240	10,440	7,740	8,840	4,540	SF
Baggage Handling													
Estimated make-up capacity	30	carts/LD3s	23	26	28	27	30	7	4	2	3	(0)	carts/LD3s
Baggage Make-up area	22,750	SF	13,900	15,600	16,800	16,300	18,200	8,850	7,150	5,950	6,450	4,550	SF
Checked Baggage Screening	0	SF	9,600	9,600	9,600	9,600	9,600	(9,600)	(9,600)	(9,600)	(9,600)	(9,600)	SF
Baggage Claim Off-load	14,300	SF	7,500	7,500	7,500	7,500	7,500	6,800	6,800	6,800	6,800	6,800	SF
Airline Clubs & 1st/Bus. Class Lounges	8,380	SF	8,400	8,400	8,400	8,400	8,400	(20)	(20)	(20)	(20)	(20)	SF
Baggage Service Offices	1,900	SF	1,500	1,400	1,400	1,400	1,500	400	500	500	500	400	SF
Subtotal	101,600	SF	77,300	81,800	85,700	84,100	90,700						SF
CONCESSIONS													
Ground Services/Information Counter	280	SF	400	400	400	400	400	(120)	(120)	(120)	(120)	(120)	SF
Food/Beverage; Secure	18,260	SF	10,300	11,400	11,900	12,100	12,700	7,960	6,860	6,360	6,160	5,560	SF
News/Gift/Retail; Secure	11,860	SF	8,100	8,900	9,400	9,500	9,900	3,760	2,960	2,460	2,360	1,960	SF
Subtotal; Secure Concessions	30,120	SF	18,400	20,300	21,300	21,600	22,600	11,720	9,820	8,820	8,520	7,520	SF
Food/Beverage; Non-Secure	950	SF	1,100	1,300	1,300	1,300	1,400	(150)	(350)	(350)	(350)	(450)	SF
News/Gift/Retail; Non-Secure	360	SF	900	1,000	1,000	1,100	1,100	(540)	(640)	(640)	(740)	(740)	SF
Subtotal; Non-Secure Concessions	1,310	SF	2,000	2,300	2,300	2,400	2,500	(690)	(990)	(990)	(1,090)	(1,190)	SF
Duty Free	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Other Services	70	SF	1,600	1,700	1,800	1,900	1,900	(1,530)	(1,630)	(1,730)	(1,830)	(1,830)	SF
Concession Support Area	1,100	SF	5,500	6,100	6,400	6,500	6,800	(4,400)	(5,000)	(5,300)	(5,400)	(5,700)	SF
Subtotal	32,880	SF	27,900	30,800	32,200	32,800	34,200						SF
OTHER PUBLIC AREAS													
Public Seating and Meeter/Greeter Lobbies	0	SF	900	800	800	900	900	(900)	(800)	(800)	(900)	(900)	SF
Restrooms - Terminal Locations	2,990	SF	2,400	2,200	2,300	2,300	2,400	590	790	690	690	590	SF
Restrooms - Concourse Locations	4,790	SF	2,700	3,000	3,200	3,100	3,500	2,090	1,790	1,590	1,690	1,290	SF
Subtotal	7,780	SF	6,000	6,000	6,300	6,300	6,800						SF
Vacant spaces suitable for: airline offices; non-secure clubs	0	SF											SF

[1] - Sources:
Port Authority of NY & NJ -
Continental & Eastern Airlines,
terminal plans, April, 1990
Hirsh Associates site visit, May 2005
Hirsh Associates analysis

III.3.6 Annual Airport Terminal Capacity

In total, using the key determinants, LGA would have a terminal capacity range of 11.1 - 20.7 million enplanements. Using the more effective capacities described for each terminal, the terminal capacity range is 11.1 - 16.4 million enplanements. See Table III.3-10.

In summary, (million annual enplanement capacities):

	Minimum	Maximum	Effective Maximum	Based on
Central Terminal	5.5	10.7	7.7	holdrooms & check-in
Delta / Northwest	2.5	4.5	3.2	holdrooms & gates
Delta Shuttle		0.5	1.1	1.1 gates & check-in
US Airways	2.6	4.4	4.4	holdrooms & check-in
Total	11.1	20.7	16.4	

Table III.3-10
LGA – Annual Capacity Estimates

Key Determinants of Annual Capacity

A. Domestic Equivalent Check-in Positions

	Existing Facilities (positions)	Design Hour Capacity (O&D enplanements)	Annual Capacity (domestic enplanements)
Central Terminal	155	3,150	7.7
Delta / Northwest	60	1,890	4.5
Delta Shuttle	16	500	0.9
US Airways	51	1,700	4.4
		Airport Total Capacity:	**17.5 million domestic**

B. International Equivalent Check-in Positions

	Existing Facilities (positions)	Design Hour Capacity (O&D enplanements)	Annual Capacity (international enplanements)
Central Terminal	0	0	0.0
Delta / Northwest	0	0	0.0
Delta Shuttle	0	0	0.0
US Airways	0	0	0.0
		Airport Total Capacity:	**0.0 million international**

C. Security Screening (SSCP) Lanes

	Existing Facilities (lanes)	Design Hour Capacity (O&D enplanements)	Annual Capacity (combined enplanements)
Central Terminal	15	2,240	5.5
Delta / Northwest	5	1,060	2.5
Delta Shuttle	2	270	0.5
US Airways	6	1,000	2.6
		Airport Total Capacity:	**11.1 million combined**

Table III.3-10
LGA – Annual Capacity Estimates

Key Determinants of Annual Capacity – Con't

D. Contact Gates

	Existing Facilities (NBEG)	Design Hour Capacity (NBEG)	Annual Capacity (combined enplanements)
Central Terminal	42.1	42.1	10.7
Delta / Northwest	12.8	12.8	3.2
Delta Shuttle	6.0	6.0	1.1
US Airways	20.5	20.5	3.1
		Airport Total Capacity:	**18.1 million combined**

E. Holdrooms

	Existing Facilities (square feet)	Design Hour Capacity (EQA)	Annual Capacity (combined enplanements)
Central Terminal	59,680	29.2	7.3
Delta / Northwest	23,940	12.9	3.1
Delta Shuttle	6,100	3.0	0.5
US Airways	45,000	21.7	4.0
		Airport Total Capacity:	**14.9 million combined**

Table III.3-11
LGA – Annual Capacity Estimates

Secondary Determinants of Annual Capacity

A. Domestic Baggage Claim

	Existing Facilities (linear feet)	Design Hour Capacity (O&D deplanements)	Annual Capacity (domestic enplanements)
Central Terminal	1670	3,810	10.3
Delta / Northwest	617	1,330	3.6
Delta Shuttle	220	530	0.9
US Airways	770	1,420	3.9
		Airport Total Capacity:	**18.7 million domestic**

B. International Primary Inspection

	Existing Facilities (positions)	Design Hour Capacity (deplanements)	Annual Capacity (international enplanements)
Central Terminal	0	0	0
Delta / Northwest	0	0	0
Delta Shuttle	0	0	0
US Airways	0	0	0
		Airport Total Capacity:	**0.0 million international**

C. International Baggage Claim

	Existing Facilities (linear feet)	Design Hour Capacity (deplanements)	Annual Capacity (international enplanements)
Central Terminal	0	0	0
Delta / Northwest	0	0	0
Delta Shuttle	0	0	0
US Airways	0	0	0
		Airport Total Capacity:	**0.0 million international**

Table III.3-12
LGA – Annual Capacity Estimates

Summary of Annual Capacity Estimates

Key Determinants -

	Million Annual Enplanements Based on:						
	Check-in Positions			SSCP	Gates	Holdrooms	Capacity Range
	Dom.	Int'l	Combined	Lanes			
Central Terminal	7.7	0.0	7.7	5.5	10.7	7.3	5.5 - 10.7
Delta / Northwest	4.5	0.0	4.5	2.5	3.2	3.1	2.5 - 4.5
Delta Shuttle	0.9	0.0	0.9	0.5	1.1	0.5	0.5 - 1.1
US Airways	4.4	0.0	4.4	2.6	3.1	4.0	2.6 - 4.4
				Airport Total Capacity Range:			**11.1 - 20.7 million enplanements**

Secondary Determinants -

	Million Annual Enplanements Based on:				
	Baggage Claim			Primary Inspection	Capacity Range
	Dom.	Int'l	Combined	Int'l	International
Central Terminal	10.3	0.0	10.3	0.0	0.0 - 0.0
Delta / Northwest	3.6	0.0	3.6	0.0	0.0 - 0.0
Delta Shuttle	0.9	0.0	0.9	0.0	0.0 - 0.0
US Airways	3.9	0.0	3.9	0.0	0.0 - 0.0
Airport Total Capacity Ranges:			**18.7 million enplanements**		**0.0 - 0.0 million international enplanements**

III.4 On-Airport Roadway & Terminal Frontage Capacity

III.4.1 On-Airport Roadways

The on-airport roadways considered in this analysis include all the internal circulation, recirculation and ramp roadways north of the Grand Central Parkway (GCP), the 94th and 102nd Street Bridges which connect the airport with the local Queens street system and the flyover from the eastbound GCP. LaGuardia Airport can be divided into three terminal areas—the Marine Air Terminal, which is the westernmost terminal of the airport, the Central Terminal Building (CTB) and the east end terminals of US Airways and Delta. The overall layout of the LaGuardia Airport on-airport roadways is provided on Exhibit III.4-1.

III.4.2 Critical Roadway Segments

Nine critical on-airport roadway segments were identified at LaGuardia Airport, as illustrated on Exhibit III.4-2. These segments include the eastbound GCP flyover, the inbound 94th Street Bridge, the loop ramp to the east end terminals from the north service road and several segments that both lead to the east end and serve as recirculation roadways.

III.4.3 On-Airport Roadway Capacity and Operations

In order to analyze the operations of each critical roadway segment under baseline as well as future forecast traffic levels, threshold values for LOS C through LOS E (the flow at the transition point to the next LOS, i.e., LOS C to LOS D) were derived for each critical segment as well as baseline 2004, forecast 2015 and 2025 AM and PM peak hour traffic volumes, as discussed in Section I.4. The LOS threshold values for each roadway segment, segment traffic volumes for 2004 baseline, 2015 and 2025 forecasts and segment levels of service under each traffic demand condition are provided in Table III.4-1 for AM and PM peak hours, respectively.

As shown, under 2004 baseline conditions, the inbound loop ramp from the north service road to east end terminals (Segment 7) was found to operate at LOS D during the AM peak hour and at capacity during the PM peak hour. Additionally, the loop ramp from the Grand Central Parkway flyover to the east end terminals (Segment 3) and the weaving segment to the Delta Terminal (Segment 6) operate in LOS D during the PM peak hour. Although the eastbound Grand Central Parkway flyover ramp inbound is a two lane ramp and its capacity is derived as such, its functional capacity is limited by the weaving section at the beginning of the ramp on the GCP.

Exhibit III.4-1
LGA Overall Layout

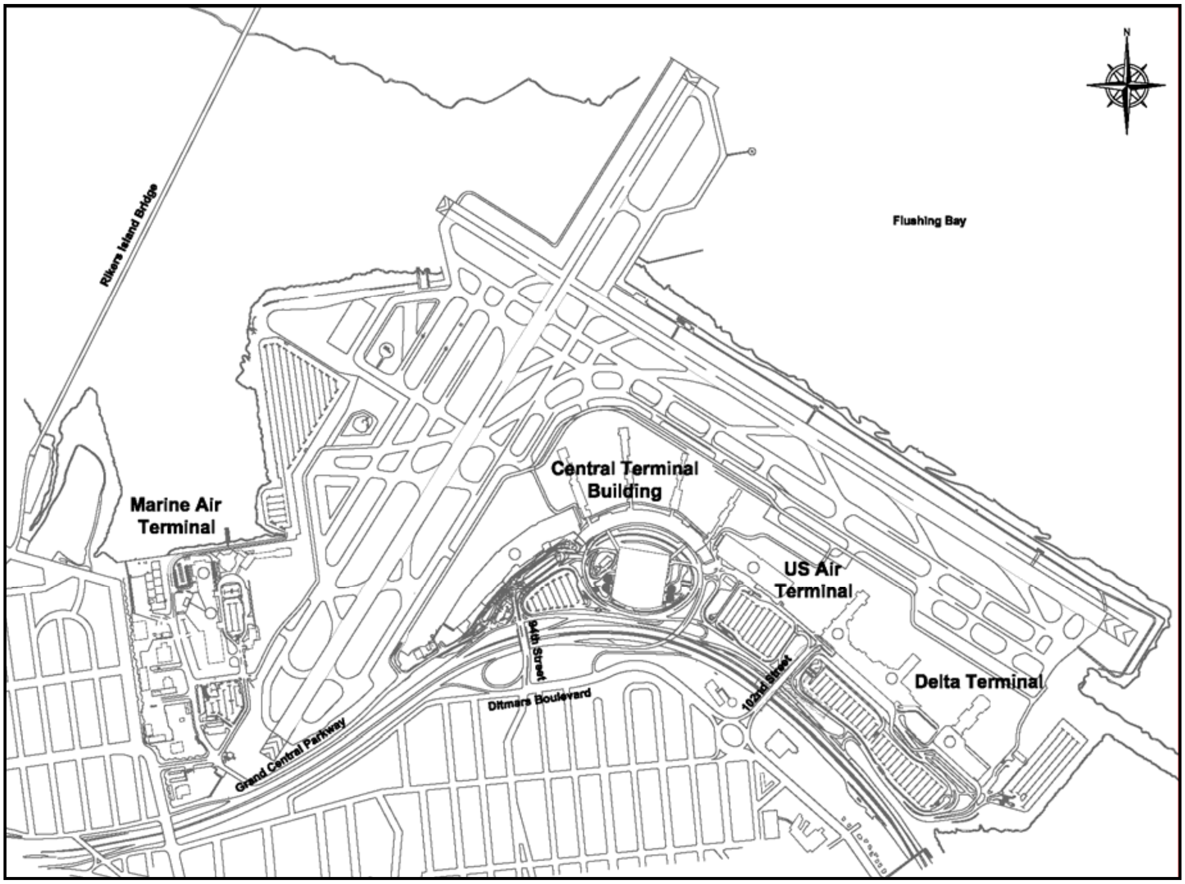
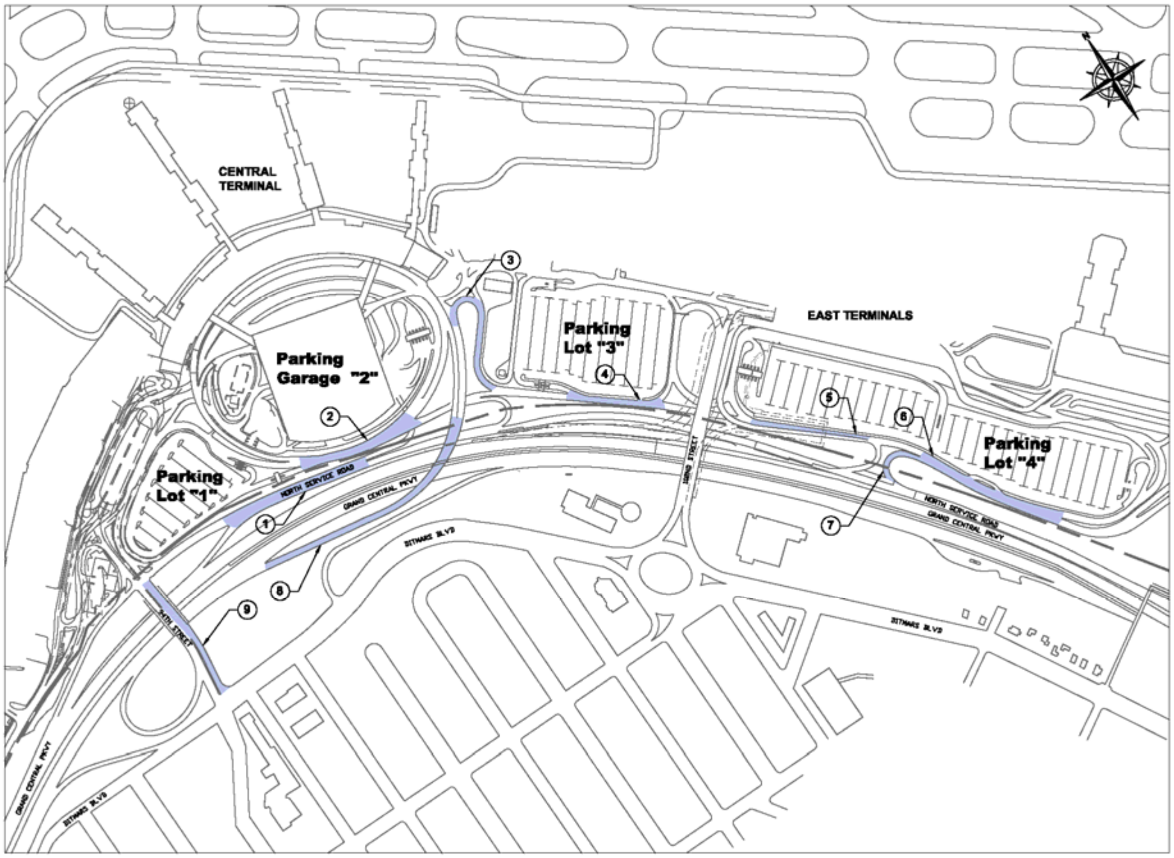


Exhibit III.4-2
LGA On-Airport Critical Roadway Segments



LEGEND:
CRITICAL ROADWAY SEGMENTS

Table III.4-1
LGA On-Airport Critical Roadway Segments (AM and PM)

AIRPORT ROADWAY DESCRIPTION		Base Year 2004 AM Peak Traffic (Vehicles/Hour)	Forecast 2015 AM Peak Traffic (Vehicles/Hour)	Forecast 2025 AM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
1	North Service Road and CTB Parking Exit Weave	2,670 (≥ C)	3,200 (D)	3,620 (D)	2,925	3,875	4,750
2	To CTB, East Terminals and CTB Recirculation Weave	1,500 (≥ C)	1,630 (≥ C)	1,830 (≥ C)	2,925	3,875	4,750
3	Loop Ramp to East Terminals	790 (≥ C)	910 (D)	990 (D)	810	1,070	1,250
4	Parking Lot 3 Exit and La Guardia Road Merge	1,470 (≥ C)	1,660 (≥ C)	1,850 (≥ C)	2,340	3,100	3,800
5	East Terminals Recirculating Road	1,640 (≥ C)	2,030 (≥ C)	2,210 (≥ C)	2,925	3,875	4,750
6	Weaving Segment to Delta Terminal	1,930 (≥ C)	2,310 (≥ C)	2,520 (≥ C)	2,925	3,875	4,750
7	Grand Central Parkway Westbound	810 (D)	920 (D)	1,000 (E)	800	950	1,100
8	Grand Central Parkway Eastbound	1,130 (≥ C)	1,530 (≥ C)	1,720 (≥ C)	2,150	2,850	3,500
9	94th Street	490 (≥ C)	650 (≥ C)	730 (≥ C)	1,200	1,400	1,600

Notes:
1. (≥ C) = Level of Service A, B or C, (D) = Level of Service D, (E) = Level of Service E, (F) = Level of Service F

AIRPORT ROADWAY DESCRIPTION		Base Year 2004 PM Peak Traffic (Vehicles/Hour)	Forecast 2015 PM Peak Traffic (Vehicles/Hour)	Forecast 2025 PM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
1	North Service Road and CTB Parking Exit Weave	2,170 (≥ C)	2,540 (≥ C)	2,870 (≥ C)	2,925	3,875	4,750
2	To CTB, East Terminals and CTB Recirculation Weave	1,750 (≥ C)	1,690 (≥ C)	1,900 (≥ C)	2,925	3,875	4,750
3	Loop Ramp to East Terminals	840 (D)	950 (D)	1,040 (D)	810	1,070	1,250
4	Parking Lot 3 Exit and La Guardia Road Merge	1,670 (≥ C)	1,920 (≥ C)	2,140 (≥ C)	2,340	3,100	3,800
5	East Terminals Recirculating Road	2,650 (≥ C)	3,280 (D)	3,580 (D)	2,925	3,875	4,750
6	Weaving Segment to Delta Terminal	3,070 (D)	3,610 (D)	3,940 (E)	2,925	3,875	4,750
7	Grand Central Parkway Westbound	1,100 (E)	1,260 (F)	1,370 (F)	800	950	1,100
8	Grand Central Parkway Eastbound	1,520 (≥ C)	1,860 (≥ C)	2,090 (≥ C)	2,150	2,850	3,500
9	94th Street	670 (≥ C)	870 (≥ C)	980 (≥ C)	1,200	1,400	1,600

Notes:
1. (≥ C) = Level of Service A, B or C, (D) = Level of Service D, (E) = Level of Service E, (F) = Level of Service F

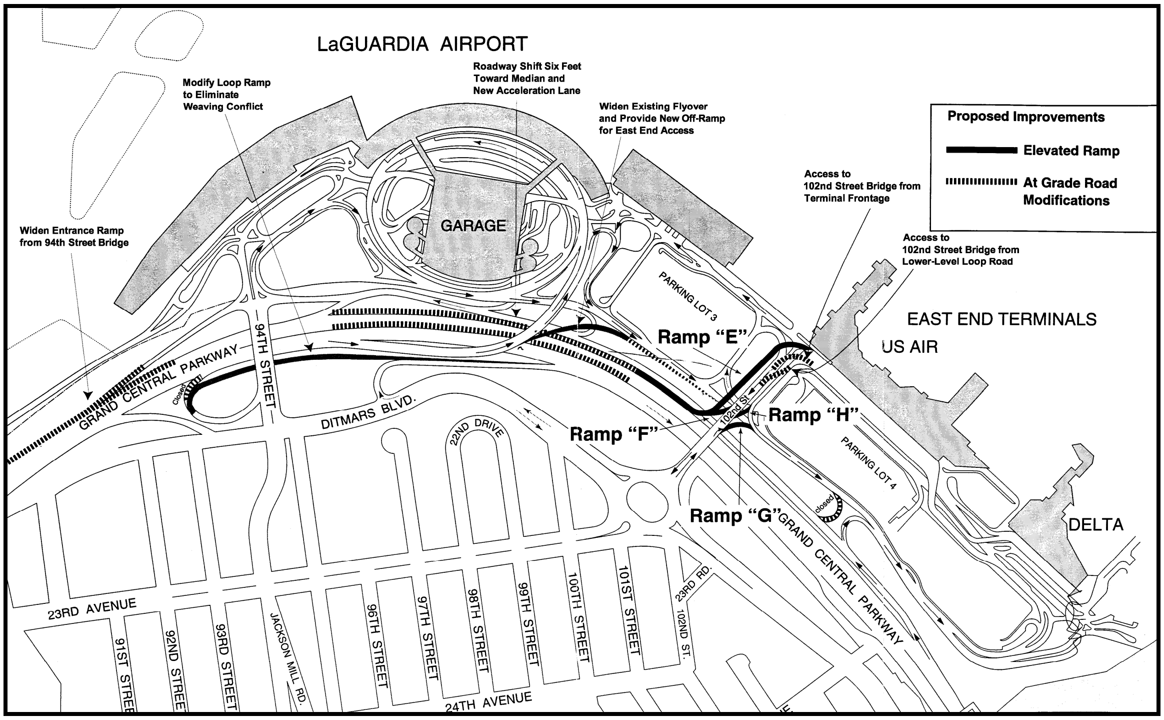
It should also be noted that other roadway operational deficiencies may be present with respect to the on-airport roadway network that were not identified under critical link analysis. Roadway segments in proximity to terminal frontages, which are frequently controlled by traffic signals, were not analyzed in that they present a more localized condition rather than a representation of the functionality of the on-airport roadway network.

Under forecasted 2015 AM peak hour traffic demand, it is projected that two additional critical segments would operate in LOS D, the north service road and CTB parking exit weaving area (Segment 1) and the loop ramp to the east end terminals (Segment 3). Under 2015 PM peak hour demand, operations on the inbound loop ramp from the north service road (Segment 7) will deteriorate to LOS F, while the east end terminals access and recirculation roadways (Segments 3, 5 and 6) will operate in LOS D.

Under forecasted 2025 AM peak hour traffic demand, operations on the inbound loop ramp from the north service road (Segment 7) will deteriorate to LOS E while the CTB parking exit weaving area (Segment 1) and the loop ramp to the east end terminals (Segment 3) would remain at LOS D. Projected 2025 PM traffic conditions indicate that in addition to the deficiencies noted above for Segment 7, a portion of the east end access roadway would deteriorate to LOS E (Segment 6) while other east end access segments would remain at LOS D (Segments 3 and 5).

Illustrated on Exhibit III.4-3 are improvements that the Port Authority has planned to facilitate ingress and egress to the east end terminals. A branch ramp to be constructed from the GCP eastbound flyover ramp leading to the east end would significantly reduce traffic demand and thus the LOS deficiencies associated with the short loop ramp (Segment 3) noted above. In addition, several ramps are planned to be constructed to and from the recently redecked 102nd Street Bridge. An inbound ramp from the 102nd Street Bridge would connect with the recirculation ramp from departures level of the US Airways Terminal, leading to the east end access roadway and the Delta Terminal (Segment 6), outbound ramps would be constructed from the bridge and the departures level of the US Airways Terminal connecting directly to the Grand Central Parkway, connections would also be provided from the US Airways arrivals frontage and loop roadway to the 102nd Street Bridge and the outbound loop ramp to the North Service Road would be closed. The direct ingress and egress that these improvements will provide will reduce recirculation and thus traffic levels and improve operations on certain east end access roadways (Segments 4 and 5). In addition, the elimination of the weaving section leading to the flyover from eastbound Grand Central Parkway, as described in Section III.6, will increase traffic access capacity to the flyover.

Exhibit III.4-3
LGA - Proposed Access Improvements



III.4.4 On-Airport Roadways – Conclusions and Recommendations

Based upon the above analysis and findings, the following summary recommendations are proposed.

Airport Gateway Links

The primary deficiency related to airport gateway links concern the loop ramp from the North Service Road (Segment 7). Capacity of this ramp needs to be increased, either through increasing its design speed or making it a two lane ramp. Both options are precluded by its location and proximity to the roadway split for the Delta and US Airways terminals. Possibly, its capacity could be enhanced in conjunction with closure of the adjacent outbound loop ramp. Issues related to the off-airport weaving area at the beginning of the inbound flyover from the eastbound Grand Central Parkway are discussed in Section III.6.

Circulation Roadways

Most deficiencies noted with the on-airport circulation roadways (Segments 3 and 5) will be mitigated by planned Port Authority improvements discussed above. The deficiencies related to the one segment of east end access roadway (Segment 6) and the fact that all travel to east end terminals must use it will remain, but it will operate below capacity through 2025 (LOS E). As noted above, deficiencies may occur or grow worse at signal controlled intersections, adversely affecting roadway links near the terminal frontages, but these deficiencies do not reflect significant on-airport roadway capacity deficiencies and would be addressed by local modifications.

III.4.5 Terminal Frontage Roadways

There are four separate terminal buildings at LaGuardia Airport. Each airline terminal frontage at LaGuardia Airport consists of separate arrivals and departure roadways, except Terminal A (Delta Shuttle) with a combined arrivals and departures frontage roadway. All of the separate arrivals frontage roadways generally function as "segmented" curb spaces while departures frontage roadways generally provide "common" curb spaces.

III.4.6 Terminal Frontage Capacity and Operations

A summary of the existing terminal frontages at LaGuardia Airport is shown in Table III.4-2. All of the LaGuardia terminals have standard one or two arrivals and departures roadways, with the exception of Terminals A and B, which have a combined arrivals/departures roadway and three arrivals roadways, respectively. The Central Terminal Building (Terminal B) provides curb spaces along both terminal frontages and through the terminal building. As a result, Terminal B provides a relatively long arrivals and departures frontage. Terminal A currently provides double curb loading/unloading lanes for passenger cars on the combined arrivals/departures roadway and Terminals C and D provide double parking lanes for cars on the departures roadways. As such, the increased effective curb lengths are reflected in Table III.4-2. Terminal B frontages consist of the longest capacity of arrivals frontage (1,371 feet) and departures frontage (1,522 feet). Future 2015 and 2025 frontage curb capacities of all LaGuardia Airport terminals are expected to be essentially the same as those of the 2004 baseline condition.

The left curb lane length of 264 feet on inner arrivals roadway for Terminal B is currently designated for "authorized vehicles" only. Some Port Authority vehicles were observed parked on this curb lane during field reconnaissance trips. Similarly, the right curb lane length of 260 feet on inner departures roadway is also restricted with the posted sign of "No Parking Except Authorized Vehicles". A small segment (98 feet) of the "NO STANDING ANY TIME" lane on the left side of inner arrivals roadway for Terminal C is reserved for US Airways employees. More importantly, nearly 700 feet of the "NO STANDING ANY TIME" lane on the outer arrivals roadway of Terminal C is currently utilized by a mix of passenger cars and limousines. A separate limo curb length of 244 feet for "Reserved Parking for Elite Limousine" exists on the inner arrivals roadway. These restricted curb spaces are not included in the available frontage curb supply shown in Table III.4-2.

The critical peak hours of frontage use at each LaGuardia Airport terminal were identified from the 2004, 2015 and 2025 design day airline schedules. As a result, the start of the frontage curb peak hours for various LaGuardia Airport terminals under the 2004 and 2015/2025 conditions are identified as follows:

	Arrivals		Departures	
Terminal	2004	2015/2025	2004	2015/2025
A	Varies	7:10 AM	5:50 AM	5:50 AM
B	10:00 PM	6:10 PM	5:00 AM	5:40 AM
C	8:10 AM	7:00 PM	7:10 AM	7:30 AM
D	10:10 PM	8:30 PM	5:00 AM	5:50 AM

Comparisons of the available curb frontage capacity and peak hour usage at each LaGuardia Airport terminal revealed the extent of deficiency or surplus under the 2004, 2015 and 2025 passenger demand conditions, as shown in Table III.4-3.

Table III.4-2
LGA Airport Frontage Curb Capacity Summary

	Available Curb (feet)			
Frontage Curb	**Terminal A ***	**Terminal B**	**Terminal C**	**Terminal D**
Arrivals				
Car/Limo/Car Service	432	568	505	623
Taxi	245	308	417	---
Shared Ride/Shuttles	144	200	121	36
Bus	156	295	276	340
Total		**1371**	**1319**	**999**
Departures				
Car/Limo/Taxi	---	1522	498	656
Shared Ride/Shuttles	---	---	244	---
Bus	---	---	76	41
Total	**977**	**1522**	**818**	**697**

* Terminal A frontage is used for both arrivals and departures passengers.

Table III.4-3
LGA Airport Frontage Analysis Summary

Terminal	Frontage Road	Available Frontage (feet)			Required Frontage (80%) (feet)			Theoretical Surplus (Deficit) (feet)		
		2004	2015	2025	2004	2015	2025	2004	2015	2025
A	Cars/Limos/Car Service	432	432	432	400	400	500	32	32	(68)
	Taxis	245	245	245	75	100	100	170	145	145
	Shared Ride/Shuttles	144	144	144	120	120	160	24	24	(16)
	Buses	156	156	156	55	110	110	101	46	46
	Arrivals/Departures	**977**	**977**	**977**	**650**	**730**	**870**	**327**	**247**	**107**
B	Cars/Limos/Car Service	568	568	568	1200	1525	1700	(632)	(957)	(1132)
	Taxis	308	308	308	125	175	175	183	133	133
	Shared Ride/Shuttles	200	200	200	200	280	320	0	(80)	(120)
	Buses	295	295	295	110	110	110	185	185	185
	Arrivals	**1371**	**1371**	**1371**	**1635**	**2090**	**2305**	**(264)**	**(719)**	**(934)**
	Cars/Taxis	1522	1522	1522	610	795	875	912	727	647
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures	**1522**	**1522**	**1522**	**610**	**795**	**875**	**912**	**727**	**647**
C	Cars/Limos/Car Service	505	505	505	550	500	550	(45)	5	(45)
	Taxis	417	417	417	75	75	75	342	342	342
	Shared Ride/Shuttles	121	121	121	120	120	120	1	1	1
	Buses	276	276	276	55	55	55	221	221	221
	Arrivals	**1319**	**1319**	**1319**	**800**	**750**	**800**	**519**	**569**	**519**
	Cars/Taxis	498	498	498	325	300	300	173	198	198
	Shared Ride/Shuttles	244	244	244	80	80	80	164	164	164
	Buses	76	76	76	55	55	55	21	21	21
	Departures	**818**	**818**	**818**	**460**	**435**	**435**	**358**	**383**	**383**
D	Cars/Limos/Car Service	623	623	623	650	700	750	(27)	(77)	(127)
	Taxis	0	0	0	75	100	100	(75)	(100)	(100)
	Shared Ride/Shuttles	36	36	36	160	160	160	(124)	(124)	(124)
	Buses	340	340	340	55	55	55	285	285	285
	Arrivals	**999**	**999**	**999**	**940**	**1015**	**1065**	**59**	**(16)**	**(66)**
	Cars/Taxis	656	656	656	325	475	475	331	181	181
	Shared Ride/Shuttles	0	0	0	80	80	120	(80)	(80)	(120)
	Buses	41	41	41	55	55	55	(14)	(14)	(14)
	Departures	**697**	**697**	**697**	**460**	**610**	**650**	**237**	**87**	**47**

Note: The deficits indicated are theoretical only. The large deficits indicated are physically unattainable. Operational considerations must be studied to rectify the frontage shortages.

Table III.4-3 shows that there is insufficient total frontage capacity on the arrivals roadway for Terminal B under 2004 baseline, and for Terminals B and D under projected 2015 and 2025 passenger demand conditions. Under existing conditions, a substantial shortage of frontage curb space for passenger cars occurs at the Terminal B arrivals roadway. This shortage will nearly double by 2025. A slight frontage deficit of 45 feet for passenger cars also exists at the arrivals roadway of Terminal C. There also are deficits of curb space for cars, taxis and shared ride/shuttle vehicles on arrivals roadway of Terminal D under existing and future demand levels and for shared ride/shuttle vehicles and buses on the departures roadway. A redistribution of available frontage curb supply on arrivals roadways of Terminals B, C and D is necessary to accommodate the actual frontage demand at each terminal.

III.4.7 Terminal Frontage Roadways – Conclusions and Recommendations

Results of foregoing frontage analyses indicated that Terminals B and D do not have sufficient frontage curb capacity to accommodate the arrivals passenger flight demands between 2004 and 2025. A slight curb space deficit for passenger cars is expected on arrivals roadway of Terminals A, C and D. A frontage shortfall is also indicated for limousines and courtesy shuttle vans at Terminals A, B and D. The possible redistribution of available frontage curb supply is recommended to mitigate the apparent deficits as follows:

- For Terminal A, no reserve capacity is available on any vehicle frontages to alleviate a slight deficit of 68 feet for passenger cars and 16 feet for permittee shared ride/shuttle van curb space.

- For Terminal B, the existing passenger car loading/unloading curb length of 308 feet on the middle arrivals roadway should be operated as a double lane to increase the frontage space by nearly 200 feet. Although approximately 300 feet of existing taxi and bus curb space can be converted to passenger car loading/unloading space, insufficient reserve capacity is available to satisfy the entire arrivals deficit.

- For Terminal C, the existing taxi lane length of 326 feet in the middle of inner arrivals roadway should be reduced to 250 feet and 86 feet of taxi lane should be designated for passenger car loading/unloading space. Approximately 244 feet of the existing “Reserved Parking for Elite Limousine” curb space on the inner departures roadway also should be designated to accommodate other permittee shared ride/courtesy shuttle van service.

- For Terminal D, the existing bus stop length of 96 feet on the inner arrivals roadway needs to be converted to passenger car loading/unloading space and 132 feet of bus stop on the outer arrivals roadway should be converted to permittee shared ride/courtesy shuttle van service. In addition, the existing outer arrivals roadway may be modified to provide a new taxi lane length of 100 feet

III.5 On-Airport Vehicle Parking Capacity

III.5.1 On-Airport Vehicle Parking Facilities

An inventory of existing short- and long-term parking facilities at LaGuardia Airport was obtained from the on-airport capacity database. For the purpose of this study, the actual public parking capacity based on current operating conditions is considered to represent the baseline condition. The on-airport parking evaluation is directed towards the public parking needs of airline passengers and airport employees. The assessment of tenant parking at the various individual properties is not addressed in this study. Public parking is primarily intended for airline passengers and their meeters-greeters and is classified as long-term (longer than 24 hours) and daily (24 hours or less) spaces. Locations of the existing on-airport parking facilities are shown on Exhibit III.5-1. A total supply of 9,145 parking spaces was identified at eight parking facilities located throughout LaGuardia Airport (see Table III.5-1).

Exhibit III.5-1
LGA – Parking Facilities

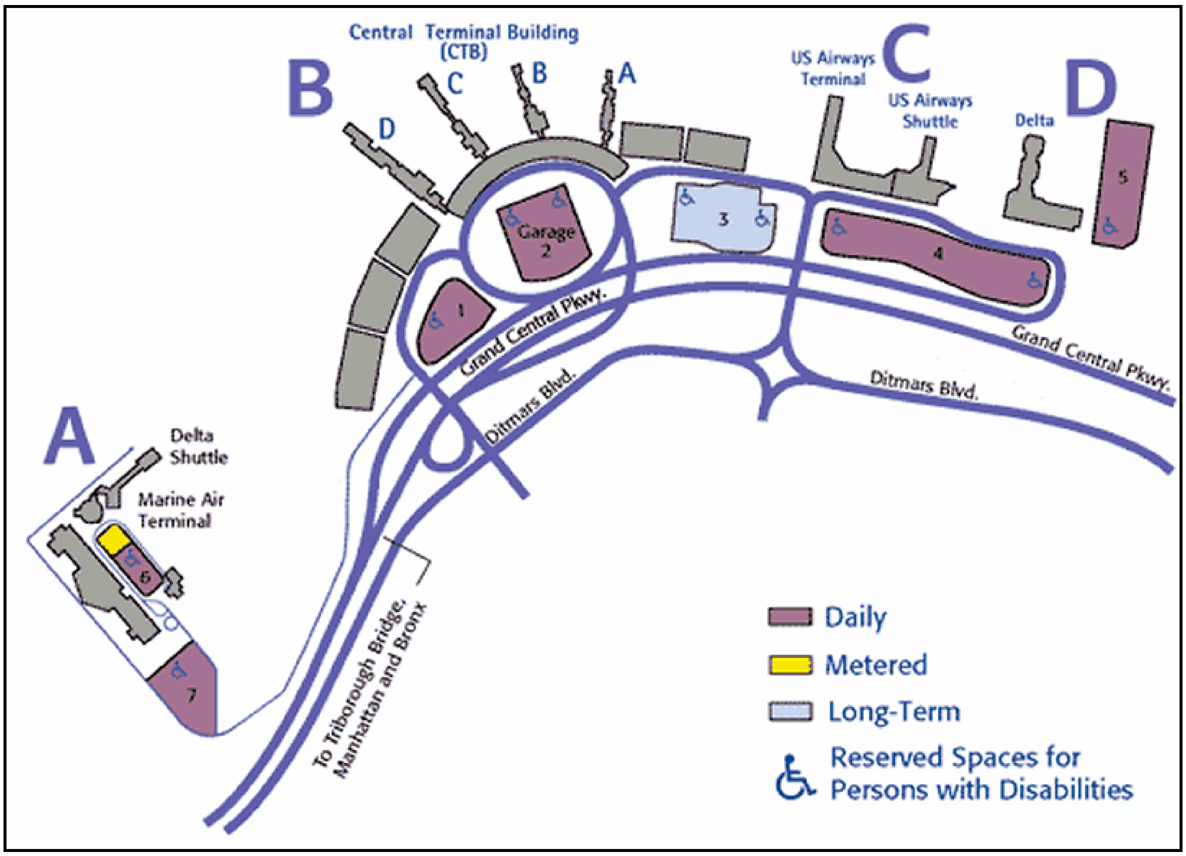


Table III.5-1
LGA Parking Summary

Parking Lot	Parking Color	Terminal	Supply 2004	Supply 2015	Supply 2025	Parking Occupancy 2004	Parking Occupancy 2015	Parking Occupancy 2025	Surplus (Deficit) 2004	Surplus (Deficit) 2015	Surplus (Deficit) 2025
1		Terminal B Daily Parking	397	397	397	111	136	154	286	261	243
2		Terminal B Daily Parking Garage	2,902	2,902	2,902	1,973	2,409	2,736	929	493	166
3		Long-Term Parking	925	925	925	925	1,065	1,185	0	(140)	(260)
4		Terminal C Daily Parking	1,381	1,381	1,381	1,174	1,153	1,223	207	228	158
5		Terminal D Daily Parking	857	857	857	677	785	866	180	72	(9)
6		Terminal A Daily Parking	177	177	177	152	171	191	25	6	(14)
7		Terminal A Daily Parking	270	270	270	84	94	105	186	176	165
		SUB-TOTAL	6,909	6,909	6,909	5,096	5,813	6,460	1,813	1,096	449
10E		Employee Parking (Marine Air)	2,236	2,236	2,236	1,744	2,007	2,234	492	229	2
		TOTAL (LGA)	9,145	9,145	9,145	6,840	7,820	8,694	2,305	1,325	451

On-airport parking facilities provide a total short-term daily parking capacity of 5,984 spaces at six facilities. Parking Lots 1 and 10E provide long-term parking (925 spaces) and employee parking (2,236 spaces), respectively. Daily parking at Terminal B parking garage (Lot 2) and surface Lots 1, 4, 5, 6 and 7 can be used for up to 30 days at the posted daily rate of $30.00 for each 24-hour period. The long-term reduced rate parking is available at Lot 3 only for $30.00 for each of the first two days and $5.00 for each 8-hour period or part thereafter.

III.5.2 On-Airport Parking Capacity and Operations

Parking occupancy data for all on-airport parking facilities were compiled by Five Star Parking in August 2005 and March 2006. The higher parking occupancy data from either month was used to represent the current baseline design-hour parking demand at LaGuardia Airport, as summarized in Table III.5-1. The total airport parking supply is sufficient to accommodate baseline on-airport parking demand, however, long term Lot 3 is filled to capacity. On an airport-wide basis, there is a sufficient supply of total public parking spaces throughout the 2015 and 2025 design years. Although the Terminal B garage remains underutilized, surface parking Lots 4 and 5 fill to their capacity with overflow into the adjacent long-term Lot 3. For projected passenger conditions, a parking deficit will occur in long-term Lot 3 under 2015 and 2025 conditions and Lots 5 and 6 will have slight deficits under 2025 conditions. Lots 1 and 7 have excess capacity to meet the future 2015 and 2025 passenger demands at design hour occupancy below 40%.

III.6 Airport Access/Off-Airport Roadway Capacity

III.6.1 Introduction

Roadway access to LaGuardia Airport, located in northern Queens, New York on Flushing Bay, is relatively simple, although its compact land area and limiting confines present challenges for landside access. The primary land access is provided by the adjacent Grand Central Parkway (GCP) and the airport is integrated with its surrounding neighborhood as access from local streets is straightforward. In contrast to the other two major New York metropolitan airports operated by the Port Authority, no rail access is available. However, express and local bus service is available and the taxi mode share is highest at LaGuardia Airport given its relatively close location to Manhattan.

III.6.2 Roadway Access

The Grand Central Parkway is an eight lane roadway adjacent to LaGuardia Airport. It connects in the west to the Brooklyn-Queens Expressway (I-278) and the Triborough Bridge leading to the Boroughs of Manhattan and the Bronx. To the east it runs a winding route to Long Island, intersecting with several major limited access highways, including the Whitestone Expressway (I-678) leading to the Bronx-Whitestone Bridge and the Long Island Expressway (I-495). Local street connections to and from the south are provided by 94th and 102nd Street Bridges and to the west by on-airport roadways to Ditmars Boulevard and Astoria Boulevard.

Certain inbound and outbound movements between the airport and the Grand Central Parkway involve the use of local streets or facilities also used by non-airport related traffic (see Exhibit III.4-1). Inbound trips to the airport (except to the Marine Air Terminal) from the eastbound GCP use the direct flyover ramp and inbound trips from the westbound GCP use the slip ramp to the North Service Road. Outbound trips from the airport to the westbound GCP use one of two slip ramps on either side of the 94th Street Bridge. However, outbound trips to the eastbound GCP must cross either the 94th or 102nd Street Bridge and use one of the two closely spaced eastbound GCP on-ramps. Inbound trips to the Marine Air Terminal from the eastbound GCP use the off-ramp to Astoria Boulevard South, inbound trips from the eastbound Brooklyn-Queens Expressway (BQE) use the off-ramp to the 94th Street Bridge and inbound trips from the westbound GCP use the off-ramp to Ditmars Boulevard. Outbound trips from the Marine Air Terminal to the westbound GCP proceed west on Astoria Boulevard North to the first on-ramp and across the Ditmars Boulevard Bridge to 23rd Avenue and Ditmars Boulevard to reach the eastbound GCP on-ramp.

Commercial traffic is prohibited on the GCP except for a short segment between the Triborough Bridge and BQE on which single unit trucks have been recently allowed. Trucks can enter and leave LaGuardia via the 94th Street Bridge and proceed south to Astoria Boulevard, an east-west truck route.

As noted in Section I-6, congested conditions on the limited access highways in the area are generally caused by bottlenecks, either physical such as at major interchanges or by oversaturated segments that propagate congestion upstream. Congestion on the Grand Central Parkway eastbound in this area often begins at its interchange with the Whitestone Expressway to the east and then propagates westward to the LaGuardia Airport area. Westbound congestion on the GCP often begins at its interchange with the Brooklyn-Queens Expressway to the west. Overall, however, congestion within the section of the GCP adjacent to the airport is not as prevalent as in sections further east. Annual Average Daily Traffic (AADT) is approximately 180,000 vehicles per day on the eight lane section of the Grand Central Parkway in the vicinity of the airport. Further east, AADT on the eight lane section of the GCP east of the Long Island Expressway exceeds 225,000 vehicles per day. Traffic demand is expected to increase by approximately 10 per cent on the Grand Central Parkway over the 20 year planning horizon as forecast by the regional traffic demand forecasting model maintained by the New York Metropolitan Transportation Council.

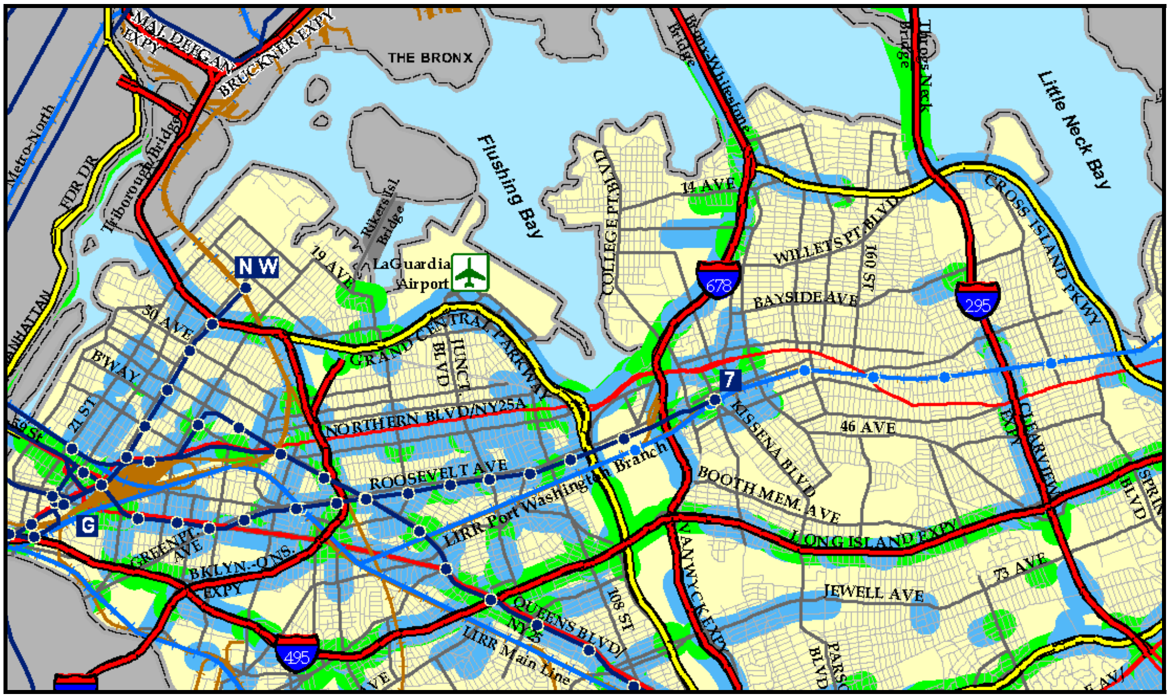
Illustrated on Exhibit II.6-1 is the roadway and transit network in the vicinity of LaGuardia Airport. Also shown is the utilization of roadway capacity projected to occur over the AM peak period in the year 2030 by the New York Metropolitan Transportation Council. Most major roadways in the vicinity of the airport are indicated to operate at least over 80 per cent of capacity during the AM peak period with segments of the Grand Central Parkway projected to operate over 100 per cent of capacity. Therefore, the level and duration of congestion on the off-airport roadway network serving LaGuardia Airport is expected to be significant in the future during weekday peak traffic periods.

III.6.3 Bus Access

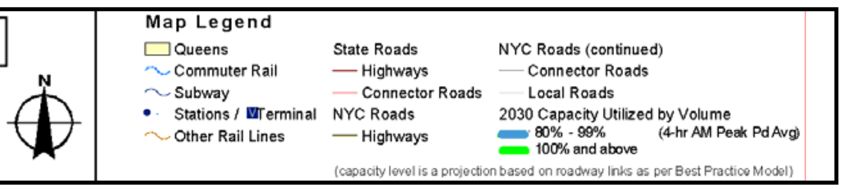
Several bus transit options are available for travel to and from LaGuardia Airport. Direct service to and from Manhattan is available on the New York Airport Express Bus with stops in Manhattan at the Port Authority Bus Terminal, Grand Central Station and Pennsylvania Station. Service frequency is generally every 20 minutes. Local transit service is provided to and from LaGuardia Airport by the Q33, Q47, Q48 and M60 bus lines and offer connections to subway stations. Based upon the responses to the Departing Air Passenger Survey, these services are used by as many air passengers as the express bus.

Baseline 2004 and future forecast usage of express bus service to LaGuardia Airport was compared to service capacity levels. On a daily basis, assuming the mode share derived from the Departing Air Passenger Survey, it was estimated that less than 50 per cent of the capacity of the airport express bus service is used today. Sufficient capacity should therefore be available to meet forecast demand in 2025.

Exhibit III.6-1
Off-Airport Roadway Operations



Source: New York Metropolitan Transportation Council



III.6.4 Off-Airport Transportation Improvements

Table III.6-1 provides a description and status of off-airport transportation projects in the vicinity of or directly related to LaGuardia Airport that are in some stage of study or have been listed as potential projects. As noted in Section III.4, a capacity limiting element of the two lane flyover from the eastbound GCP is the weaving section at its base. The New York State Department of Transportation has scheduled an elimination of this weave by connecting the two eastbound on-ramps on either side of the 94th Street Bridge (see Exhibit III.4-3), thus forming one on-ramp. The transition to the two lane flyover can then be properly designed as a two lane off-ramp to fully utilize the flyover capacity. The Port Authority has identified the possibility of establishing a Bus Rapid Transit/Taxi priority lane on the Grand Central Parkway, but no study has been initiated. Although it was studied in the 1990's there is no current consideration of providing rail access to LaGuardia Airport through an extension of the New York City subway.

III.6.5 Conclusions

The physical setting of LaGuardia Airport presents constraints in landside access and limitations for options to develop significant infrastructure improvements. Some improvement can be realized by the interchange modification at 94th Street and by the on-airport modifications planned in conjunction with the flyover and the additional ramps to be constructed to and from the 102nd Street Bridge, as discussed in Section III.4. Although the Grand Central Parkway is less frequently congested in the immediate airport area, more problematic areas are found on the parkway to the east and west and on the Brooklyn-Queens Expressway to the west.

Table III.6-1
LGA - Off-Airport Transportation Improvements

Project	Description	Sponsors	Benefits	Status
Airport Ferry	N/A	PANYNJ	N/A	N/A
BRT/Taxi Priority Lane to Airport	N/A	PANYNJ	Reduce airport access delay for transit and taxi passengers	Not funded in current capital program
Grand Central Parkway Interchange Improvement and Flyover Reconstruction	Relocate on-ramp, eliminate on/off-ramp weave, bridge rehabilitation	NYSDOT	Increase flyover ramp capacity to airport	2006-2007 construction

IV. CAPACITY ASSESSMENT

Newark Liberty International Airport

IV.1 Airfield Capacity

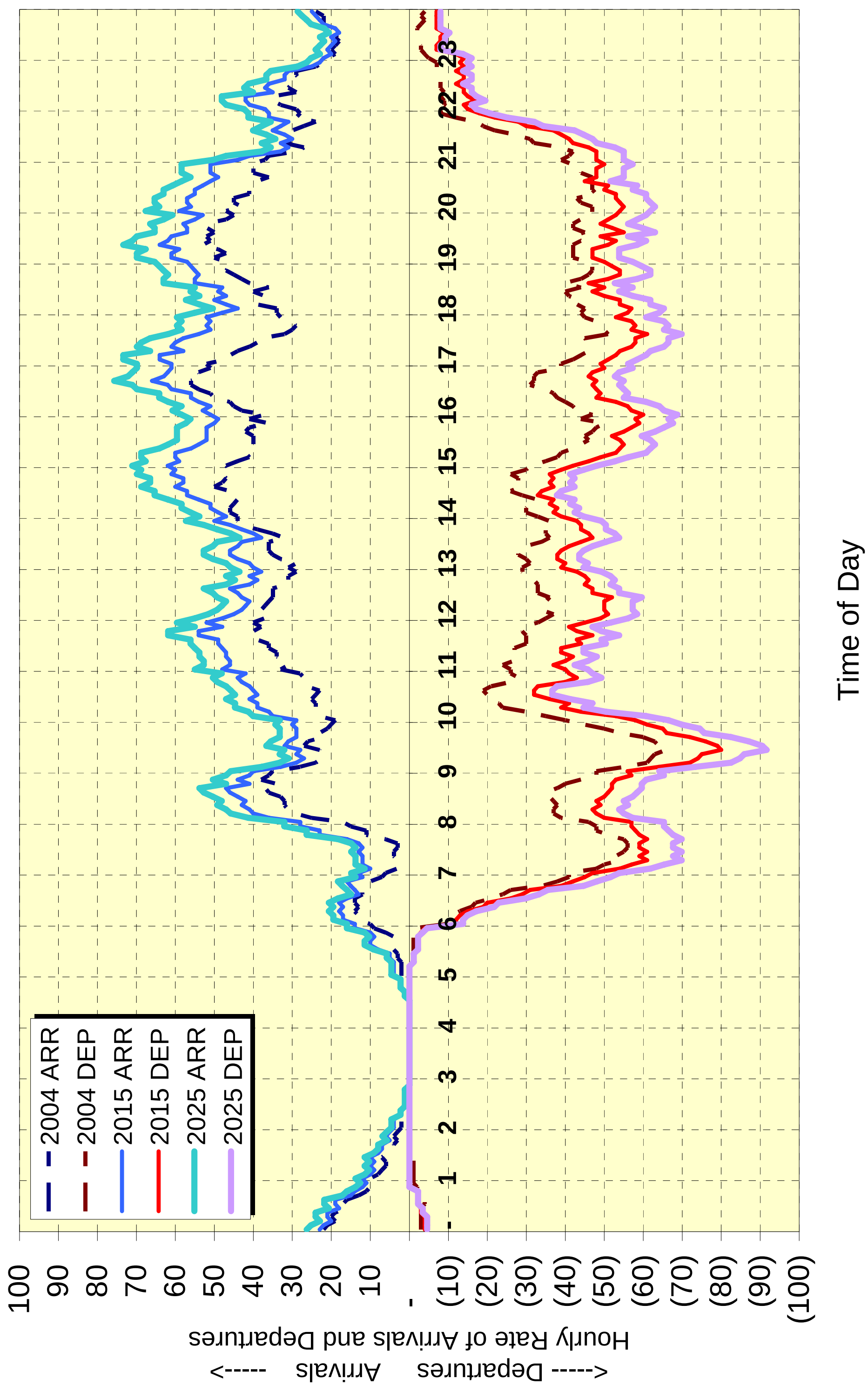
The analysis of runway capacity for EWR was conducted as described in Section I, using the runway queue and delay model. The daily distribution of demand was derived from the forecast. CATER and ASPM databases were examined to determine runway capacity rates, runway configurations and existing (2004) delay levels. CATER data was also examined to determine the maximum lengths of runway queues. These lengths of queues were compared to the physical configuration of the taxiways themselves to determine whether the capacity of the taxiway system to manage departure runway queue delays. The model was calibrated against delay levels for 2004 in the FAA ASPM database. Future delay levels for future demand were derived using the model. Finally, capacity values required to have delays at existing levels were computed to define a level of future runway capacity need.

IV.1.1 Future Demand Profiles

Exhibit IV.1-1 shows the existing and forecast (2015 and 2025) hourly rate of demand (evaluated 60 minutes ahead every five minutes on a rolling basis). As shown, existing demand has a peak demand of 55 arrivals per hour and 63 departures per hour. This is expected to grow to 65 arrivals and 80 departures per hour by 2015, and to 76 arrivals and 92 departures by 2025.

As described in the forecast report, this growth is a combination of both domestic and international growth by Continental. In addition, low-cost carriers are forecast to have an increasing market share. International growth also occurs with other airlines. The largest international market segment is Western Europe. The fastest growing international markets are Latin America, Asia and the Middle East. This forecast creates a growth trend that continues the current patterns of peak aircraft arrival and departure activity periods into the future.

Exhibit IV.1-1
EWR - Forecast Rate Of Hourly Demand



IV.1.2 Existing Runway Configurations

Exhibit IV.1-2 shows the most frequently used runway configurations used at EWR. Essentially, the operation of the primary arrival and primary departure runway establishes the airspace configuration and establishes the secondary arrival and departure runways that are used to handle peak hour flow conditions. The annual use of each configuration was established through an examination of CATER data for 2004.

Generally, all of EWR aircraft traffic flows are variations on either a Southwest Flow Configuration (used approximately 55% of the time) and a Northeast Flow Configuration (used approximately 45% of the time). Usually all arriving aircraft are assigned to Runway 4R/22L (runway furthest from the terminal, while departures are assigned to Runway 4L/22R (the runway closest to the terminal). Runway 4L/22R also has use as a second arrival runway. CATER databases indicate that up to four peak hour arrivals will use this runway. Use of this runway reduces its capacity for departures, and thus occurs only intermittently. In addition, 4L/22R serves both as the arrival and the departure runway during nighttime hours. Runway 4R/22L has virtually no use as a departure runway.

Runway 11/29 has very occasional use as an arrival runway. Its use is limited by its two intersections with the main parallel runways. Runway 11 is used more frequently for departures during Northeast flow. This use shortens taxi times and does not contribute to overall departure capacity, again due to the two runway intersections.

Exhibit IV.1-2
EWR Runway Configurations

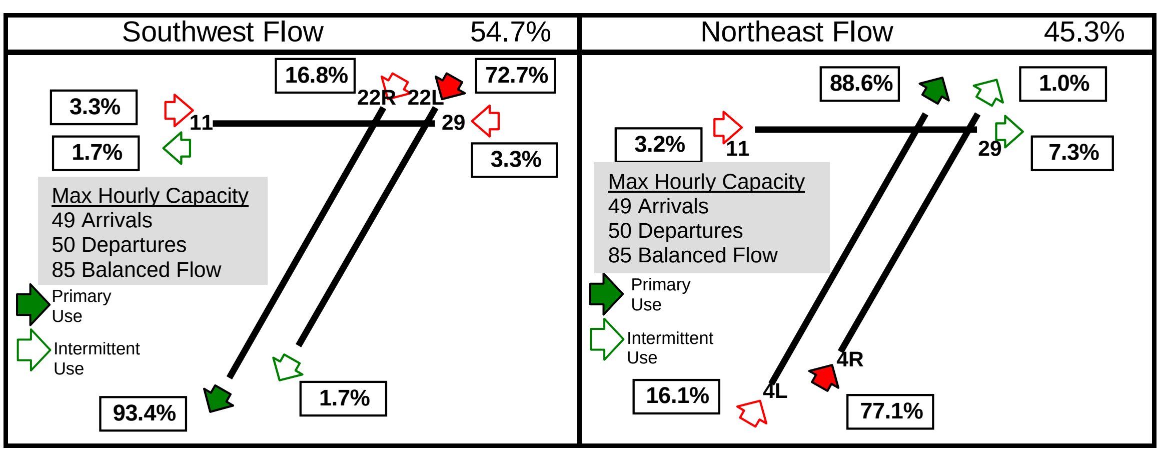


Table IV.1-1
EWR - Average Annual Capacity Rates

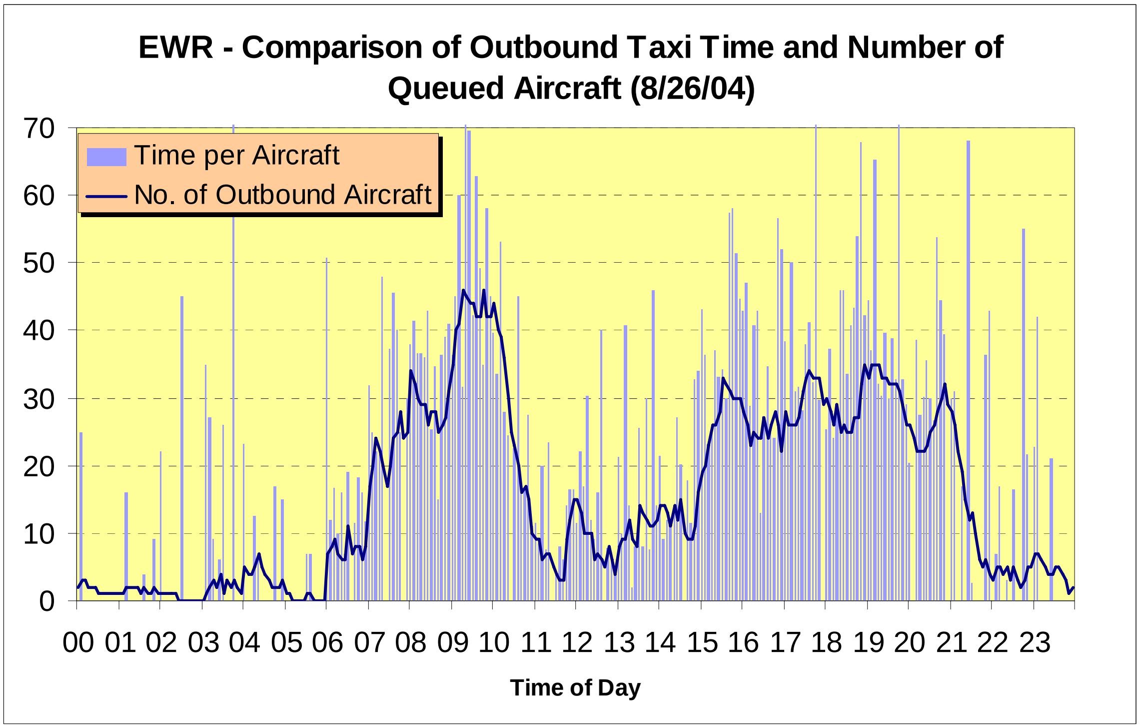
	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	42	43	49	40	38	50
5 Minute	3.5	3.5	4.1	3.3	3.2	4.2
20 Minute	14.0	14.2	16.3	13.3	12.7	16.7

The analysis of CATER and ASPM data determined the average annual runway capacity rates shown in **Table IV-1**. The balanced capacity condition reflects use of single arrival and single departure runway. The rates shown reflect an annual average of weather conditions that include both Visual Flight Rules weather, when capacity rates are higher, and IFR weather conditions when capacity rates are lower, and the use of second runway for arrivals is more limited. The table shows capacity values expressed in three different time intervals. The hourly rate is provided since it is easiest to comprehend. The twenty minute rates are used by the queue model to plan the utilization of airfield capacity while the five minute rates are used for the actual delay calculations. The model operates in a five minute time-slice mode where capacity and delay calculations are updated every five minutes for a twenty-four hour day.

IV.1.3 Existing Taxiway Capacity

Exhibit IV.1-3 shows the taxi time for each aircraft (bars) and the number of aircraft taxiing between the gate and runway for a typical busy, good weather day in 2004. As shown, during the peak departure hours of 9AM to 11AM, 45 aircraft are between the gates and runways with most aircraft having taxi times in excess of 40 minutes and a few having taxi times in excess of 50 minutes. During the afternoon hours (between 4PM and 9 PM, generally 25 to 35 aircraft are taxiing between gates and runways with most taxi times within the range of 30 to 40 minutes.

Exhibit IV.1-3
EWR - Typical Outbound Taxi Time Analysis



IV.1.4 Existing and Future Delay Analyses

Table IV.1-2, Exhibits IV.1-4 and **IV.1-5** show existing and forecast arrival delays for EWR. As shown, existing arrival delays per aircraft levels will more than triple and will increase by two and a half times for departures by 2015, with total aircraft activity only increasing by approximately 28 percent. By 2025, arrival delays will increase six fold, while departure delays will to four and half times existing levels.

Table IV.1-2
EWR - Summary Of Existing And Future Aircraft Delays
(In Minutes)

	Arrival Delays			Departure Delays		
	2004	2015	2025	2004	2015	2025
Average	19	61	124	19	49	92
Peak Hour	56	150	270	43	67	115

Exhibit IV.1-4
EWR - Existing And Future Arrival Delays

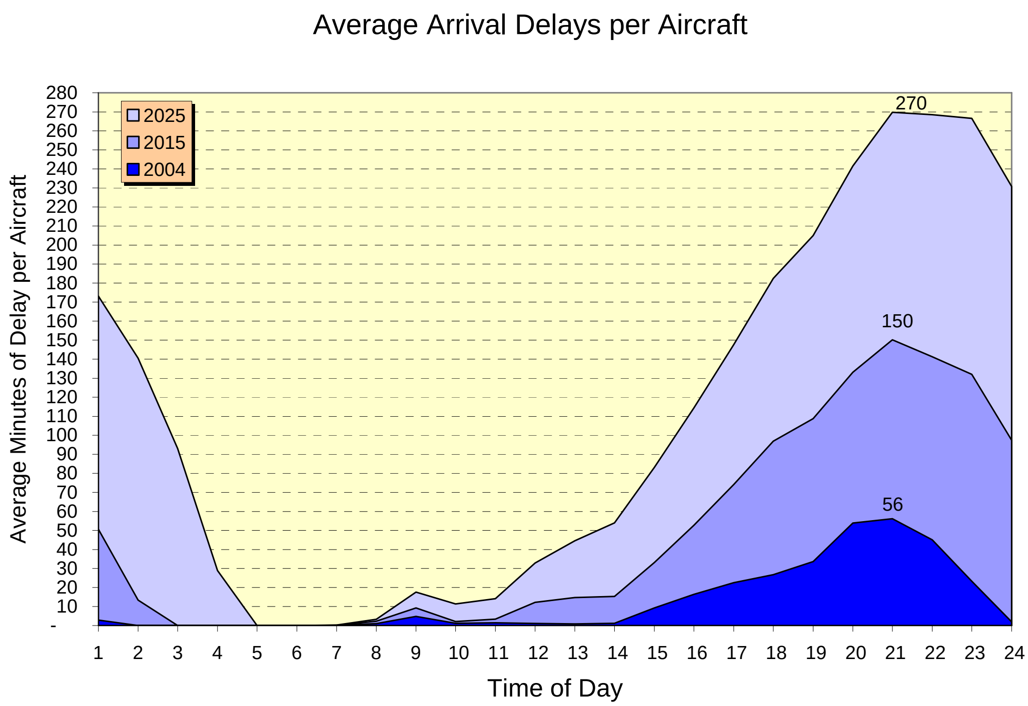
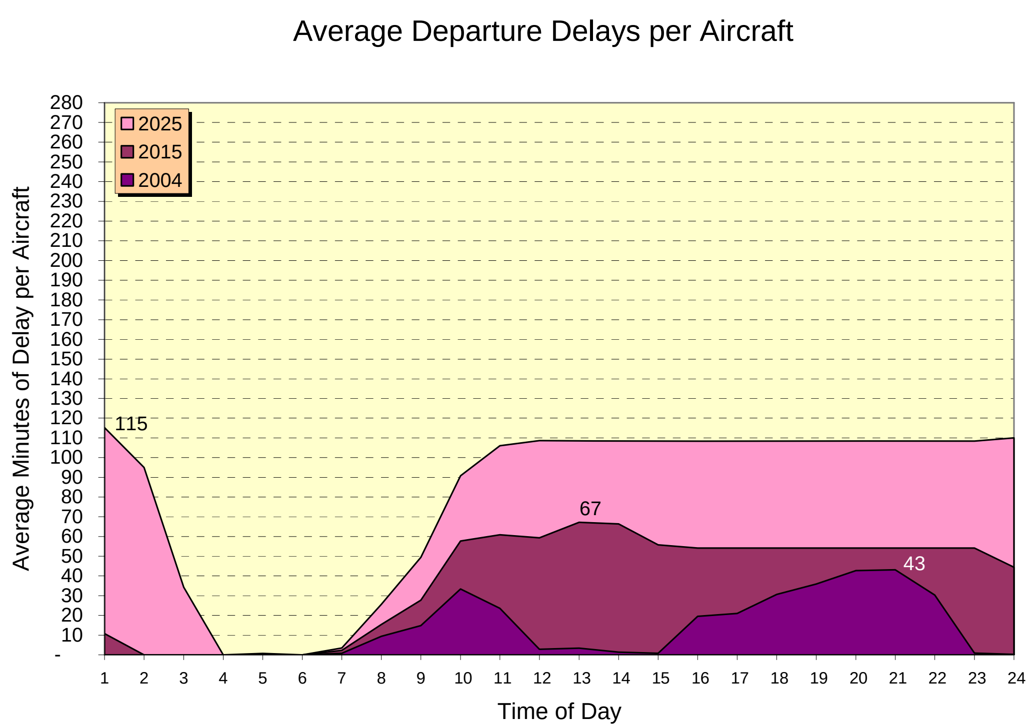


Exhibit IV.1-5
EWR - Existing And Future Departure Delays



Existing delay levels computed by the queue model compare favorably to those reported by the FAA ASPM database. The queue model reported 18.5 minutes of arrival delay while the FAA ASPM database recorded an average annual arrival delay of 18.9 minutes. The queue model reported 19.4 minutes of departure delay, which compares to 20.1 minutes per aircraft reported by the FAA ASPM database.

Most aircraft delays will occur in the afternoon and evening. By 2015 peak hour arrival delays will quadruple while peak hour departure delays will increase by 55 percent. Departure delays will increase more slowly than arrival delays since the arrival capacity constraint delays and meters the flow of aircraft to the departure runways. By 2025 the flow arrival aircraft would continue past 2AM and with peak hour delays exceeding four hours.

More detailed reporting of aircraft delay modeling and queuing needs is presented in Appendix A.

IV.1.5 Future Runway and Taxiway Capacity Needs

The queue model was run iteratively to establish the level of runway capacity required to achieve existing delay levels. **Table VI.1-3** shows existing and forecast runway capacity needs for balanced and peak directional flow conditions. Key needs that define level of service are shown in green.

Table VI.1-3
EWR - Existing and Forecast Runway Capacity Requirements

		2004	2015	2025
Balanced Flow				
	Arrivals	42	48	60
	Departures	43	48	60
	Total	85	96	120
Arrival Preference				
	Arrivals	49	60	67
	Departures	40	40	40
	Total	89	100	107
Departure Preference				
	Arrivals	38	38	38
	Departures	50	60	67
	Total	88	98	105

Source: Landrum & Brown Analysis

Runway capacity levels for 2015 need to increase by approximately 15 to 20 percent from existing levels. To handle 2015 demand at existing delay levels, EWR needs to achieve 48 arrivals and 48 departures per hour from two runways during a balanced mode of operation. Peak one-way flows of 60 arrivals or 60 departures need to be achieved to handle peak hour conditions.

96 operations per hour (48 arrivals and 48 departures) is likely to be the maximum achievable capacity from the two parallel runways. These rates today are achieved only during optimum conditions. Additional capacity to handle peak directional flows – an additional 12 arrivals or 12 departures per hour (for a total of 60 arrivals or 60 departures per hour) could come from Runway 11/29. However, this level of utilization is not likely within the current airspace configuration between EWR and Teterboro Airport (TEB). Currently, Runway 11/29 is used up to approximately 20 percent of its capability in peak periods. This utilization needs to increase to approximately 50 percent.

In the event that existing runway utilization rates cannot be increased to 96 operations per hour, the taxiway system needs an addition 0.8 miles (4,000 feet) of taxiway or equivalent hold pad space to accommodate an additional 15 aircraft in the departure runway queues. This additional length accommodates a total departure runway queue of 35 to 50 aircraft with another 10 to 15 aircraft in the gate areas taxiing towards the runways.

By 2025, the runway capacity need is for 60 arrivals and 60 departures per hour, with peak single direction flows of 67 arrivals or 67 departures per hour. The airport needs two fully airspace independent parallel runways, plus a third runway such as Runway 11/29 to accommodate peak flow conditions to accommodate this level of activity.

IV.2 Gate Utilization

Please refer to Appendix B for gate charts depicting utilization for planning years 2004 & 2015

IV.3 Terminal Capacity

This section contains a summary of the major findings of the terminal facilities assessment for EWR. The findings are presented separately for each terminal.

Each terminal's subsection contains exhibits of the 2015 Design Day scheduled seats, and a Terminal Capacity Analysis table. As discussed in Section I.3, the table shows existing and approved facilities; recommended facilities to support current and forecast levels of activity; and any surpluses or deficiencies.

The final subsection contains the annual passenger capacity estimates based on the key facilities identified in Section I.3.3.

In a number of terminals, achieving the full capacity of existing facilities will require: additional investment (not identified explicitly herein); changes in airline leases; and/or changes in operating procedures from exclusive to preferential, or common use. (For example, in order to fully utilize the check-in counter capacity in EWR Terminal A, modifications to the outbound baggage systems may be required to allow more flexibility in use. In other terminals, such as the LGA CTB, changes from exclusive to preferential or common use for gates and baggage claim may be necessary to balance utilization across the terminal.) These potential solutions would need to be studied in further detail to determine the optimum approach for addressing each terminal’s capacity constraints.

The terminal capacity analysis presented in the tables and exhibits in this section was developed by Hirsh Associates.

IV.3.1 Notes on the Terminal Analyses

Terminal-Specific Factors

Many of the planning assumptions and factors used in Section I.3 are common to all of the terminals. Others vary by terminal based on passenger, airline, and/or building characteristics. In order to easily compare the key variable assumptions used for each terminal, Table IV.3-1 summarizes these by terminal.

Domestic Baggage Claim

All of the terminals will have excess claim frontage capacity throughout the forecast period. Some of this is due to forecast schedules which are "de-peaked" relative to existing conditions. Baggage claim area per LF of frontage (approximately 31 SF/LF) is less than the recommended ratio in all terminals.

Concessions

Concessions utilization factors were also developed for individual terminals or groups of terminals with similar passenger characteristics. These are presented in Tables IV.3-2 and IV.3-3. As discussed in Section I.3, these are initial estimates of concession demand potential, and do not factor in the wide range of revenue per square foot achieved by similar concessions in different terminals. Comparisons of secure vs. non-secure concessions do not include duty free shops which may be located in either secure or non-secure areas.

Remote Parking Positions

As noted in Section I.2 (Analysis of Gate Capacity), remote parking positions were estimated only for the 2015 Design Day schedule to provide a guide to over-all airport apron requirements. These are summarized in Table IV.3-4.

Airline Space

All of the terminals are considered undersized in terms of offices in proximity to the ATO due to island configurations, terminal depth, or airline preference for locating administrative functions. When evaluating capacity, ATO offices and other office/operations space has been combined

Annual Capacity

Annual capacities have been estimated for combined domestic and international annual enplanements using the four key determinants, and for domestic or international enplanements using the secondary determinants. The key determinants are: check-in positions, SSCP lanes; contact gate frontage (NBEG); and holdrooms. Secondary determinants are domestic baggage claim frontage; international primary inspection positions; and international baggage claim frontage. These are summarized in Table IV.3-8.

Table IV.3-1
EWR - Terminal Specific Variables

	Terminals A	Terminals B	Terminals C	
Domestic ATO Counters				
Conventional Staffed Positions	35%	35%	35%	of pass. use staffed counters
	40%	35%	40%	of pk hr pass. enter in peak 30 min.
	1.5	1.5	1.0	airline exclusivity factor
Self-Service Kiosks	40%	35%	35%	of pass. use kiosks
Ticket Lobby Depth	45	45	50	feet
International ATO Counters				
Conventional Staffed Positions	N	Y	N	CUTE counters assumed?
	70%	100%	65%	of pass. use staffed counters
	29%	NA	29%	of pk hr pass. enter in peak 30 min.
	1.0	NA	1.0	airline exclusivity factor
Self-Service Kiosks	30%	NA	35%	of pass. use kiosks
Ticket Lobby Depth	45	50	50	feet
Domestic Baggage Claim				
Claim Frontage Demand	65%	65%	65%	of pass. with checked bags
	46%	47%	41%	of pk hr pass. arrives in pk 20 min.
	1.8	2.2	2.1	avg. party size
Average Claim Unit Size	170	170	190	LF/unit
International Baggage Claim				
Claim Frontage Demand	0%	90%	90%	of pass. with checked bags
	0%	50%	50%	of pk hr pass. arrives in pk 20 min.
	NA	2.1	2.3	avg. party size
	NA	1.1	1.2	flight arrival concentration adjust factor
Average Claim Unit Size	NA	215	230	LF/unit
Airline Space				
Airline Operations & Offices (excluding ATO)	3,000	1,800	2,800	SF/EQA
Make-up capacity (carts or LD3s)	2	3	4	/EQA
Baggage Make-up area	600	600	300	SF/cart
Checked Bags/pax for EDS screening	1.1	1.1	1.1	domestic
	1.5	1.5	1.5	int'l
Airline Clubs & 1st/Bus. Class Lounges	6,107	11,291	5,284	SF/million enpl (existing ratio)
Baggage Service Offices	2.0	2.0	1.8	SF/pk hr dep dom o&d+int'l total pass.
Concessions				
% located in secure area	90%	80%	90%	
Food/Beverage planning factor	5.1	5.1	5.7	SF/1,000 annual enplaned pax
News/Gift/Retail planning factor	4.1	4.1	4.4	SF/1,000 annual enplaned pax
Duty Free planning factor	1.5	2.9	2.1	SF/1,000 annual enplaned pax
Other services planning factor	0.7	0.7	0.7	SF/1,000 annual enplaned pax
Concession Support Area	25%	25%	25%	of concession space
Other Public Areas				
Public Seating and Meeter/Greeter Lobbies	5%	15%	5%	seating for __% of pass. & visitors

Table IV.3-2
EWR - Estimate of Concession Utilization Factors (Terminals A & B)

Applied to annual enplanements in thousands

	Range 0.1 - 0.6 Food/Bev	Retail	
Passenger Characteristics			
Business/Pleasure	0.4	0.4	
Domestic/Int'l	0.2	0.2	
Originating airport, XXX/other	0.4	0.4	
Daily peaking, low/high	0.5	0.5	
Dwell times, short/long	0.4	0.4	
Facility Characteristics			
Scattered/clustered	0.4	0.4	
Difficult/easy access	0.5	0.5	
Location, away from gates/view of gates	0.1	0.1	
Landside/airside	0.1	0.1	
Term config, short walks/long walks	0.5	0.5	
Retail Characteristics (food/bev)			
Fast food/sit down	0.3		
Variety, not important/important	0.4		
Street pricing Policy, no/strict yes	0.4		
Non-branded/Nat'l,regional brands	0.5		
Retail Characteristics (news/gift/specialty)			
Traditional products/specialtys		0.5	
Non-branded/Nat'l,regional brands		0.5	
Street pricing Policy, no/strict yes		0.4	
Prominence as tourist attraction, low/high		0.5	
UF Factor (Retail factor discounted 25%)	**5.1**	**4.1**	SF/1,000 annual enplanements

	Range 0.1 - 0.6 Duty Free T-A	T-B	
Passenger Characteristics			
Business/Pleasure	0.4	0.5	
Nationality, U.S. cits/Foreign visitng US	0.2	0.2	
European & Latin destinations/Asia Pacific	0.1	0.4	
Passenger dwell times, short/long	0.2	0.5	
Facility Characteristics			
Visibility & Access, poor/good	0.3	0.5	
Dutyfree, gate delivery/buy & take	0.1	0.1	
Retail Characteristics			
Merchandise mix, limited/diverse	0.1	0	
Merchandise cost savings, lower/significant	0.1	0.3	
UF Factor	**1.5**	2.9	SF/1,000 annual enplanements

Table IV.3-3
EWR - Estimate of Concession Utilization Factors (Terminal C)

Applied to annual enplanements in thousands

	Range 0.1 - 0.6 Food/Bev	Retail	
Passenger Characteristics			
Business/Pleasure	0.4	0.4	
Domestic/Int'l	0.2	0.2	
Originating airport, XXX/other	0.4	0.4	
Daily peaking, low/high	0.2	0.2	
Dwell times, short/long	0.3	0.3	
Facility Characteristics			
Scattered/clustered	0.5	0.5	
Difficult/easy access	0.5	0.5	
Location, away from gates/view of gates	0.5	0.5	
Landside/airside	0.6	0.6	
Term config, short walks/long walks	0.4	0.4	
Retail Characteristics (food/bev)			
Fast food/sit down	0.3		
Variety, not important/important	0.5		
Street pricing Policy, no/strict yes	0.4		
Non-branded/Nat'l,regional brands	0.5		
Retail Characteristics (news/gift/specialty)			
Traditional products/specialtys		0.5	
Non-branded/Nat'l,regional brands		0.5	
Street pricing Policy, no/strict yes		0.4	
Prominence as tourist attraction, low/high		0.5	
UF Factor (Retail factor discounted 25%)	**5.7**	**4.4**	SF/1,000 annual enplanements

	Range 0.1 - 0.6 Duty Free	
Passenger Characteristics		
Business/Pleasure	0.5	
Nationality, U.S. cits/Foreign visitng US	0.2	
European & Latin destinations/Asia Pacific	0.2	
Passenger dwell times, short/long	0.3	
Facility Characteristics		
Visibility & Access, poor/good	0.4	
Dutyfree, gate delivery/buy & take	0.1	
Retail Characteristics		
Merchandise mix, limited/diverse	0.2	
Merchandise cost savings, lower/significant	0.2	
UF Factor	**2.1**	SF/1,000 annual enplanements

Table IV.3-4
EWR – 2015 Remote Parking Positions

	Terminal							Total	Existing [1]
	T-A	T-B	T-C						
Regional Aircraft (Group II)	1							1	6
Narrowbody (Group III)	23	4	14					41	
B757 (Group IIIa)	5	1	3					9	3
Widebody (Group IV)		1	2					3	6
B747/A340 (Group V)		1	5					6	11
A380 (Group VI)								0	
Total Positions	29	7	24	0	0	0	0	60	26 positions

[1] - Source: Port Authority Aircraft Gates Drawing Number EWR - 11115, 3/8/05

IV.3.2 Terminal A Capacity

Gates

T-A currently has a gate capacity which is mostly WB. However, the existing and forecast fleet mix is primarily NB. Although the forecast is for eight more gates by the end of the forecast period, the existing frontage (NBEG) has adequate capacity to meet this demand if the gates are reconfigured.

Ticketing and Check-in

T-A should have excess staffed ATO positions through the forecast period but additional kiosks would be needed. In the current configurations, additional ATO counter length would be needed unless a higher percentage of kiosks are located within the queuing area. It has been suggested that the number and configuration of the baggage make-up conveyors limits the flexibility of check-in counter utilization, and thus the capacity of the ATO. However, all of the airlines either have (or are forecast to have) departures during the morning peaks. Thus, the capacity of the ATO counters may be more constrained by the number of baggage conveyors and allocation of airlines to the make-up areas than by the number of check-in positions. This would require that changes be made in the outbound baggage systems in order to take advantage of the ATO capacity.

The existing 32' ticket lobby depth is less than the recommended 45' depth for the forecast level of activity.

Security Screening, Holdrooms and Circulation

T-A's existing 10 SSCP lanes would need to increase to 19 lanes by the end of the forecast period, assuming that each concourse continues to have a separate SSCP. The distribution of the lanes would depend on the long term airline assignments and gate mixes on each concourse.

The connected satellite configuration does not relate directly to typical concourse corridor dimensions. The 25' wide connector elements are of adequate width as connectors when SSCP lanes are removed, as planned for T-B. The Circulation corridors within each satellite vary in width depending on seating and concession configurations.

T-A has adequate holdroom area through 2020.

Domestic Baggage Claim

T-A has seven claim units ranging in size from 103 LF to 200 LF. Although this allows many individual flights to be displayed on separate claim units, it reduces the flexibility of use. The separation between the claim units and adjacent walls or offices is inadequate. Much of the baggage claim area occupied by older configuration claim units which occupy large areas relative to the claim frontage.

Federal Inspection Services Facilities

There are no non-pre-cleared international arrivals forecast to operate from T-A.

Airline Space

T-A is undersized in terms of offices in proximity to the ATO, but has excess operations/office capacity over-all.

The terminal should have adequate cart staging positions through the forecast period, although the area and configurations are less than recommended. As noted previously, the separate make-up areas and limited conveyor capacity limits the full utilization of some of the make-up rooms. Checked baggage screening is done by off-line EDS units located in the baggage rooms which limits capacity.

T-A has three clubs beyond security (AA, CO and UA). It is anticipated that the CO club may need to be expanded in the future to accommodate additional activity,

There is adequate baggage service office space through the forecast period.

Concessions

Only 25% of the major concessions are located in secure areas of the terminal. It is estimated that additional concessions would be needed by 2010.

Other Public Areas

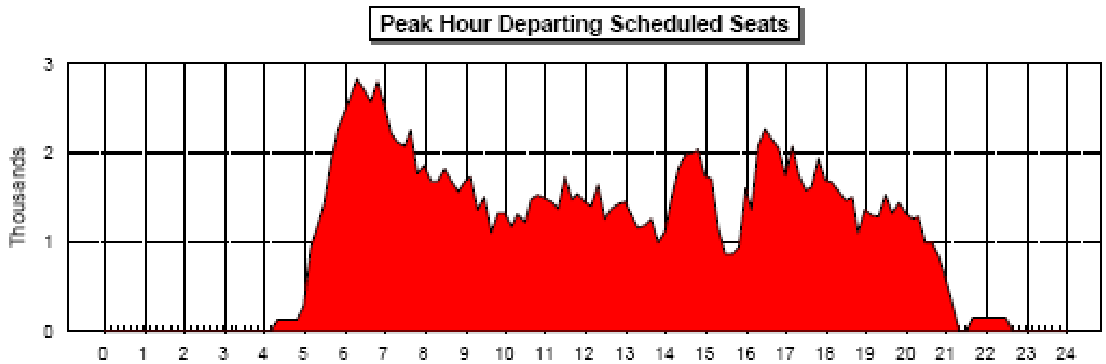
T-A has insufficient area for meeter/greeters.

Non-secure restrooms and secure restrooms are considered undersized for current activity.

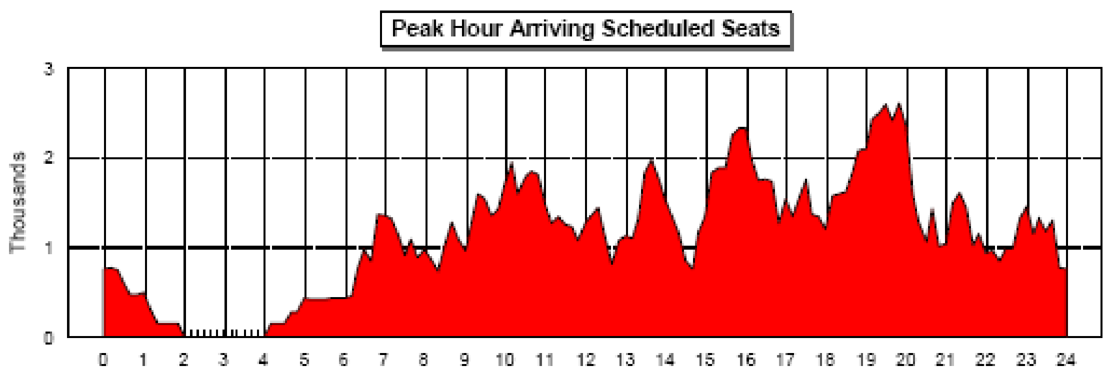
Annual Capacity

Terminal A is relatively well balanced at 6.7 - 7.3 million enplanements, except for the SSCP which limits activity to 3.7 million. Baggage claim capacity is similar to check-in and gate capacity.

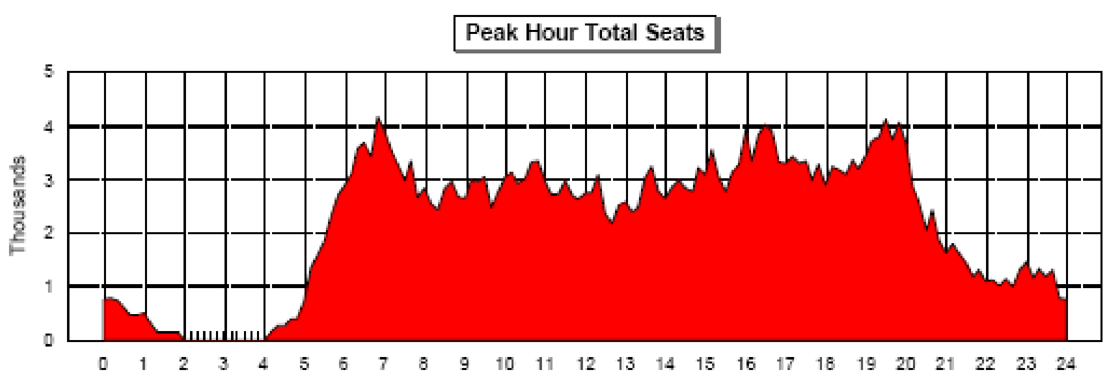
Exhibit IV.3-1
EWR– Peak Hour Seats: Terminal A (Domestic)
(2015 Design Day)



Peak Hour Seats: 2,811 begins at 620 Daily Seats: 25,779
Peak Hour = 10.9% of daily seats

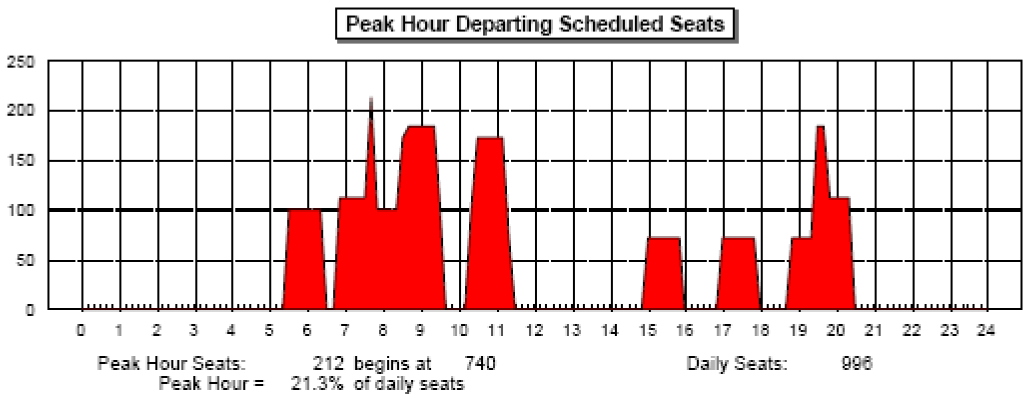


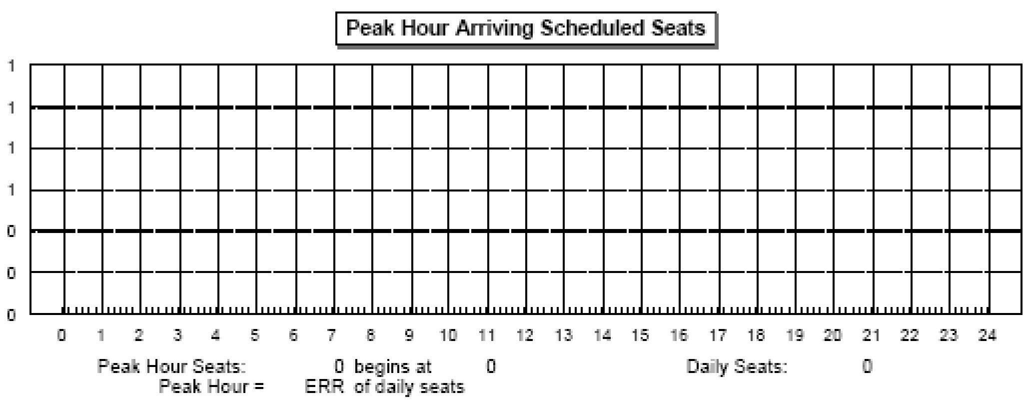
Peak Hour Seats: 2,618 begins at 1950 Daily Seats: 26,889
Peak Hour = 9.7% of daily seats



Peak Hour Seats: 4,158 begins at 650 Daily Seats: 52,668
Peak Hour = 7.9% of daily seats

Exhibit IV.3-2
EWR– Peak Hour Seats: Terminal A (International)
(2015 Design Day)





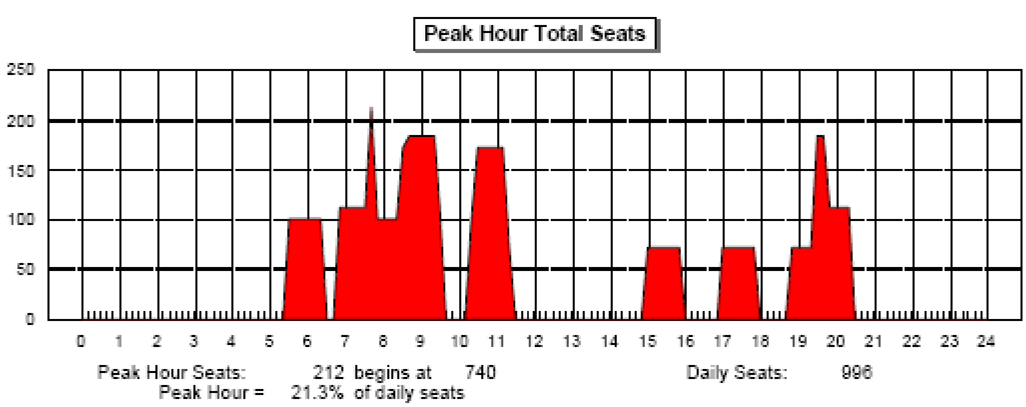


Table IV.3-5
EWR – Terminal Capacity Analysis – Terminal A

Terminal A

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Recommended Facilities - Demand: Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Projected Surplus / (Deficiency): Forecast Year Activity 2010	2015	2020	2025
Annual Enplanements											
Domestic		3,308,522	5,292,500	5,649,000	6,068,800	6,527,300					
International		138,124	177,800	214,900	260,700	314,400					
Combined		3,446,646	5,470,300	5,863,900	6,329,500	6,841,700					
Design Hour Factors:											
Domestic Load Factor		85%	85%	85%	85%	85%					
Domestic Connect %		0%	0%	0%	0%	0%					
International Load Factor		85%	85%	85%	85%	85%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		1,680	2,040	2,390	2,570	2,760					
Enplaned Domestic total		1,680	2,040	2,390	2,570	2,760					
Deplaned Domestic O&D		1,630	1,930	2,230	2,400	2,580					
Deplaned Domestic total		1,630	1,930	2,230	2,400	2,580					
Enplaned International O&D		140	160	180	220	260					
Enplaned International total		140	160	180	220	260					
Deplaned International O&D		0	0	0	0	0					
Deplaned International total		0	0	0	0	0					
Meeter/Greeters per O&D Passenger		0.7	0.7	0.7	0.7	0.7					

Table IV.3-5
EWR – Terminal Capacity Analysis – Terminal A

Terminal A

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	0 gates	7	5	3	3	3	(7)	(5)	(3)	(3)	(3) gates
Narrowbody (Group III)	4 gates	17	21	24	26	29	(13)	(17)	(20)	(22)	(25) gates
B757 (Group IIIa)	8 gates	5	5	5	5	5	3	3	3	3	3 gates
Widebody (Group IV)	15 gates						15	15	15	15	15 gates
B747/A340 (Group V)	2 gates						2	2	2	2	2 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	29 gates	29	31	32	34	37	0	(2)	(3)	(5)	(8) gates
Narrowbody Equivalent Gates (NBEG)	39.1 NBEG	27.4	30.0	31.6	33.6	36.6	11.7	9.1	7.5	5.5	2.5 NBEG
Equivalent Aircraft (EQA)	48.5 EQA	26.3	29.5	31.7	33.7	36.7	22.2	19.0	16.8	14.8	11.8 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates						0	0	0	0	0 gates
B757 (Group IIIa)	0 gates						0	0	0	0	0 gates
Widebody (Group IV)	0 gates						0	0	0	0	0 gates
B747/A340 (Group V)	0 gates						0	0	0	0	0 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	0 gates	0	0	0	0	0	0	0	0	0	0 gates
Narrowbody Equivalent Gates (NBEG)	0.0 NBEG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 NBEG
Equivalent Aircraft (EQA)	0.0 EQA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	67 pos	46	40	47	51	55	21	27	20	16	12 pos
Self-Service Kiosks	61 units	32	49	58	62	67	29	12	3	(1)	(6) units
Equivalent Positions	128 pos	78	89	105	113	122	50	39	23	15	6 pos
Linear Positions	121 pos	74	85	100	107	116	47	36	21	14	5 pos
Counter length	500 LF	370	430	500	540	580	130	70	0	(40)	(80) LF
Ticket Lobby - depth	32 LF	45	45	45	45	45	(13)	(13)	(13)	(13)	(13) LF
Ticket Lobby - area	18,880 SF	18,500	21,500	25,000	27,000	29,000	380	(2,620)	(6,120)	(8,120)	(10,120) SF
Ticket Counter - International											
Conventional Staffed Positions	7 pos	6	5	5	6	7	1	2	2	1	0 pos
Self-Service Kiosks	0 units	0	2	3	3	4	0	(2)	(3)	(3)	(4) units
Equivalent Positions	7 pos	6	7	8	9	11	1	0	(1)	(2)	(4) pos
Linear Positions	7 pos	6	7	8	9	11	1	0	(1)	(2)	(4) pos
Counter length	30 LF	30	40	40	50	60	0	(10)	(10)	(20)	(30) LF
Ticket Lobby - depth or separation	32 LF	45	45	45	45	45	(13)	(13)	(13)	(13)	(13) LF
Ticket Lobby - area	0 SF	800	1,000	1,000	1,300	1,500	(800)	(1,000)	(1,000)	(1,300)	(1,500) SF
Ticket Counter - area	5,300 SF	4,100	4,900	5,600	6,100	6,600	1,200	400	(300)	(800)	(1,300) SF
Subtotal	24,180 SF	23,400	27,400	31,600	34,400	37,100					SF

Table IV.3-5
EWR – Terminal Capacity Analysis – Terminal A

Terminal A

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	Forecast Year Activity 2015	Forecast Year Activity 2020	Forecast Year Activity 2025	
HOLDROOMS & SECURE CIRCULATION													
Security Screening (SSCP) Lanes	10	lanes	12	14	16	17	19	(2)	(4)	(6)	(7)	(9)	lanes
Checkpoint/Search Area	13,790	SF	15,800	18,400	21,000	22,300	24,900	(2,010)	(4,610)	(7,210)	(8,510)	(11,110)	SF
Secure Circulation	39,270	SF	45,400	49,700	52,300	55,600	60,600	(6,130)	(10,430)	(13,030)	(16,330)	(21,330)	SF
Concourse Width	25	LF	30	30	30	30	30	(5)	(5)	(5)	(5)	(5)	LF
Sterile (Int'l Arrivals) Circulation	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Holdrooms:													
Regional Aircraft (Groups II & III)		SF	5,600	4,000	2,400	2,400	2,400						SF
Narrowbody (Group III)		SF	31,500	38,900	44,400	48,100	53,700						SF
B757 (Group IIIa)		SF	12,000	12,000	12,000	12,000	12,000						SF
Widebody (Group IV)		SF	0	0	0	0	0						SF
B747/A340 (Group V)		SF	0	0	0	0	0						SF
A380 (Group VI)		SF	0	0	0	0	0						SF
Total Holdroom Area	66,900	SF	49,100	54,900	58,800	62,500	68,100	17,800	12,000	8,100	4,400	(1,200)	SF
Subtotal	119,960	SF	110,300	123,000	132,100	140,400	153,600						SF
DOMESTIC BAGGAGE CLAIM													
Claim Frontage Required	-	LF	730	700	810	870	930						LF
Claim Units	7	units	5	4	5	5	6	2	3	2	2	1	units
Claim Frontage Programmed	1,050	LF	850	680	850	850	1,020	200	370	200	200	30	LF
Baggage Claim Area	33,080	SF	29,800	23,800	29,800	29,800	35,700	3,280	9,280	3,280	3,280	(2,620)	SF
FEDERAL INSPECTION SERVICES													
Primary Inspection:								0	0	0	0	0	
Double Inspection Counters	0	dbl. counters	0	0	0	0	0	0	0	0	0	0	dbl. counters
Counter & Queue Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Baggage Claim:													
Claim Frontage Required	-	LF	0	0	0	0	0						LF
Claim Units	0	units	0	0	0	0	0	0	0	0	0	0	units
Claim Frontage Programmed	0	LF	0	0	0	0	0	0	0	0	0	0	LF
Baggage Claim Area	0	SF	0	0	0	0	0	0	0	0	0	0	SF
Subtotal	0	SF	0	0	0	0	0						SF

Table IV.3-5
EWR – Terminal Capacity Analysis – Terminal A

Terminal A

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
AIRLINE SPACE											
ATO Offices	8,700 SF	12,000	14,100	16,200	17,700	19,200	(3,300)	(5,400)	(7,500)	(9,000)	(10,500) SF
Airline Operations & Offices (excluding ATO)	160,450 SF	78,900	88,500	95,100	101,100	110,100	81,550	71,950	65,350	59,350	50,350 SF
Baggage Handling											
Estimated make-up capacity	85 carts/LD3s	53	59	63	67	73	32	26	22	18	12 carts/LD3s
Baggage Make-up area	38,870 SF	31,600	35,400	38,000	40,400	44,000	7,270	3,470	870	(1,530)	(5,130) SF
Checked Baggage Screening	7,760 SF	16,000	16,000	19,200	22,400	22,400	(8,240)	(8,240)	(11,440)	(14,640)	(14,640) SF
Baggage Claim Off-load	27,000 SF	12,500	10,000	12,500	12,500	15,000	14,500	17,000	14,500	14,500	12,000 SF
Airline Clubs & 1st/Bus. Class Lounges	21,050 SF	21,100	23,000	23,000	23,000	23,000	(50)	(1,950)	(1,950)	(1,950)	(1,950) SF
Baggage Service Offices	6,890 SF	3,300	3,900	4,500	4,800	5,200	3,590	2,990	2,390	2,090	1,690 SF
Subtotal	270,720 SF	175,400	190,900	208,500	221,900	238,900					SF
CONCESSIONS											
Ground Services/Information Counter	400 SF	200	200	200	200	200	200	200	200	200	200 SF
Food/Beverage; Secure	5,750 SF	15,800	25,100	26,900	29,100	31,400	(10,050)	(19,350)	(21,150)	(23,350)	(25,650) SF
News/Gift/Retail; Secure	1,140 SF	12,700	20,200	21,600	23,400	25,200	(11,560)	(19,060)	(20,460)	(22,260)	(24,060) SF
Subtotal; Secure Concessions	6,890 SF	28,500	45,300	48,500	52,500	56,600	(21,610)	(38,410)	(41,610)	(45,610)	(49,710) SF
Food/Beverage; Non-Secure	13,410 SF	1,800	2,800	3,000	3,200	3,500	11,610	10,610	10,410	10,210	9,910 SF
News/Gift/Retail; Non-Secure	7,750 SF	1,400	2,200	2,400	2,600	2,800	6,350	5,550	5,350	5,150	4,950 SF
Subtotal; Non-Secure Concessions	21,160 SF	3,200	5,000	5,400	5,800	6,300	17,960	16,160	15,760	15,360	14,860 SF
Duty Free	0 SF	200	300	300	400	500	(200)	(300)	(300)	(400)	(500) SF
Other Services	730 SF	2,400	3,800	4,100	4,400	4,800	(1,670)	(3,070)	(3,370)	(3,670)	(4,070) SF
Concession Support Area	0 SF	8,600	13,600	14,600	15,800	17,100	(8,600)	(13,600)	(14,600)	(15,800)	(17,100) SF
Subtotal	29,180 SF	43,100	68,200	73,100	79,100	85,500					SF
OTHER PUBLIC AREAS											
Public Seating and Meeter/Greeter Lobbies	1,500 SF	2,100	2,500	2,800	3,100	3,300	(600)	(1,000)	(1,300)	(1,600)	(1,800) SF
Restrooms - Terminal Locations	2,990 SF	5,500	6,600	7,600	8,200	8,800	(2,510)	(3,610)	(4,610)	(5,210)	(5,810) SF
Restrooms - Concourse Locations	4,250 SF	6,000	6,800	7,300	7,800	8,400	(1,750)	(2,550)	(3,050)	(3,550)	(4,150) SF
Subtotal	8,740 SF	13,600	15,900	17,700	19,100	20,500					SF
Vacant spaces suitable for: airline offices or lounges	0 SF										SF

[1] - Sources:
Port Authority of NY & NJ-
area plans, post 12/31/02, March 2003
Hirsh Associates site visit, May 2005
Hirsh Associates analysis

IV.3.3 Terminal B Capacity

Gates

T-B currently functions as two terminals in terms of gates: exclusive use domestic on B-1; and common use international on B-2 and B-3. This increases the number of nominal gates as compared to a fully common use terminal since the gate demand peaks for the domestic airlines do not coincide with those of the international carriers. T-B is projected to require more Group V gates than it currently has. Existing frontage (NBEG) has adequate capacity to meet this demand through 2020 if the gates are reconfigured and more international activity can depart from B-1.

Ticketing and Check-in

The proposed re-configuration of T-B would provide sufficient CUTE international positions through 2020. There would be excess domestic positions through the forecast period which could be converted to international positions after 2020.

The re-configured international lobby is proposed to be 50' deep which is the recommended depth for international activity. The new domestic lobby's 40' depth is less than the 45' recommended depth.

Security Screening, Holdrooms and Circulation

The proposed re-configuration of the checkpoints should provide adequate SSCP capacity through the forecast period.

The connected satellite configuration of T-B does not relate directly to typical concourse corridor dimensions. The 25' wide connector elements are of adequate width as connectors when SSCP lanes are removed, as planned for T-B. The Circulation corridors within each satellite vary in width depending on seating and concession configurations.

T-B has sterile edge corridors around the perimeters of satellites B-2 and B-3 which vary in clear width between 8 and 10 feet.

Holdrooms are slightly undersized for the Base year demand and becomes significantly undersized as the aircraft mix shifts to larger aircraft over the forecast period.

Domestic Baggage Claim

T-B's proposed new claim area will improve the claim unit separations and wall clearances, but will still have some large area per frontage claim units due to structural conditions on the former parking level.

Federal Inspection Services Facilities

In the forecasts and Base schedules, all of CO's international arrivals have been assigned to T-C. Due to the limited capacity of the T-C FIS, some CO arrivals have used T-B, but depart from T-C.

The T-B FIS would have excess primary inspection position capacity through the end of the forecast period, and sufficient baggage claim capacity. The 45' primary inspection queue depth is less than the 77' recommended by CBP.

Airline Space

T-B will have adequate ATO office space, but will require more operations space in the near term, primarily for international airlines.

The planned expansion should provide adequate make-up area through 2020 although the conveyor configurations and cart staging is not finalized at this time. Pre-expansion conveyor configurations did not make optimum use use the available area. EDS areas will be adequate through the forecast period.

T-B has two domestic clubs (DL and NW) beyond security. A large international 1st/Business Class lounge prior to security is leased to Virgin Atlantic but is also used by other international carriers. There is also lounge space on Concourse B3 used by British Airways, Lufthansa and SAS. Based on growth of international airlines, additional lounge space is anticipated in the future.

There is insufficient baggage service offices and storage, which may be off-set by the use of third party ground handlers for international flights.

Concessions

Approximately 44% of major concessions will be within secure areas of the terminal after the planned renovations. The total amount of concessions should be adequate through 2020.

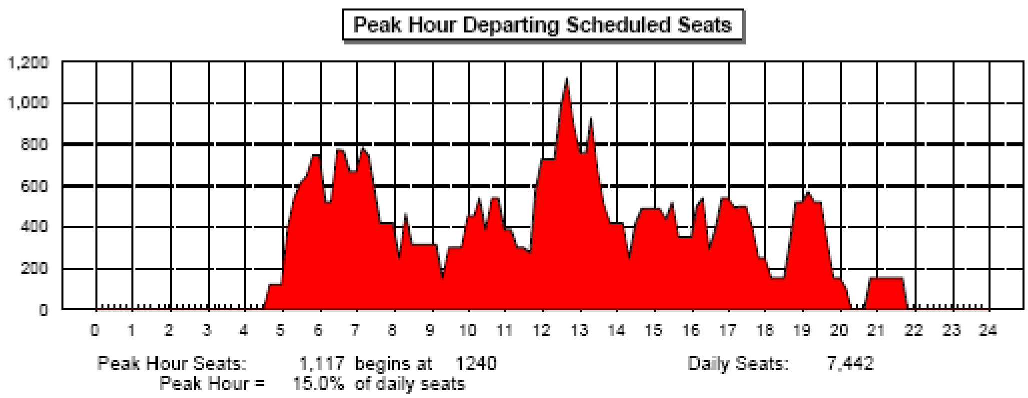
Other Public Areas

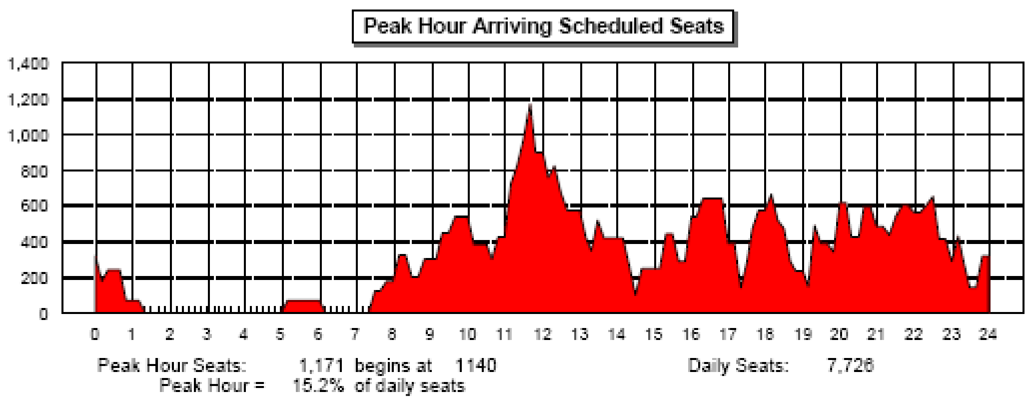
T-B will have adequate meeter/greeter space through the planning period after the expansion.
Non-secure restrooms and secure restrooms are considered undersized for current activity.

Annual Capacity

Terminal B is relatively balanced at 4.5 million enplanements for gates and SSCP, except for holdrooms at 3.4 million enplanements. Check-in provides the most capacity. The FIS has a capacity for 3.2 - 4.5 million international enplanements.

Exhibit IV.3-3
EWR– Peak Hour Seats: Terminal B (Domestic)
(2015 Design Day)





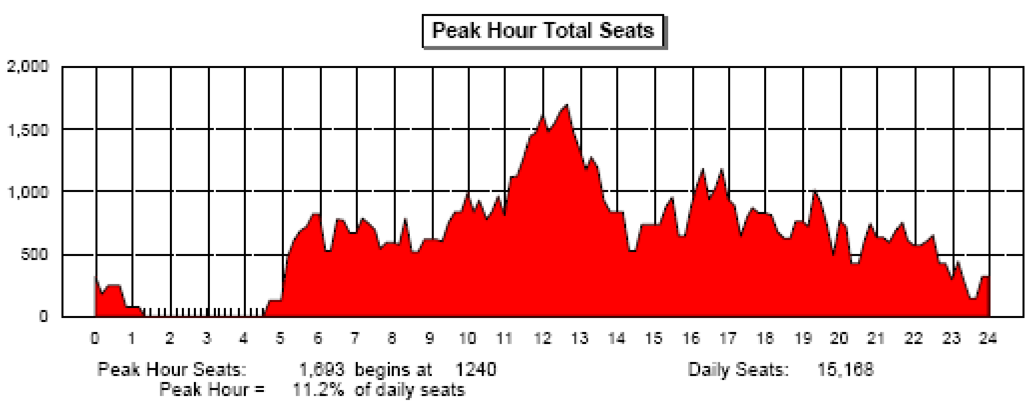
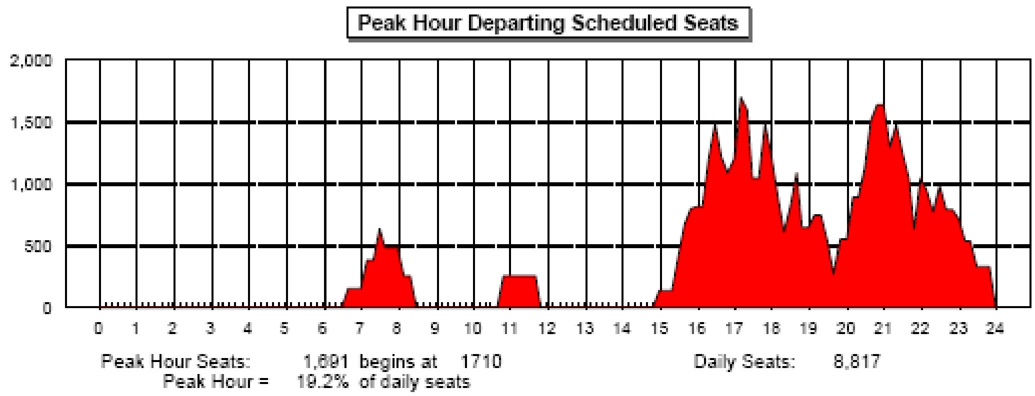
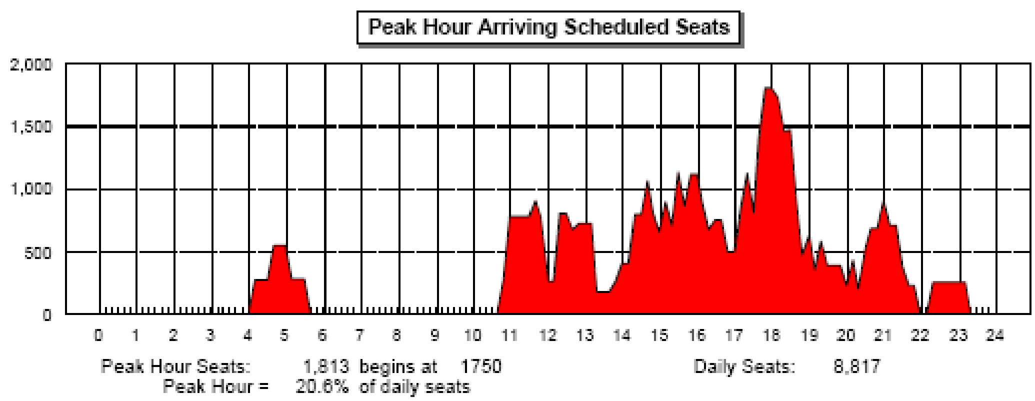


Exhibit IV.3-4
EWR– Peak Hour Seats: Terminal B (International)
(2015 Design Day)





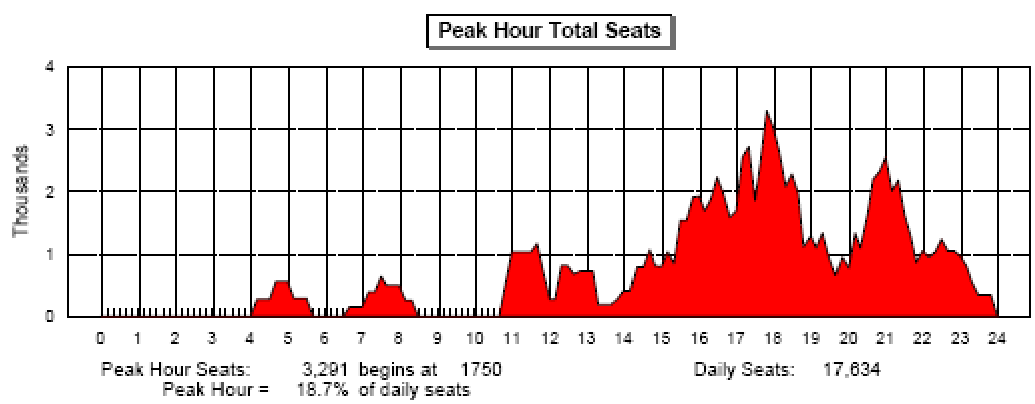


Table IV.3-6
EWR – Terminal Capacity Analysis – Terminal B

Terminal B

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
Annual Enplanements											
Domestic		1,370,436	1,548,900	1,695,100	1,719,100	1,743,200					
International		1,631,962	1,897,100	2,256,600	2,693,700	3,196,200					
Combined		3,002,398	3,446,000	3,951,700	4,412,800	4,939,400					
Design Hour Factors:											
Domestic Load Factor		85%	85%	85%	85%	85%					
Domestic Connect %		0%	0%	0%	0%	0%					
International Load Factor		85%	95%	95%	95%	95%					
International Connect %		0%	0%	0%	0%	0%					
Design Hour Passengers											
Enplaned Domestic O&D		860	910	950	960	980					
Enplaned Domestic total		860	910	950	960	980					
Deplaned Domestic O&D		620	810	1,000	1,010	1,030					
Deplaned Domestic total		620	810	1,000	1,010	1,030					
Enplaned International O&D		1,570	1,590	1,610	1,920	2,280					
Enplaned International total		1,570	1,590	1,610	1,920	2,280					
Deplaned International O&D		1,230	1,480	1,720	2,050	2,440					
Deplaned International total		1,230	1,480	1,720	2,050	2,440					
Meeter/Greeters per O&D Passenger		0.7	0.7	0.7	0.7	0.7					

Table IV.3-6
EWR – Terminal Capacity Analysis – Terminal B

Terminal B

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	0 gates	1	1	1	1	1	(1)	(1)	(1)	(1)	(1) gates
Narrowbody (Group III)	3 gates	4	6	10	11	11	(1)	(3)	(7)	(8)	(8) gates
B757 (Group IIIa)	1 gates	2	2	1	1	1	(1)	(1)	0	0	0 gates
Widebody (Group IV)	13 gates	3	2				10	11	13	13	13 gates
B747/A340 (Group V)	7 gates	9	10	11	12	14	(2)	(3)	(4)	(5)	(7) gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	24 gates	19	21	23	25	27	5	3	1	(1)	(3) gates
Narrowbody Equivalent Gates (NBEG)	36.9 NBEG	28.5	30.9	32.7	35.6	39.4	8.4	6.0	4.2	1.3	-2.5 NBEG
Equivalent Aircraft (EQA)	48.6 EQA	37.9	40.8	42.5	46.3	51.9	10.7	7.8	6.1	2.3	-3.3 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates			1	1	1	0	0	(1)	(1)	(1) gates
B757 (Group IIIa)	0 gates			1	1	1	0	0	(1)	(1)	(1) gates
Widebody (Group IV)	9 gates	1	1				8	8	9	9	9 gates
B747/A340 (Group V)	6 gates	5	6	6	7	9	1	0	0	(1)	(3) gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	15 gates	6	7	8	9	11	9	8	7	6	4 gates
Narrowbody Equivalent Gates (NBEG)	24.9 NBEG	11.0	12.9	13.5	15.4	19.2	13.9	12.0	11.4	9.5	5.7 NBEG
Equivalent Aircraft (EQA)	33.9 EQA	15.9	18.7	19.1	21.9	27.5	18.0	15.2	14.8	12.0	6.4 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	38 pos	17	16	17	17	17	21	22	21	21	21 pos
Self-Service Kiosks	16 units	13	17	18	18	19	3	(1)	(2)	(2)	(3) units
Equivalent Positions	54 pos	30	33	35	35	36	24	21	19	19	18 pos
Linear Positions	54 pos	30	33	35	35	36	24	21	19	19	18 pos
Counter length	285 LF	150	170	180	180	180	135	115	105	105	105 LF
Ticket Lobby - depth	40 LF	45	45	45	45	45	(5)	(5)	(5)	(5)	(5) LF
Ticket Lobby - area	11,400 SF	7,500	8,500	9,000	9,000	9,000	3,900	2,900	2,400	2,400	2,400 SF
Ticket Counter - International											
Conventional Staffed Positions	114 pos	83	79	94	112	133	31	35	20	2	(19) pos
Self-Service Kiosks	0 units	0	0	0	0	0	0	0	0	0	0 units
Equivalent Positions	114 pos	83	79	94	112	133	31	35	20	2	(19) pos
Linear Positions	114 pos	83	79	94	112	133	31	35	20	2	(19) pos
Counter length	510 LF	420	400	470	560	670	90	110	40	(50)	(160) LF
Ticket Lobby - depth or separation	50 LF	50	50	50	50	50	0	0	0	0	0 LF
Ticket Lobby - area	20,260 SF	23,100	22,000	25,900	30,800	36,900	(2,840)	(1,740)	(5,640)	(10,540)	(16,640) SF
Ticket Counter - area	9,540 SF	7,400	7,300	8,400	9,600	11,200	2,140	2,240	1,140	(60)	(1,660) SF
Subtotal	41,200 SF	38,000	37,800	43,300	49,400	57,100					SF

Table IV.3-6
EWR – Terminal Capacity Analysis – Terminal B

Terminal B

	Existing and Approved Buildings Through 2008 [1]		Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
HOLDROOMS & SECURE CIRCULATION													
Security Screening (SSCP) Lanes	14	lanes	11	11	12	13	14	3	3	2	1	0	lanes
Checkpoint/Search Area	28,750	SF	14,400	14,400	15,800	17,100	18,400	14,350	14,350	12,950	11,650	10,350	SF
Secure Circulation	47,940	SF	47,200	51,200	54,200	59,000	65,200	740	(3,260)	(6,260)	(11,060)	(17,260)	SF
Concourse Width	25	LF	30	30	30	30	30	(5)	(5)	(5)	(5)	(5)	LF
Sterile (Int'l Arrivals) Circulation	25,240	SF	9,700	11,300	11,900	13,500	16,900	15,540	13,940	13,340	11,740	8,340	SF
Holdrooms:													
Regional Aircraft (Groups II & III)		SF	800	800	800	800	800						SF
Narrowbody (Group III)		SF	7,400	11,100	18,500	20,400	20,400						SF
B757 (Group IIIa)		SF	4,800	4,800	2,400	2,400	2,400						SF
Widebody (Group IV)		SF	8,600	5,700	0	0	0						SF
B747/A340 (Group V)		SF	40,100	44,500	49,000	53,400	62,300						SF
A380 (Group VI)		SF	0	0	0	0	0						SF
Total Holdroom Area	60,050	SF	61,700	66,900	70,700	77,000	85,900	(1,650)	(6,850)	(10,650)	(16,950)	(25,850)	SF
Subtotal	161,980	SF	133,000	143,800	152,600	166,600	186,400						SF
DOMESTIC BAGGAGE CLAIM													
Claim Frontage Required	-	LF	260	270	340	340	350						LF
Claim Units	4	units	2	2	2	2	2	2	2	2	2	2	units
Claim Frontage Programmed	670	LF	340	340	340	340	340	330	330	330	330	330	LF
Baggage Claim Area	21,240	SF	11,900	11,900	11,900	11,900	11,900	9,340	9,340	9,340	9,340	9,340	SF
FEDERAL INSPECTION SERVICES													
Primary Inspection:													
Double Inspection Counters	30	dbl. counters	11	13	15	18	21	19	17	15	12	9	dbl. counters
Counter & Queue Area	39,420	SF	14,000	16,500	19,100	22,900	26,700	25,420	22,920	20,320	16,520	12,720	SF
Baggage Claim:													
Claim Frontage Required	-	LF	690	830	960	1,140	1,360						LF
Claim Units	7	units	4	4	5	6	7	3	3	2	1	0	units
Claim Frontage Programmed	1,505	LF	860	860	1,075	1,290	1,505	645	645	430	215	0	LF
Baggage Claim Area	54,850	SF	30,100	30,100	37,600	45,200	52,700	24,750	24,750	17,250	9,650	2,150	SF
Subtotal	94,270	SF	44,100	46,600	56,700	68,100	79,400						SF

Table IV.3-6
EWR – Terminal Capacity Analysis – Terminal B

Terminal B

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Recommended Facilities - Demand: Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Projected Surplus / (Deficiency): Forecast Year Activity 2010	2015	2020	2025
AIRLINE SPACE											
ATO Offices	27,295 SF	17,100	17,100	19,500	22,200	25,500	10,195	10,195	7,795	5,095	1,795 SF
Airline Operations & Offices (excluding ATO)	70,110 SF	68,200	73,400	76,500	83,300	93,400	1,910	(3,290)	(6,390)	(13,190)	(23,290) SF
Baggage Handling											
Estimated make-up capacity	100 carts/LD3s	114	122	128	139	156	(14)	(22)	(28)	(39)	(56) carts/LD3s
Baggage Make-up area	86,295 SF	68,200	73,400	76,500	83,300	93,400	18,095	12,895	9,795	2,995	(7,105) SF
Checked Baggage Screening	22,930 SF	16,000	16,000	16,000	19,200	19,200	6,930	6,930	6,930	3,730	3,730 SF
Baggage Claim Off-load	25,720 SF	15,000	15,000	17,500	20,000	22,500	10,720	10,720	8,220	5,720	3,220 SF
Airline Clubs & 1st/Bus. Class Lounges	33,900 SF	33,900	33,100	37,900	42,400	47,400	0	800	(4,000)	(8,500)	(13,500) SF
Baggage Service Offices	3,750 SF	3,700	4,600	5,400	6,100	6,900	50	(850)	(1,650)	(2,350)	(3,150) SF
Subtotal	270,000 SF	222,100	232,600	249,300	276,500	308,300					SF
CONCESSIONS											
Ground Services/Information Counter	1,730 SF	200	200	200	200	200	1,530	1,530	1,530	1,530	1,530 SF
Food/Beverage; Secure	19,825 SF	12,200	14,100	16,100	18,000	20,200	7,625	5,725	3,725	1,825	(375) SF
News/Gift/Retail; Secure	2,445 SF	9,800	11,300	13,000	14,500	16,200	(7,355)	(8,855)	(10,555)	(12,055)	(13,755) SF
Subtotal; Secure Concessions	22,270 SF	22,000	25,400	29,100	32,500	36,400	270	(3,130)	(6,830)	(10,230)	(14,130) SF
Food/Beverage; Non-Secure	21,690 SF	3,100	3,500	4,000	4,500	5,000	18,590	18,190	17,690	17,190	16,690 SF
News/Gift/Retail; Non-Secure	6,840 SF	2,500	2,800	3,200	3,600	4,100	4,340	4,040	3,640	3,240	2,740 SF
Subtotal; Non-Secure Concessions	28,530 SF	5,600	6,300	7,200	8,100	9,100	22,930	22,230	21,330	20,430	19,430 SF
Duty Free	2,900 SF	4,700	5,500	6,500	7,800	9,300	(1,800)	(2,600)	(3,600)	(4,900)	(6,400) SF
Other Services	630 SF	2,100	2,400	2,800	3,100	3,500	(1,470)	(1,770)	(2,170)	(2,470)	(2,870) SF
Concession Support Area	1,140 SF	8,600	9,900	11,400	12,900	14,600	(7,460)	(8,760)	(10,260)	(11,760)	(13,460) SF
Subtotal	57,200 SF	43,200	49,700	57,200	64,600	73,100					SF
OTHER PUBLIC AREAS											
Public Seating and Meeter/Greeter Lobbies	14,055 SF	7,100	8,800	10,400	11,700	13,300	6,955	5,255	3,655	2,355	755 SF
Restrooms - Terminal Locations	5,435 SF	6,300	7,800	9,200	10,400	11,800	(865)	(2,365)	(3,765)	(4,965)	(6,365) SF
Restrooms - Concourse Locations	8,640 SF	8,700	9,400	9,800	10,600	11,900	(60)	(760)	(1,160)	(1,960)	(3,260) SF
Subtotal	28,130 SF	22,100	26,000	29,400	32,700	37,000					SF

Vacant spaces suitable for:
airline offices or lounges 0 SF SF

[1] - Sources:
Port Authority of NY & NJ-
area plans, post 12/31/02, March 2003
Terminal B Modernization, January 2006
(may not be completed by 2008)
Hirsh Associates site visit, May 2005
Hirsh Associates analysis

IV.3.4 Terminal C Capacity

Gates

T-C shows the greatest gate growth at EWR, with demand exceeding capacity by 2010 in terms of both total and FIS gates. By the end of the forecast period gate demand is projected to increase by 30% compared to existing conditions. It should be noted that all CO international arrivals are assigned to T-C although some flights have used T-B and are towed to T-C for departure. Although CO does have a number of long ground time aircraft which are towed to remote stands during the afternoon, the net reduction in gate demand is minimal due to the morning departures peak.

Ticketing and Check-in

Continental has configured T-C with kiosks at every in-line check-in position, but varies the number that are conventionally staffed. There are sufficient total check-in positions on the lower departures level for domestic activity through the forecast period. The international check-in demand is projected to exceed the capacity of the upper departures level as presently configured after 2015.

The upper (international) departures level lobby varies in depth with the central counters having adequate depth. Counters at the ends of the building have shallower lobbies which are considered undersized for most international activity. The ticket lobby of the lower (domestic) departures level has a 65' deep lobby.

Security Screening, Holdrooms and Circulation

The existing 24 SSCP lanes should be adequate through 2015, but the area per lane should increase by 75% to meet TSA standards.

The older concourses (C-1 and C-2) are narrower (36') than recommended for moving walkways, but C-3 is the recommended width (45').

The main sterile corridors are 20' wide with moving walkways.

T-C has large holdrooms for the terminal's current mix of gates (especially concourse C-2), thus has adequate total holdroom area through 2020 even though there is a projected shortage of concourse frontage for these gates.

Domestic Baggage Claim

T-C has the recommended claim unit separations but some circulation is constrained due to structural conditions on the former parking level.

Federal Inspection Services Facilities

In the forecasts and Base schedules, all of CO's international arrivals have been assigned to T-C. Due to the limited capacity of the T-C FIS, some CO arrivals have used T-B, but depart from T-C.

The primary inspection queue depth is deeper than CBP guidelines, which is suitable for concentrated arrivals typical of a gateway hub. There are sufficient inspection positions through 2010. International baggage claim is undersized for current levels of activity.

Airline Space

T-C has adequate ATO office space, but is projected to be short of operations space after 2015.

The terminal has a large make-up system which should provide adequate capacity through the forecast period. In-line EDS systems would be needed to free up the ticket lobby areas presently occupied by EDS equipment.

Continental has two club locations in T-C. The area is expected to be adequate through the forecast period.

T-C has adequate baggage service office space through 2015.

Concessions

Virtually all of the concessions are located beyond security. It is estimated that additional concessions would be needed by 2010 in both secure and non-secure areas.

Other Public Areas

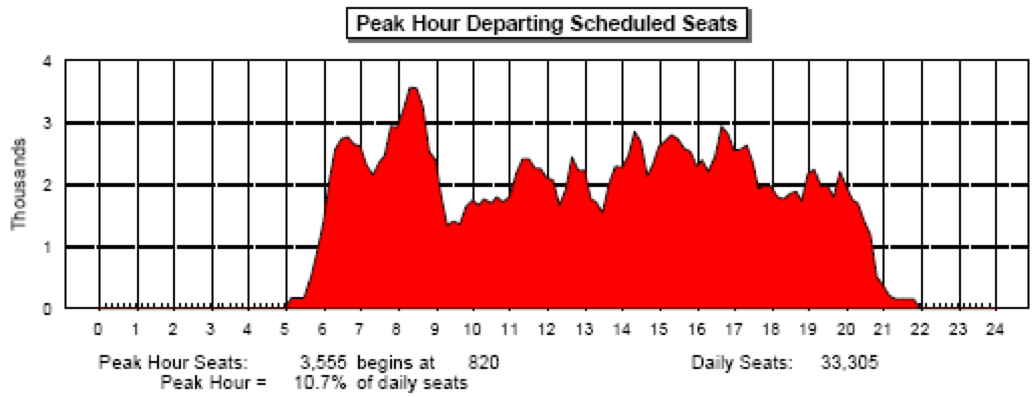
T-C has adequate meeter/greeter space in the short term, but will be inadequate long term as international arrivals passengers increase.

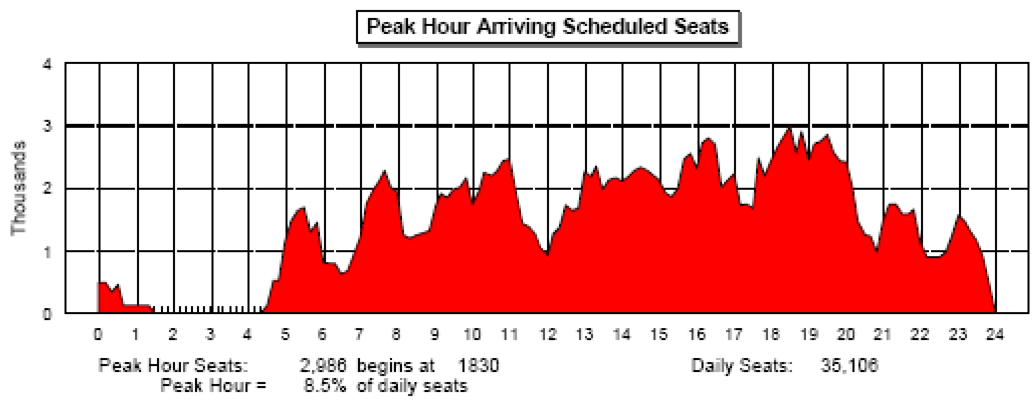
The terminal is considered to have inadequate non-secure restrooms, and will require additional secure restrooms after 2010.

Annual Capacity

Terminal C is relatively balanced at 14 million enplanements for check-in and SSCP, except for gates at 12.3 million enplanements. Holdrooms provide the most capacity. The FIS has a capacity for 3.1 - 4.3 million international enplanements, with primary inspection providing the most capacity.

Exhibit IV.3-5
EWR– Peak Hour Seats: Terminal C (Domestic)
(2015 Design Day)





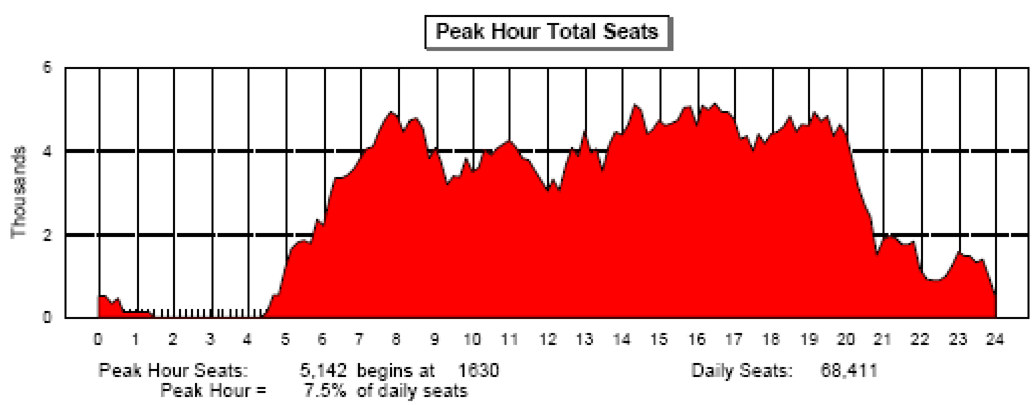
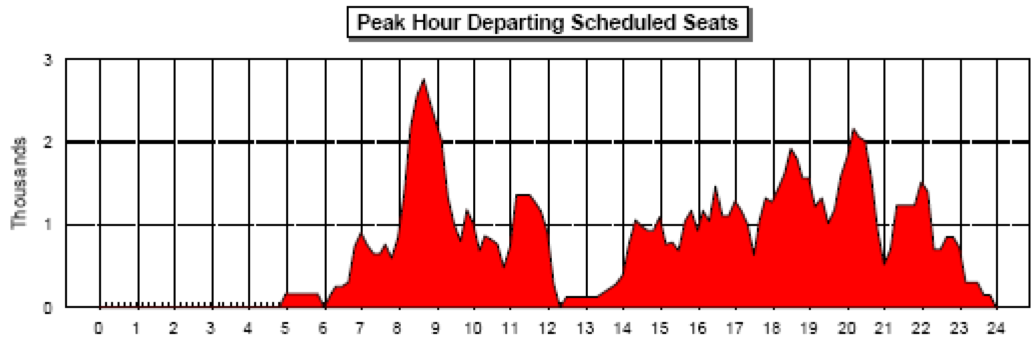
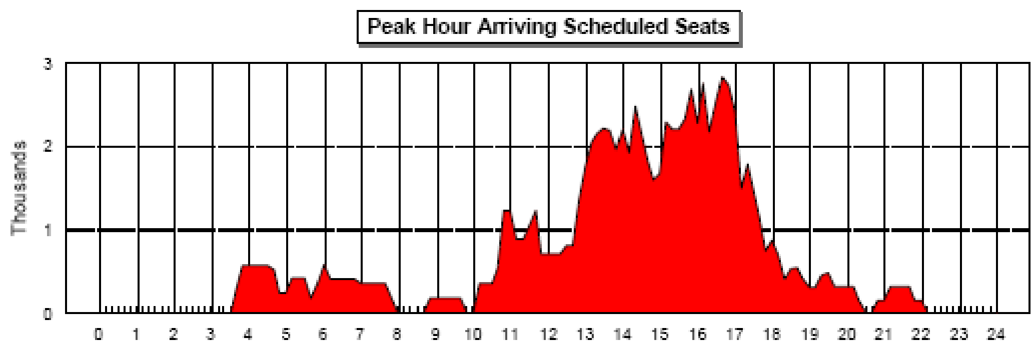


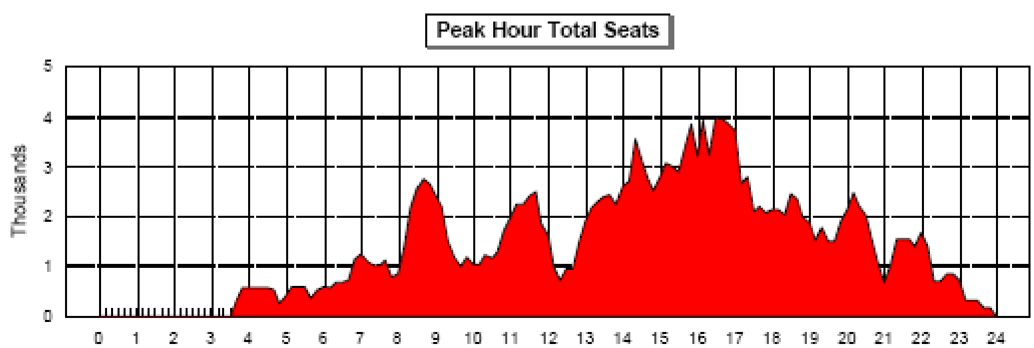
Exhibit IV.3-6
EWR– Peak Hour Seats: Terminal C (International)
(2015 Design Day)



Peak Hour Seats: 2,749 begins at 840 Daily Seats: 17,995
Peak Hour = 15.3% of daily seats



Peak Hour Seats: 2,837 begins at 1640 Daily Seats: 15,984
Peak Hour = 17.7% of daily seats



Peak Hour Seats: 3,977 begins at 1630 Daily Seats: 33,979
Peak Hour = 11.7% of daily seats

Table IV.3-7
EWR – Terminal Capacity Analysis – Terminal C

Terminal C

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand					Projected Surplus / (Deficiency)				
		Base Year Activity	Forecast Year Activity				Base Year Activity	Forecast Year Activity			
		2004	2010	2015	2020	2025	2004	2010	2015	2020	2025
Annual Enplanements											
Domestic		6,837,140	8,281,400	8,538,800	8,941,900	9,377,400					
International		2,659,088	3,853,400	4,692,200	5,735,100	6,968,700					
Combined		9,496,228	12,134,800	13,231,000	14,677,000	16,346,100					
Design Hour Factors:											
Domestic Load Factor		90%	90%	90%	90%	90%					
Domestic Connect %		15%	15%	15%	15%	15%					
International Load Factor		90%	95%	95%	95%	95%					
International Connect %		40%	35%	35%	35%	35%					
Design Hour Passengers											
Enplaned Domestic O&D		2,880	2,800	2,720	2,850	2,990					
Enplaned Domestic total		3,390	3,300	3,200	3,350	3,510					
Deplaned Domestic O&D		2,290	2,290	2,280	2,390	2,500					
Deplaned Domestic total		2,690	2,690	2,690	2,820	2,950					
Enplaned International O&D		1,340	1,520	1,700	2,080	2,520					
Enplaned International total		2,240	2,430	2,610	3,190	3,880					
Deplaned International O&D		1,120	1,440	1,750	2,140	2,600					
Deplaned International total		1,870	2,290	2,700	3,300	4,010					
Meeter/Greeters per O&D Passenger		0.7	0.7	0.7	0.7	0.7					

Table IV.3-7
EWR – Terminal Capacity Analysis – Terminal C

Terminal C

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025
GATES											
Total Gates (Domestic & International):											
Regional Aircraft (Group II)	24 gates	24	22	21	20	18	0	2	3	4	6 gates
Narrowbody (Group III)	13 gates	17	20	25	27	33	(4)	(7)	(12)	(14)	(20) gates
B757 (Group IIIa)	4 gates	5	9	12	12	10	(1)	(5)	(8)	(8)	(6) gates
Widebody (Group IV)	7 gates	7	8	8	10	10	0	(1)	(1)	(3)	(3) gates
B747/A340 (Group V)	13 gates	8	7	5	8	10	5	6	8	5	3 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	61 gates	61	66	71	77	81	0	(5)	(10)	(16)	(20) gates
Narrowbody Equivalent Gates (NBEG)	69.4 NBEG	65.0	70.6	74.4	84.4	90.6	4.4	-1.2	-5.0	-15.0	-21.2 NBEG
Equivalent Aircraft (EQA)	77.5 EQA	68.8	75.3	78.2	92.0	100.2	8.7	2.2	-0.7	-14.5	-22.7 EQA
International Arrivals Gates:											
Narrowbody (Group III)	0 gates	1	5	9	10	17	(1)	(5)	(9)	(10)	(17) gates
B757 (Group IIIa)	0 gates	3	6	9	9	8	(3)	(6)	(9)	(9)	(8) gates
Widebody (Group IV)	2 gates	2	4	6	8	8	0	(2)	(4)	(6)	(6) gates
B747/A340 (Group V)	10 gates	4	4	3	5	6	6	6	7	5	4 gates
A380 (Group VI)	0 gates						0	0	0	0	0 gates
Total Gates	12 gates	10	19	27	32	39	2	(7)	(15)	(20)	(27) gates
Narrowbody Equivalent Gates (NBEG)	22.0 NBEG	14.9	25.2	33.6	41.4	49.2	7.1	-3.2	-11.6	-19.4	-27.2 NBEG
Equivalent Aircraft (EQA)	31.8 EQA	19.9	31.6	40.5	50.9	59.4	11.9	0.2	-8.7	-19.1	-27.6 EQA
TICKETING & CHECK-IN											
Ticket Counter - Domestic											
Conventional Staffed Positions	0 pos	44	37	36	38	40	(44)	(37)	(36)	(38)	(40) pos
Self-Service Kiosks	83 units	42	40	39	40	42	41	43	44	43	41 units
Equivalent Positions	83 pos	86	77	75	78	82	(3)	6	8	5	1 pos
Linear Positions	71 pos	74	66	65	67	71	(3)	5	6	4	0 pos
Counter length	365 LF	370	330	330	340	360	(5)	35	35	25	5 LF
Ticket Lobby - depth	65 LF	50	50	50	50	50	15	15	15	15	15 LF
Ticket Lobby - area	34,900 SF	20,400	18,200	18,200	18,700	19,800	14,500	16,700	16,700	16,200	15,100 SF
Ticket Counter - International											
Conventional Staffed Positions	0 pos	55	51	56	69	83	(55)	(51)	(56)	(69)	(83) pos
Self-Service Kiosks	78 units	14	22	24	30	36	64	56	54	48	42 units
Equivalent Positions	78 pos	69	73	80	99	119	9	5	(2)	(21)	(41) pos
Linear Positions	78 pos	69	73	80	99	119	9	5	(2)	(21)	(41) pos
Counter length	430 LF	350	370	400	500	600	80	60	30	(70)	(170) LF
Ticket Lobby - depth or separation	30-48 LF	50	50	50	50	50	(2-20)	(2-20)	(2-20)	(2-20)	(2-20) LF
Ticket Lobby - area	19,700 SF	19,300	20,400	22,000	27,500	33,000	400	(700)	(2,300)	(7,800)	(13,300) SF
Ticket Counter - area	8,930 SF	8,600	8,500	8,900	10,400	12,000	330	430	30	(1,470)	(3,070) SF
Subtotal	63,530 SF	48,300	47,100	49,100	56,600	64,800					SF

Table IV.3-7
EWR – Terminal Capacity Analysis – Terminal C

Terminal C

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Forecast Year Activity 2010	2015	2020	2025	
HOLDROOMS & SECURE CIRCULATION												
Security Screening (SSCP) Lanes	24 lanes	23	23	23	26	28	1	1	1	(2)	(4)	lanes
Checkpoint/Search Area	17,870 SF	30,200	30,200	30,200	34,100	36,800	(12,330)	(12,330)	(12,330)	(16,230)	(18,930)	SF
Secure Circulation	242,825 SF	161,500	175,400	184,800	209,600	225,100	81,325	67,425	58,025	33,225	17,725	SF
Concourse Width	36-45 LF	45	45	45	45	45	(0-9)	(0-9)	(0-9)	(0-9)	(0-9)	LF
Sterile (Int'l Arrivals) Circulation	38,450 SF	13,100	22,200	29,600	36,400	43,300	25,350	16,250	8,850	2,050	(4,850)	SF
Holdrooms:												
Regional Aircraft (Groups II & III)	SF	19,200	17,600	16,800	16,000	14,400						SF
Narrowbody (Group III)	SF	31,500	37,000	46,300	50,000	61,100						SF
B757 (Group IIIa)	SF	12,000	21,600	28,800	28,800	24,000						SF
Widebody (Group IV)	SF	20,000	22,800	22,800	28,500	28,500						SF
B747/A340 (Group V)	SF	35,600	31,200	22,300	35,600	44,500						SF
A380 (Group VI)	SF	0	0	0	0	0						SF
Total Holdroom Area	160,910 SF	118,300	130,200	137,000	158,900	172,500	42,610	30,710	23,910	2,010	(11,590)	SF
Subtotal	460,055 SF	323,100	358,000	381,600	439,000	477,700						SF
DOMESTIC BAGGAGE CLAIM												
Claim Frontage Required	- LF	760	690	690	720	750						LF
Claim Units	9 units	4	4	4	4	4	5	5	5	5	5	units
Claim Frontage Programmed	1,710 LF	760	760	760	760	760	950	950	950	950	950	LF
Baggage Claim Area	52,900 SF	26,600	26,600	26,600	26,600	26,600	26,300	26,300	26,300	26,300	26,300	SF
FEDERAL INSPECTION SERVICES												
Primary Inspection:												
Double Inspection Counters	21 dbl. counters	16	20	23	28	34	5	1	(2)	(7)	(13)	dbl. counters
Counter & Queue Area	29,100 SF	20,300	25,400	29,200	35,600	43,200	8,800	3,700	(100)	(6,500)	(14,100)	SF
Baggage Claim:												
Claim Frontage Required	- LF	1,360	1,330	1,570	1,920	2,340						LF
Claim Units	5 units	6	6	7	9	10	(1)	(1)	(2)	(4)	(5)	units
Claim Frontage Programmed	1,080 LF	1,380	1,380	1,610	2,070	2,300	(300)	(300)	(530)	(990)	(1,220)	LF
Baggage Claim Area	39,170 SF	48,300	48,300	56,400	72,500	80,500	(9,130)	(9,130)	(17,230)	(33,330)	(41,330)	SF
Subtotal	68,270 SF	68,600	73,700	85,600	108,100	123,700						SF

Table IV.3-7
EWR – Terminal Capacity Analysis – Terminal C

Terminal C

	Existing and Approved Buildings Through 2008 [1]	Recommended Facilities - Demand: Base Year Activity 2004	Recommended Facilities - Demand: Forecast Year Activity 2010	Recommended Facilities - Demand: Forecast Year Activity 2015	Recommended Facilities - Demand: Forecast Year Activity 2020	Recommended Facilities - Demand: Forecast Year Activity 2025	Projected Surplus / (Deficiency): Base Year Activity 2004	Projected Surplus / (Deficiency): Forecast Year Activity 2010	Projected Surplus / (Deficiency): Forecast Year Activity 2015	Projected Surplus / (Deficiency): Forecast Year Activity 2020	Projected Surplus / (Deficiency): Forecast Year Activity 2025	
AIRLINE SPACE												
ATO Offices	28,900 SF	21,600	21,000	21,900	25,200	28,800	7,300	7,900	7,000	3,700	100	SF
Airline Operations & Offices (excluding ATO)	218,850 SF	192,600	210,800	219,000	257,600	280,600	26,250	8,050	(150)	(38,750)	(61,750)	SF
Baggage Handling												
Estimated make-up capacity	400 carts/LD3s	275	301	313	368	401	125	99	87	32	(1)	carts/LD3s
Baggage Make-up area	111,000 SF	82,600	90,400	93,800	110,400	120,200	28,400	20,600	17,200	600	(9,200)	SF
Checked Baggage Screening	0 SF	32,000	32,000	32,000	35,200	41,600	(32,000)	(32,000)	(32,000)	(35,200)	(41,600)	SF
Baggage Claim Off-load	34,100 SF	25,000	25,000	27,500	32,500	35,000	9,100	9,100	6,600	1,600	(900)	SF
Airline Clubs & 1st/Bus. Class Lounges	50,180 SF	50,200	50,200	50,200	50,200	50,200	(20)	(20)	(20)	(20)	(20)	SF
Baggage Service Offices	9,380 SF	7,500	8,200	9,000	10,200	11,700	1,880	1,180	380	(820)	(2,320)	SF
Subtotal	452,410 SF	411,500	437,600	453,400	521,300	568,100						SF
CONCESSIONS												
Ground Services/Information Counter	230 SF	200	200	200	200	200	30	30	30	30	30	SF
Food/Beverage; Secure	65,090 SF	48,700	62,300	67,900	75,300	83,900	16,390	2,790	(2,810)	(10,210)	(18,810)	SF
News/Gift/Retail; Secure	45,480 SF	37,600	48,100	52,400	58,100	64,700	7,880	(2,620)	(6,920)	(12,620)	(19,220)	SF
Subtotal; Secure Concessions	110,570 SF	86,300	110,400	120,300	133,400	148,600	24,270	170	(9,730)	(22,830)	(38,030)	SF
Food/Beverage; Non-Secure	0 SF	5,400	6,900	7,500	8,400	9,300	(5,400)	(6,900)	(7,500)	(8,400)	(9,300)	SF
News/Gift/Retail; Non-Secure	640 SF	4,200	5,300	5,800	6,500	7,200	(3,560)	(4,660)	(5,160)	(5,860)	(6,560)	SF
Subtotal; Non-Secure Concessions	640 SF	9,600	12,200	13,300	14,900	16,500	(8,960)	(11,560)	(12,660)	(14,260)	(15,860)	SF
Duty Free	3,180 SF	5,600	8,100	9,900	12,000	14,600	(2,420)	(4,920)	(6,720)	(8,820)	(11,420)	SF
Other Services	280 SF	6,600	8,500	9,300	10,300	11,400	(6,320)	(8,220)	(9,020)	(10,020)	(11,120)	SF
Concession Support Area	20,700 SF	27,000	34,800	38,200	42,700	47,800	(6,300)	(14,100)	(17,500)	(22,000)	(27,100)	SF
Subtotal	135,600 SF	135,300	174,200	191,200	213,500	239,100						SF
OTHER PUBLIC AREAS												
Public Seating and Meeter/Greeter Lobbies	4,380 SF	4,300	4,800	5,100	5,800	6,500	80	(420)	(720)	(1,420)	(2,120)	SF
Restrooms - Terminal Locations	6,555 SF	11,600	12,700	13,700	15,400	17,300	(5,045)	(6,145)	(7,145)	(8,845)	(10,745)	SF
Restrooms - Concourse Locations	17,320 SF	15,800	17,300	18,000	21,200	23,000	1,520	20	(680)	(3,880)	(5,680)	SF
Subtotal	28,255 SF	31,700	34,800	36,800	42,400	46,800						SF
Vacant spaces suitable for:												
	1,180 SF											SF

[1] - Sources:
Port Authority of NY & NJ -
area plans, December 2003
Continental Airlines -
existing areas, June 1999
Skidmore, Owings & Merrill -
terminal plans, December 2001
Hirsh Associates site visit, May 2005
Hirsh Associates analysis

IV.3.5 Annual Airport Terminal Capacity

In total, using the key determinants, EWR would have a terminal capacity range of 19.4 - 28.1 million enplanements. Using the more effective capacities described for each terminal, the terminal capacity range is 19.4 - 25.8 million enplanements. See Table IV.3-8.

In summary, (million annual enplanement capacities):

	Minimum	Maximum	Effective Maximum	Based on
Terminal A	3.7	7.3	7.3	check-in & gates
Terminal B	3.4	5.3	4.5	gates & SSCP
Terminal C	12.3	15.5	14.0	check-in & SSCP
Total	19.4	28.1	25.8	

Table IV.3-8
EWR – Annual Capacity Estimates

Key Determinants of Annual Capacity

A. Domestic Equivalent Check-in Positions

	Existing Facilities (positions)	Design Hour Capacity (O&D enplanements)	Annual Capacity (domestic enplanements)
Terminal A	128	2,910	6.9
Terminal B	54	1,470	2.6
Terminal C	83	3,010	9.4
		Airport Total Capacity:	**18.9 million domestic**

B. International Equivalent Check-in Positions

	Existing Facilities (positions)	Design Hour Capacity (O&D enplanements)	Annual Capacity (international enplanements)
Terminal A	7	160	0.2
Terminal B	114	1,950	2.7
Terminal C	78	1,660	4.6
		Airport Total Capacity:	**7.5 million international**

C. Security Screening (SSCP) Lanes

	Existing Facilities (lanes)	Design Hour Capacity (O&D enplanements)	Annual Capacity (combined enplanements)
Terminal A	10	1,610	3.7
Terminal B	14	2,990	4.6
Terminal C	24	4,610	13.8
		Airport Total Capacity:	**22.1 million combined**

Table IV.3-8
EWR – Annual Capacity Estimates

Key Determinants of Annual Capacity

D. Contact Gates

	Existing Facilities (NBEG)	Design Hour Capacity (NBEG)	Annual Capacity (combined enplanements)
Terminal A	39.1	39.1	7.3
Terminal B	36.9	36.9	4.5
Terminal C	69.4	69.4	12.3
		Airport Total Capacity:	**24.1 million combined**

E. Holdrooms

	Existing Facilities (square feet)	Design Hour Capacity (EQA)	Annual Capacity (combined enplanements)
Terminal A	66,900	36.1	6.7
Terminal B	60,050	36.1	3.4
Terminal C	160,910	91.8	15.5
		Airport Total Capacity:	**25.6 million combined**

Table IV.3-9
EWR – Annual Capacity Estimates

Secondary Determinants of Annual Capacity

A. Domestic Baggage Claim

	Existing Facilities (linear feet)	Design Hour Capacity (O&D deplanements)	Annual Capacity (domestic enplanements)
Terminal A	1050	2,750	7
Terminal B	670	1,970	3.3
Terminal C	1710	5,130	19.2
		Airport Total Capacity:	**29.5 million domestic**

B. International Primary Inspection

	Existing Facilities (positions)	Design Hour Capacity (deplanements)	Annual Capacity (international enplanements)
Terminal A	0	0	0
Terminal B	30	3,440	4.5
Terminal C	21	2,470	4.3
		Airport Total Capacity:	**8.8 million international**

C. International Baggage Claim

	Existing Facilities (linear feet)	Design Hour Capacity (deplanements)	Annual Capacity (international enplanements)
Terminal A	0	0	0.0
Terminal B	1,505	2,410	3.2
Terminal C	1,080	1,810	3.1
		Airport Total Capacity:	**6.3 million international**

Table IV.3-10
EWR – Annual Capacity Estimates

Summary of Annual Capacity Estimates

Key Determinants -

	Million Annual Enplanements Based on:						Capacity Range	
	Check-in Positions			SSCP	Gates	Holdrooms		
	Dom.	Int'l	Combined	Lanes				
Terminal A	6.9	0.2	7.1	3.7	7.3	6.7	3.7 -	7.3
Terminal B	2.6	2.7	5.3	4.6	4.5	3.4	3.4 -	5.3
Terminal C	9.4	4.6	14.0	13.8	12.3	15.5	12.3 -	15.5
				Airport Total Capacity Range:			**19.4 -**	**28.1**
							million enplanements	

Secondary Determinants -

	Million Annual Enplanements Based on:				Capacity Range International	
	Baggage Claim			Primary Inspection		
	Dom.	Int'l	Combined	Int'l		
Terminal A	7.0	0.0	7.0	0.0	0.0 -	0.0
Terminal B	3.3	3.2	6.5	4.5	3.2 -	4.5
Terminal C	19.2	3.1	22.3	4.3	3.1 -	4.3
Airport Total Capacity Ranges:			**35.8 million enplanements**		**6.3 -**	**8.8**
					million international enplanements	

IV.4 On-Airport Roadway & Terminal Frontage Capacity

IV.4.1 On-Airport Roadways

Newark Liberty International Airport is unique relative to the three major airports operated by the Port Authority in that it was completed in the 1970's as one integrated terminal and internal roadway system design. The on-airport roadway system consists of a counterclockwise express roadway connecting with three level terminal frontages by a complex ramp system. The primary gateway to the airport, the express roadway and terminal frontages is provided by the ramp and connecting roadway segments known as the "throat". Brewster Road, which extends around the perimeter of the airport, provides access to daily parking facilities and the car rental concessions.

Since its initial construction, the on-airport roadway network has undergone and continues to undergo significant modification and enhancement to accommodate increasing air passenger demand. Most of these enhancements were undertaken as part of the Landside Access Project of the Newark International Airport Redevelopment Program. On-airport modifications implemented as part of this program include widening of the "throat" and development of an at-grade HOV frontage and circulation system. Also, while the original plan of each terminal was to accommodate departures on the upper level, arrivals on the mid-level and parking on the ground level, as first modified at Terminal C and now in progress at Terminal B, the mid-level has been reconfigured as a second departures level, with arrivals pickups transferred to the at-grade level. The overall layout of the Newark Liberty International Airport on-airport roadways is provided on Exhibit IV.4-1.

IV.4.2 Critical Roadway Segments

Six critical on-airport roadway segments were identified at Newark Airport, as illustrated on Exhibit IV.4-2. These segments include the four "throat" inbound and outbound roadways, the weaving express roadway from Terminal A to Terminal C and the roadway segment that carries exiting and recirculation traffic from Terminals A, B and the Terminal C arrivals level.

IV.4.3 On-Airport Roadway Capacity and Operations

In order to analyze the operations of each critical roadway segment under baseline as well as future forecast traffic levels, threshold values for LOS C through LOS E (the flow at the transition point to the next LOS, i.e. LOS C to LOS D) were derived for each critical segment as well as baseline 2004, forecast 2015 and 2025 AM and PM peak hour traffic volumes, as discussed in Section I.4. The LOS threshold values for each roadway segment, segment traffic volumes for 2004 baseline, 2015 and 2025 forecasts and segment levels of service under each traffic demand condition are provided in Table IV.4-1 for AM and PM peak hours, respectively.

Exhibit IV.4-1
EWR - Overall Layout

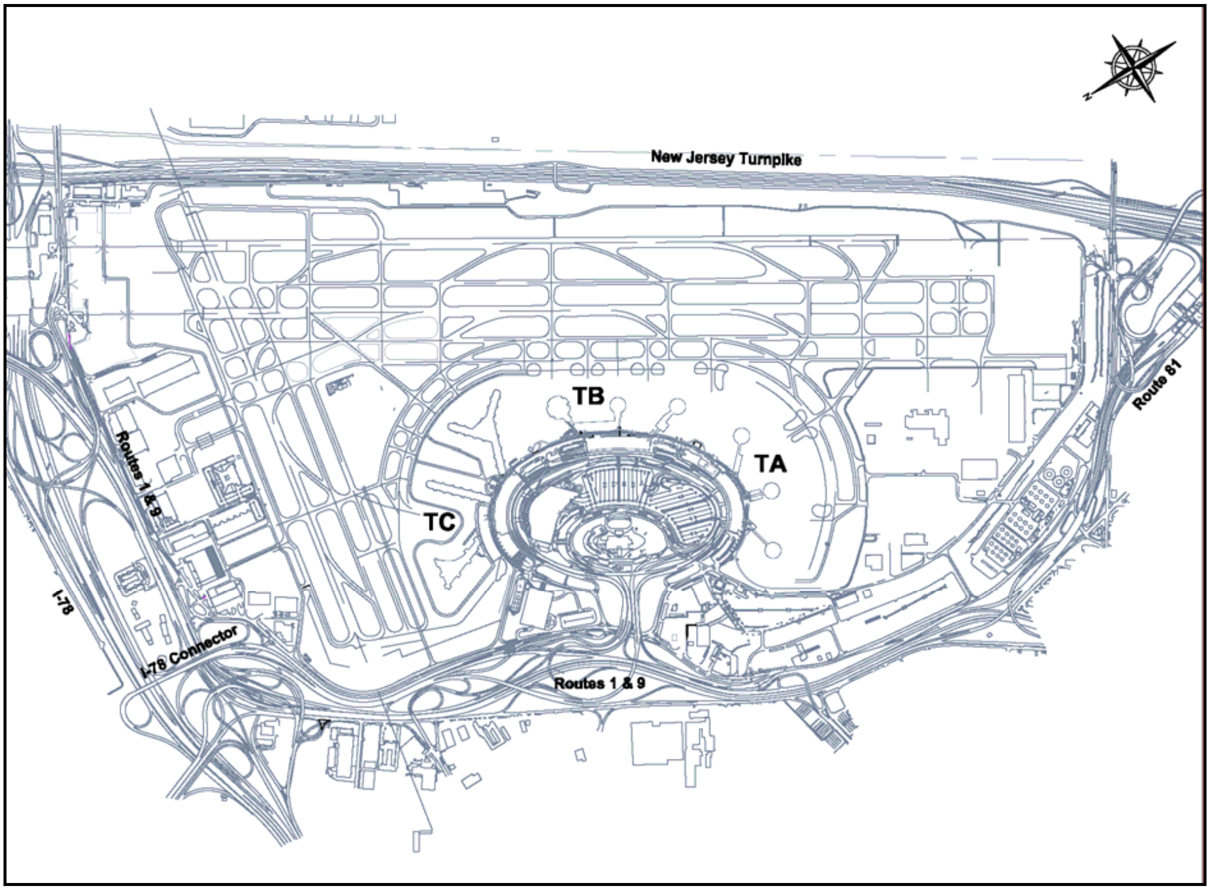


Exhibit IV.4-2
EWR On-Airport Critical Roadway Segments

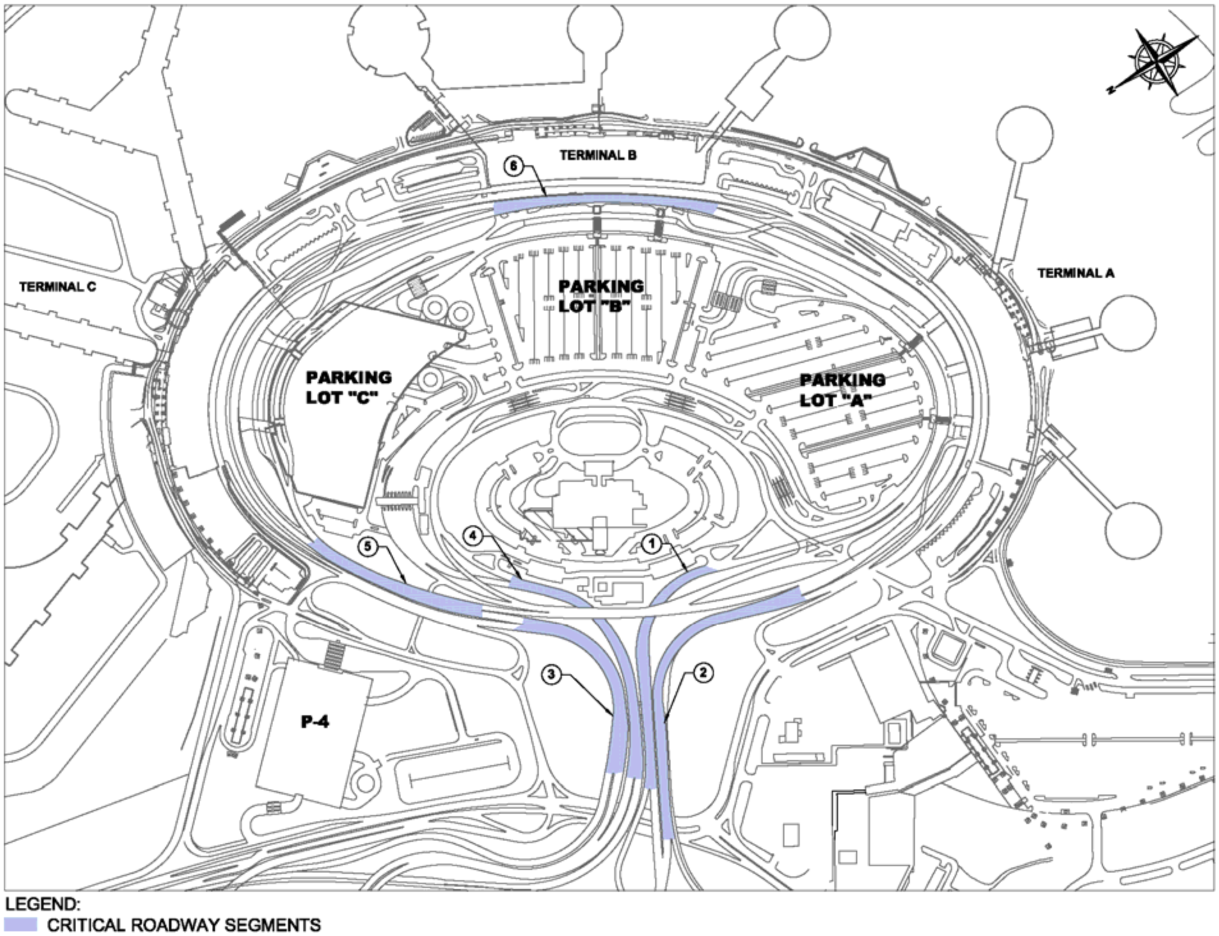


Table IV.4-1
EWR On-Airport Critical Roadway Segments (AM and PM)

AIRPORT ROADWAY DESCRIPTION		Base Year 2004 AM Peak Traffic (Vehicles/Hour)	Forecast 2015 AM Peak Traffic (Vehicles/Hour)	Forecast 2025 AM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
1	Airport Entrance to Arrivals Level	460 (≥ C)	970 (≥ C)	1,180 (≥ C)	2,340	3,100	3,800
2	Airport Entrance to Departures Level	2,060 (≥ C)	2,630 (≥ C)	3,220 (≥ C)	3,510	4,650	5,700
3	Airport Exit from all Terminals and P-4	1,840 (≥ C)	2,630 (≥ C)	3,210 (≥ C)	3,510	4,650	5,700
4	Airport Exit from all Parking and Tower Road	360 (≥ C)	760 (≥ C)	930 (≥ C)	3,510	4,650	5,700
5	From Terminals A, B and Terminal C Arrivals to Recirculation and Airport Exit	1,890 (≥ C)	2,740 (≥ C)	3,340 (≥ C)	3,510	4,650	5,700
6	To Terminal C Departures Level and from Terminal A Departures Level	1,210 (≥ C)	1,810 (≥ C)	2,210 (≥ C)	2,925	3,875	4,750

Notes:
1. (≥ C) = Level of Service A, B or C, (D) = Level of Service D, (E) = Level of Service E, (F) = Level of Service F

AIRPORT ROADWAY DESCRIPTION		Base Year 2004 PM Peak Traffic (Vehicles/Hour)	Forecast 2015 PM Peak Traffic (Vehicles/Hour)	Forecast 2025 PM Peak Traffic (Vehicles/Hour)	Level of Service Thresholds LOS "C" (Vehicles/Hour)	LOS "D" (Vehicles/Hour)	LOS "E" (Vehicles/Hour)
1	Airport Entrance to Arrivals Level	780 (≥ C)	1,200 (≥ C)	1,460 (≥ C)	2,340	3,100	3,800
2	Airport Entrance to Departures Level	2,170 (≥ C)	2,760 (≥ C)	3,370 (≥ C)	3,510	4,650	5,700
3	Airport Exit from all Terminals and P-4	2,090 (≥ C)	2,910 (≥ C)	3,550 (D)	3,510	4,650	5,700
4	Airport Exit from all Parking and Tower Road	1,180 (≥ C)	1,460 (≥ C)	1,780 (≥ C)	3,510	4,650	5,700
5	From Terminals A, B and Terminal C Arrivals to Recirculation and Airport Exit	2,760 (≥ C)	3,610 (D)	4,410 (D)	3,510	4,650	5,700
6	To Terminal C Departures Level and from Terminal A Departures Level	1,320 (≥ C)	2,000 (≥ C)	2,440 (≥ C)	2,925	3,875	4,750

Notes:
1. (≥ C) = Level of Service A, B or C, (D) = Level of Service D, (E) = Level of Service E, (F) = Level of Service F

As shown, all critical roadway segments operate at LOS C or better under 2004 baseline conditions as well as under 2015 forecast demand. Under 2025 forecast demand for the PM peak hour, one of the two main airport “throat” roadways (Segment 3) will operate in LOS D as well as the critical segment that carries exiting and recirculation traffic from Terminals A, B and the Terminal C arrivals level (Segment 5).

Additionally, it should be noted that other roadway operational deficiencies may be present with respect to the on-airport roadway network that were not identified under critical link analysis. Roadway segments in proximity to terminal frontages as well as intersections along Brewster Road, which are frequently controlled by traffic signals, were not analyzed in that they present a more localized condition rather than a representation of the functionality of the on-airport roadway network.

III.4.4 On-Airport Roadways – Recommendations Conclusions

Based upon the above analysis and findings, the following summary recommendations are proposed.

Airport Gateway Links

Based upon the above analysis, it appears that the airport gateway "throat" roadways have sufficient capacity to accommodate 2025 forecast passenger demand levels. One exiting segment is projected to operate in LOS D, while one of the entry "throat" roadways (Segment 2) is projected to operating at close to LOS D in 2025.

Circulation Roadways

While one critical express roadway segment will operate in LOS D under forecast 2025 PM peak hour demand, it appears that the on-airport express roadway network at Newark Airport has sufficient capacity to accommodate forecast demand within the planning horizon

IV.4.5 Terminal Frontage Roadways

Terminal A, B and C frontages at Newark Liberty International Airport (EWR) consist of three-level roadways that provide separate at-grade arrivals, mid-level arrivals or departures and upper-level departures roadways. The at-grade arrivals roadway generally provides frontage curb access for HOV and direct access to adjoining parking lots and/or garage. The existing mid-level arrivals frontage roadways at Terminals A and B generally provide "segmented" curb spaces with particular designations for cars, taxis, limousines, buses and shuttle vehicles. In addition, the mid-level arrivals roadway provides access to an off-street bus parking courtyard situated on the approach to each terminal. Terminal C provides a mid-level domestic departures roadway and upper level international departures roadway. The upper-level departures frontage roadways generally provide "common" curb spaces where no use restrictions are applied to any vehicles.

A major Terminal B modernization program is currently being developed at Newark Airport. As part of the proposed Terminal B redevelopment plan, Terminal B frontage roadways will be reconfigured to provide an upper-level international departures drop-off roadway, a mid-level domestic departures drop-off roadway, and an at-grade pick-up roadway for both domestic and international arrivals. The new 5-lane at-grade arrivals roadway will accommodate arrival passengers by automobiles and taxis, as well as HOV transit vehicles. The existing taxi pick-up lane will be relocated from its current location along the mid-level frontage roadway to the outermost lane of the 5-lane at-grade arrivals roadway. In addition, a second 3-lane arrivals roadway for "authorized black car" limousines will be provided between the 5-lane arrivals frontage sidewalk and the elevated express roadway.

IV.4.6 Terminal Frontage Capacity and Operations

Available frontage curb capacity of each CTA terminal was determined based upon a review of terminal record base plans and field measurements taken during field inventory surveys conducted in May 2006. A summary of existing terminal frontages at Newark Airport is shown in Table IV.4-2. As mentioned previously, all Newark Airport terminals have standard three level frontage operations for arrival and departure passengers. The at-grade arrivals roadways at Terminals A and B are currently designated for "permittee" vehicles only, and no significant curb usage was observed in May 2006. The existing Terminal C frontages also provide double curb loading/unloading lanes, thereby resulting in increased effective frontage capacity for at-grade arrivals and mid-level departures roadways. It is anticipated that proposed Terminal B at-grade arrivals roadway will also provide a double curb lane operation for increased frontage capacity. As such, the increased effective curb lengths are reflected in Table IV.4-2.

Future 2015 and 2025 frontage curb capacities of Newark Airport terminals are expected to be essentially the same as those of the 2004 baseline condition, except for Terminal B modernization that reflects the new frontage curb configuration of the proposed redevelopment plan. The three-level frontage operation proposed for Terminal B maximizes the throughput capacity of the frontage roadways similar to those previously implemented at Terminal C. Although the existing mid-level and upper-level frontages of Terminal C were observed during May 2006 field surveys in their operation as domestic and international departures roadways, respectively, the Port Authority is planning to enhance the frontage throughput capacity further by converting the mid-level to international departures and upper level to domestic departures. However, the daily passenger airline schedule indicates that the domestic departures demand at Terminal C is substantially greater than the international departures demand. Thus, the mid-level departures roadway of Terminal C with a longer frontage curb length of 1,149 feet (vs. 758 feet on the upper departures roadway) should be retained for domestic departing passengers. It is understood that Terminal A is also currently in the process of being considered for its possible redevelopment plan. For the purpose of this study, however, only the currently committed improvements at Terminals B and C are considered and evaluated in the frontage analysis.

Table IV.4-2
EWR Airport Frontage Curb Capacity Summary

	Available Curb (feet)		
Frontage Curb	**Terminal A ***	**Terminal B ****	**Terminal C *****
HOV			
Shared Ride/Shuttle	535	(350)	75 (75)
Bus	---	(550)	294 (344)
Total	**535**	**(900)**	**369 (419)**
Arrivals			
Car	526	(864)	634 (694)
Taxi	144	(360)	365 (365)
Shared Ride/Shuttle	---	---	143 (143)
Bus	---	---	---
Total	**670**	**(1224)**	**1142 (1202)**
Departures (Domestic)			
Car	771	(767)	1149
Taxi	---	---	---
Shared Ride/Shuttles	---	---	---
Bus	---	---	---
Total	**771**	**(767)**	**1149**
Departures (International)			
Car	n.a.	(806)	758
Shared Ride/Shuttles	n.a.	---	---
Bus	n.a.	---	---
Total	n.a.	**(806)**	**758**

* Mid-level frontage roadway of Terminal A is currently designated for Arrival passengers.
** Numbers in parentheses reflect proposed curb frontage available upon completion of the Terminal B Modernization Program. 2004 Terminal B data (prior to Modernization Program) not shown.
*** Numbers in parentheses represent additional 60' passenger car space and 50' bus stop that could be extended on the existing Terminal C Arrivals and HOV Frontages under current 2004 conditions.

The critical peak hours of frontage use at each Newark Airport terminal were identified from the 2004 and 2015 design day airline schedules. As a result, the peak hours of frontage curb activity for Newark Airport terminals varied widely throughout the typical day. Departing passengers generally arrive at the airport some time before their scheduled flight departure time and arriving passengers generally leave the frontage curb within the same hour as their flight arrival time. The start of the frontage curb peak hours for various Newark Airport terminals under the 2004 and 2015/2025 conditions are identified as follows:

	Arrivals		Departures	
Terminal	**2004**	**2015/2025**	**2004**	**2015/2025**
A	5:10 PM	8:10 PM	6:00 AM	5:50 AM
B	12:40 PM	6:30 PM	5:20 AM	11:40 AM*
			3:20 PM	6:30 PM**
C	4:00 PM	4:30PM	7:50 AM	5:50 PM*
			7:30 AM	6:40 AM**

* Domestic Departures
** International Departures

Comparisons of the available curb frontage capacity and peak hour usage at each terminal revealed the extent of deficiency or surplus under the 2004, 2015 and 2025 passenger demand conditions at Newark Airport, as shown in Table IV.4-3.

As shown, a substantial curb capacity shortfall for passenger car loading/unloading space exists on the Terminal A arrivals and departures roadways and the Terminal C at-grade arrivals roadway at Newark Airport under 2004 baseline, and is projected for 2015 and 2025 passenger demand conditions. In addition, a deficit of curb space for scheduled buses occurs on Terminal A arrivals roadway. A slight deficit is forecast for Terminal B at-grade arrivals for passenger cars under 2025 conditions and a slight deficit of shared ride/shuttle curb space is indicated at Terminal C at-grade HOV roadway. Thus, a redistribution of available frontage curb supply is necessary to accommodate the actual frontage demand at each terminal.

As mentioned previously, it should be noted that the projected frontage deficits (or surpluses) are based on theoretical passenger demand calculations. Thus, increasing the frontage lengths to satisfy the theoretical parking deficits is physically unattainable at many frontage curb locations.

Table IV.4-3
EWR Airport Frontage Analysis Summary

Terminal	Frontage Road	Available Frontage (feet)			Required Frontage (80%) (feet)			Theoretical Surplus (Deficit) (feet)		
		2004	2015	2025	2004	2015	2025	2004	2015	2025
A	Shared Ride/Shuttles	535	535	535	120	160	160	415	375	375
	Buses	0	0	0	0	0	0	0	0	0
	At-Grade HOV	**535**	**535**	**535**	**120**	**160**	**160**	**415**	**375**	**375**
	Cars/Limos/Car Service	526	526	526	725	925	1050	(199)	(399)	(524)
	Taxis	144	144	144	75	100	100	69	44	44
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	55	110	110	(55)	(110)	(110)
	Arrivals	**670**	**670**	**670**	**855**	**1135**	**1260**	**(185)**	**(465)**	**(590)**
	Car/Taxi/Limo/Bus	771	771	771	813	1220	1382	(42)	(449)	(611)
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures	**771**	**771**	**771**	**813**	**1220**	**1382**	**(42)**	**(449)**	**(611)**
B	Shared Ride/Shuttles	*	350	350	*	200	280	*	150	70
	Buses	*	550	550	*	55	110	*	495	440
	At-Grade HOV	*	**900**	**900**	*	**255**	**390**	*	**645**	**510**
	Cars/Limos/Car Service	*	864	864	*	825	1050	*	39	(186)
	Taxis	*	360	360	*	150	175	*	210	185
	Shared Ride/Shuttles	*	0	0	*	0	0	*	0	0
	Buses	*	0	0	*	0	0	*	0	0
	At-Grade Arrivals	*	**1224**	**1224**	*	**975**	**1225**	*	**249**	**(1)**
	Cars/Limos/Car Service	*	767	767	*	369	365	*	398	402
	Taxis	*	0	0	*	0	0	*	0	0
	Shared Ride/Shuttles	*	0	0	*	0	0	*	0	0
	Buses	*	0	0	*	0	0	*	0	0
	Departures (Domestic)	*	**767**	**767**	*	**369**	**365**	*	**398**	**402**
	Cars/Limos/Car Service	*	806	806	*	466	648	*	340	158
	Taxis	*	0	0	*	0	0	*	0	0
	Shared Ride/Shuttles	*	0	0	*	0	0	*	0	0
	Buses	*	0	0	*	0	0	*	0	0
	Departures (International)	*	**806**	**806**	*	**466**	**648**	*	**340**	**158**
C	Shared Ride/Shuttles	75	75	75	80	80	120	(5)	(5)	(45)
	Buses	294	344	344	110	110	165	184	234	179
	At-Grade HOV	**369**	**419**	**419**	**190**	**190**	**285**	**179**	**229**	**134**
	Cars/Limos/Car Service	634	694	694	1100	1300	1625	(466)	(606)	(931)
	Taxis	365	365	365	175	200	250	190	165	115
	Shared Ride/Shuttles	143	143	143	0	0	0	143	143	143
	Buses	0	0	0	0	0	0	0	0	0
	At-Grade Arrivals	**1142**	**1202**	**1202**	**1275**	**1500**	**1875**	**(133)**	**(298)**	**(673)**
	Cars/Limos/Car Service	1149	1149	1149	1126	1163	1233	23	(14)	(84)
	Taxis	0	0	0	0	0	0	0	0	0
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures (Domestic)	**1149**	**1149**	**1149**	**1126**	**1163**	**1233**	**23**	**(14)**	**(84)**
	Cars/Limos/Car Service	758	758	758	443	471	693	315	287	65
	Taxis	0	0	0	0	0	0	0	0	0
	Shared Ride/Shuttles	0	0	0	0	0	0	0	0	0
	Buses	0	0	0	0	0	0	0	0	0
	Departures (International)	**758**	**758**	**758**	**443**	**471**	**693**	**315**	**287**	**65**

Note: The deficits indicated are theoretical only. The large deficits indicated are physically unattainable. Operational considerations must be studied to rectify the frontage shortages.
* = Terminal B data (prior to Modernization Program) not shown.

IV.4.7 Terminal Frontage Roadways – Conclusions and Recommendations

Based on the results of foregoing analyses, it is determined that significant frontage capacity shortfall is indicated on the Terminal A arrivals and departures roadways and Terminal C at-grade arrivals roadway for passenger demand projected between 2004 and 2025. The possible redistribution of available frontage curb supply and mitigation measures were considered as follows:

- For Terminal A, no reserve capacity is available on the arrivals roadway to provide additional car loading/unloading space. Therefore, a special consideration should be given to the feasibility of widening the mid-level arrivals roadway to provide a double curb lane operation, thereby resulting in effective passenger curb length of 842 feet. In addition, a deficit for bus stop on the arrivals frontage roadway might be accommodated at the ground transportation courtyard situated at the south end of each terminal. Additional passenger car space for arrivals may be designated on the at-grade arrivals roadway as part of the future Terminal A modernization program.

- For Terminal B, the current redevelopment plan would mitigate a minor deficit of passenger car curb length by widening the mid-level domestic departures roadway to provide a double lane operation, as was done for Terminal C frontage roadway. However, no reserve capacity is available on at-grade arrivals roadway to alleviate the passenger car shortage of 186 feet projected for 2025 conditions.

- For Terminal C, a deficit of passenger car curb space on at-grade arrivals roadway cannot be mitigated. A slight deficit for passenger car curb space on the domestic departures roadway may be readily accommodated by the reserve capacity on the international departures roadway through the use of a variable message sign (VMS) panel located on the approach to split between the mid-level and upper level departures roadways. The shortage of shared ride/courtesy shuttles on at-grade HOV roadway also should be considered for possible processing at the ground transportation courtyard.

IV.5 On-Airport Vehicle Parking Capacity

IV.5.1 On-Airport Vehicle Parking Facilities

An inventory of existing short- and long-term parking facilities at Newark Liberty International Airport was obtained from the on-airport capacity database. For the purpose of this study, the actual public parking capacity based on current operating conditions is considered to represent the baseline condition. The on-airport parking evaluation is directed towards the public parking needs of airline passengers and airport employees. The assessment of tenant parking at the various individual properties is not addressed in this study. Public parking is primarily intended for airline passengers and their meeters-greeters and is classified as long-term (longer than 24 hours) and daily (24 hours or less) spaces. Locations of the existing on-airport parking facilities are shown on Exhibit IV.5-1. A total supply of 22,534 parking spaces was identified at eleven parking facilities located throughout Newark Airport (see Table IV.5-1).

Exhibit IV.5-1
EWR – Parking Facilities

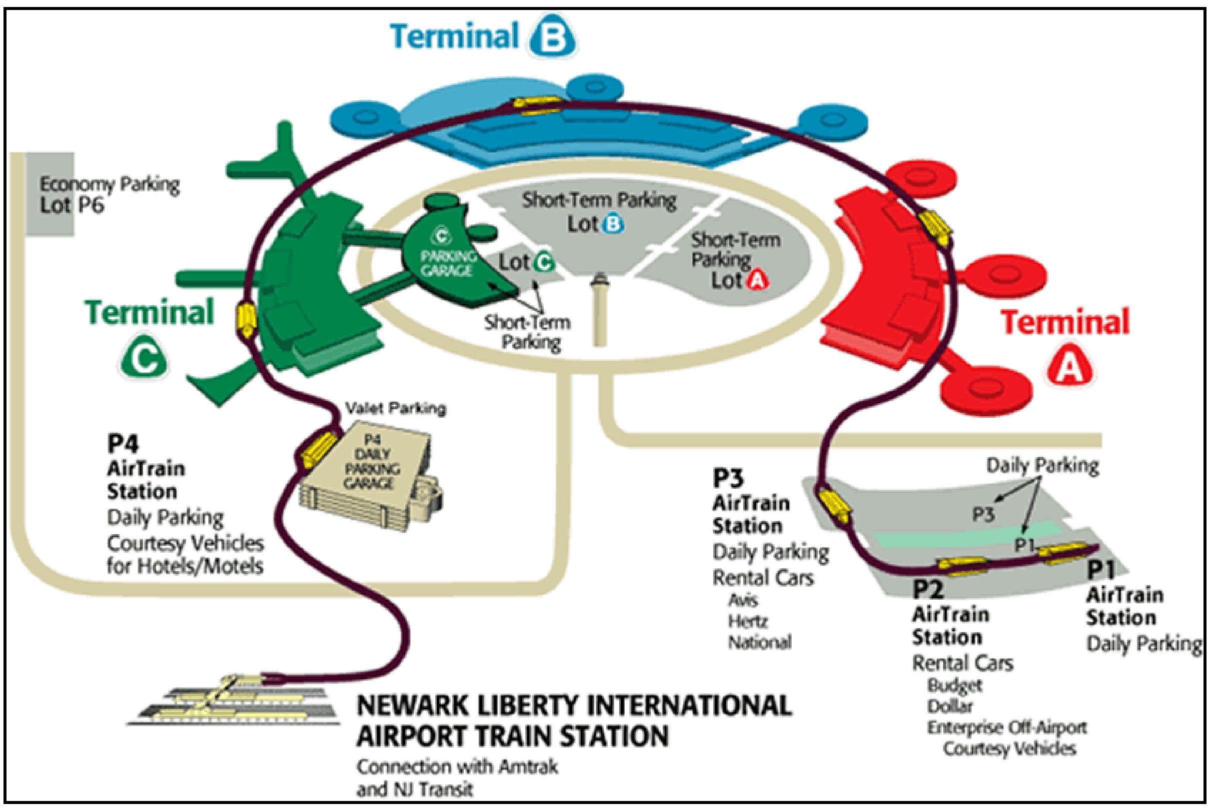


Table IV.5-1
EWR Airport Parking Summary

Parking		Terminal	Supply			Parking Occupancy			Surplus (Deficit)		
Lot	Color		2004	2015	2025	2004	2015	2025	2004	2015	2025
A-B-C		Terminal Short-Term Parking	6,554	6,554	6,554	3,277	4,227	5,159	3,277	2,327	1,395
P1-P3		Daily Parking	3,714	3,714	3,714	2,748	3,545	4,327	966	169	(613)
P4		Daily Parking Garage	2,994	2,994	2,994	2,877	3,712	4,530	117	(718)	(1,536)
P6		Economy Parking	4,579	4,579	4,579	4,579	5,907	7,209	0	(1,328)	(2,630)
P7		Economy Parking	1,076	1,076	1,076	979	1,263	1,542	97	(187)	(466)
P4		Valet (P4 Level 1 & Outer Lot)	721	721	721	447	577	704	274	144	17
		SUB-TOTAL	19,638	19,638	19,638	14,907	19,231	23,471	4,731	407	(3833)
P8		Employee Parking (Lot F)	2,896	2,896	2,896	2,751	3,549	4,331	145	(653)	(1435)
		TOTAL (EWR)	22,534	22,534	22,534	17,658	22,780	27,802	4,876	(246)	(5268)

A total of 6,554 short-term parking spaces are provided conveniently at Lots A, B and C near the adjacent CTA terminals. Daily Lots P1 to P3 and Daily Parking Garage 4 provide an additional 6,708 spaces. The economy Lots P6 and P7, which are located further away from CTA but accessible by AirTrain service, have the lowest parking fees and provide 5,655 spaces. Free courtesy buses transfer passengers between Lot P6 and Terminals A, B and C with a total travel time of approximately 20 minutes. The courtesy buses run every 20 minutes from 5:00 AM to midnight and every 20 minutes from midnight to 5:00 AM. The Economy Lot P7 is located at the easterly boundary of Newark Airport at New Jersey Turnpike (I-95). The employee Lot P8 (Lot F) has a capacity of 2,896 spaces. The employee Lot 7 and new long-term Lot 9 are located in the northwest and southwest quadrants, respectively, of the New Jersey Turnpike and North Avenue interchange. In addition, there are several privately operated off-airport parking lots with a total capacity of over 6,000 spaces.

IV.5.2 On-Airport Parking Capacity and Operations

Parking occupancy data for all on-airport parking facilities were compiled by Five Star Parking in August 2005 and March 2006. The higher parking occupancy data from either month was used to represent current baseline design-hour parking demand at Newark Airport, as summarized in Table IV.5-1. Although the total existing on-airport parking supply is sufficient to accommodate current parking demand, all of the economy parking lots and daily parking garage P4 were practically filled to their capacity during the baseline design hour period. For future 2015 and 2025 demand conditions, the projected parking demand would far exceed the available parking supply, especially under the 2025 horizon year, where a deficit of over 5,000 spaces is expected at Newark Airport. It is projected that the daily P4 Garage will have a deficit of approximately 700 spaces in 2015 and 1,550 spaces in 2025 and daily P1-P3 Parking Lot will have a deficit of more than 700 spaces in 2025. Employee Lot P8 will have a deficit of over 650 spaces in 2015 and over 1,400 spaces in 2025. Considering only public parking (not including Lot P8), the airport will have a deficit of approximately 3,600 spaces in 2025. By the Year 2025 the short-term Lots A, B C are the only facilities that will have a surplus of parking, of about 1,400 spaces.

The analysis also considered the possible addition of a future Economy Parking Lot P9, with a capacity of about 1200 spaces. However, with this lot in service, it is projected that there still will be a future economy parking shortfall. Looking at the on-airport parking spaces in total (and including the new Lot P9), the entire airport will have nearly 1,000 surplus design hour spaces in 2015, but a total shortfall of approximately 4,000 spaces in 2025. Additionally, it is likely that new development in the vicinity of the airport will slowly displace some of the existing off-airport parking lots. This activity would further exacerbate on-airport parking shortages, particularly in the economy lots.

IV.6 Airport Access / Off-Airport Roadway Capacity

IV.6.1 Introduction

Landside access to Newark Liberty International Airport benefits from an extensive system of adjacent highways, including state, interstate and tolled facilities, rail access to the Northeast Corridor and express as well as local bus service. Further, landside access has been significantly enhanced over the last 15 years as part of the Landside Access Project of the Newark International Airport Redevelopment Program. This program included construction of the Southern Access Roadway, the I-78 Connector, several peripheral airport access and circulation roadways, numerous connecting ramps and an extension of AirTrain Newark to connect with the Northeast Corridor. While the on-airport roadway network is a relatively compact multi-level circulation system, as described in Section IV.4, the off-airport access network is comprehensive and has been designed to provide air passengers with dedicated direct connections between the regional highway network and the airport gateway.

IV.6.2 Roadway Access

The two primary access corridors to Newark Airport in terms of regional access are the New Jersey Turnpike (I-95) and I-78. Interstate 78 extends east-west from Pennsylvania through north central New Jersey. Adjacent to the airport, I-78 is a complex cross-section of through, auxiliary and connecting roadways. Further, west, it converts to a six-lane local and four-lane express highway. The New Jersey Turnpike cuts a diagonal path from southwest to northeast New Jersey. Adjacent to the airport, the Turnpike is a 14-lane facility with interchanges immediately north and south of the airport. At the northern airport boundary the New Jersey Turnpike Extension serves as a four-lane continuation of I-78 to the Holland Tunnel and New York City. The mainline New Jersey Turnpike continues north, leading to the Lincoln Tunnel and ending with the connection with I-80 and I-95 to the George Washington Bridge.

Newark Airport is also served by several arterial state highways that provide a reasonable access option from a multi-county close-in area. US Routes 1&9 extend from Hudson County in northeast New Jersey south into Middlesex County where it splits into Route 1, which proceeds through central New Jersey to Trenton and Route 9 which proceeds southeasterly to the eastern coast of New Jersey, ultimately to Cape May. NJ Route 21 provides local access from Newark, Essex County and southern Passaic County to the north. It is projected that traffic volumes would increase from approximately 10 to 15 per cent on the primary access corridors serving Newark Airport over the next 20 years.

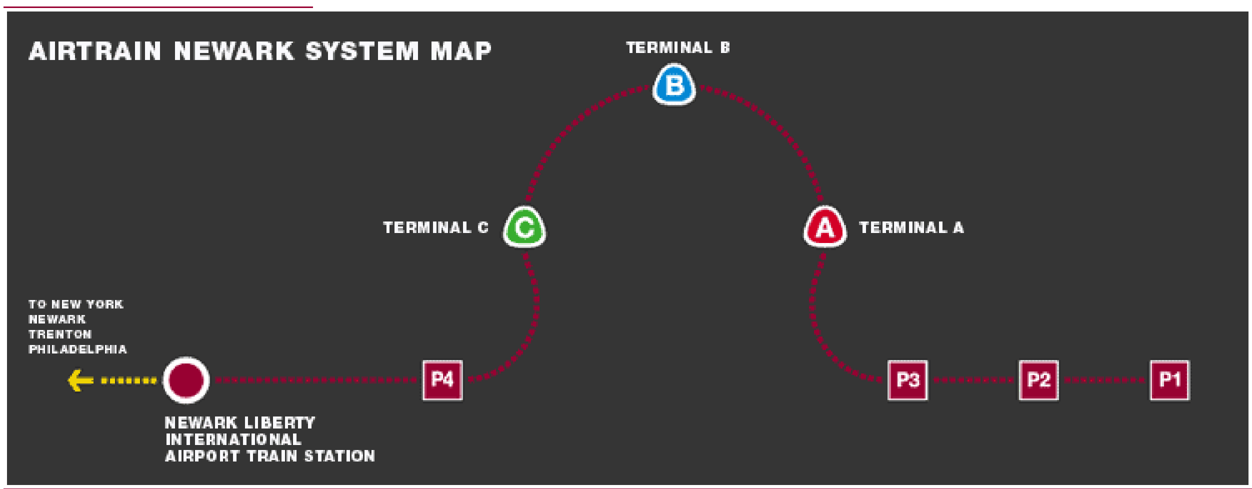
A complex system of connecting roadways and ramps are in-place to link this comprehensive regional access highway network to the airport, via the “throat” roadways as described in Section IV.4. The I-78 Connector extends north to an interchange with I-78 and also provides access from New Jersey Turnpike Interchange 14. Brewster Road, part of the Southern Airport Access Roadway, and NJ Route 81 connect with New Jersey Turnpike Interchange 13A. Direct connection ramps also link the airport with US Routes 1&9.

Congestion levels on these roadways are relatively low, at least in the vicinity of Newark Airport. The New Jersey Turnpike is generally not congested in this area, although segments to the north in Bergen County and to the south in Middlesex County experience frequent congestion. Current Annual Average Daily Traffic (AADT) on this 14-lane Turnpike section is approximately 180,000 vehicles per day. The New Jersey Turnpike I-78 Extension, with an AADT of from 50,000 to 60,000 vehicles per day, is also usually not congested westbound, but chronically congested as it approaches the Holland Tunnel in Jersey City. Localized problems have been noted on the I-78 auxiliary road leading to the airport I-78 Connector, but congestion usually does not occur on I-78 in the Newark Airport area. The AADT on 10-lane I-78 section west of the airport is approximately 160,000 vehicles per day.

IV.6.3 AirTrain Newark

The AirTrain at Newark Airport is a monorail type system that performs a multi-function role in satisfying both off-airport rail access and on-airport circulation. As shown on the system map (Exhibit IV.6-1), AirTrain provides an off-airport connection on the Northeast Corridor Line at the Newark Liberty International Airport Train Station.

Exhibit IV.6-1
EWR - AirTrain System Map



It also provides service to and connections between the Terminals A, B and C, service to and from several daily parking facilities and the car rental area. With the AirTrain connection to Newark Liberty International Airport Train Station, Newark Airport is accessible by either the NJTransit Northeast Corridor Line (running between Penn Station in New York and Trenton) or North Jersey Coast Line service (running between Penn Station in New York and Bay Head in Ocean

County) and the Amtrak Northeast Corridor Line (running between Washington, D.C. and Boston).

An analysis was performed of AirTrain usage to capacity under 2004 baseline as well as 2015 and 2025 forecast levels. Service capacity was derived based upon current AirTrain operations, assuming 3 minute headways, 6-car trains and a capacity of 78 passengers per train. Passenger volumes boarding and alighting at stations and passenger loads between stations were derived as described in Section I.6.2, assuming no change in mode share. Also, since it is not known at this time if additional parking capacity will be added to any daily lot served by AirTrain, forecast year AirTrain on and off passenger loads were not constrained by current parking lot capacities.

Exhibit IV.6-2 provides the passenger loads derived between stations for the 2004, 2015 and 2025 design day peak hour. As shown, the peak load point consistently occurs between Terminal B and Terminal C. The maximum load between these terminal stations increases from 788 passengers per hour (pph) in 2004 to 1,237 pph in 2025.

Passenger volume to capacity ratios between stations were also derived using the above passenger loads and service assumptions, as shown on Exhibit IV.6-3. In 2025, the maximum passenger volume to capacity ratio is projected increase from 0.51 in the 2004 baseline to 0.79 in 2025. This load level would indicate the need to consider adding an additional car to each train.

IV.6.4 Bus Access

Several bus transit options are available for travel to and from Newark Liberty Airport. Direct service to and from Manhattan is provided by Newark Liberty Airport Express generally every 15 minutes with stops in Manhattan at the Port Authority Bus Terminal, Bryant Park and Grand Central Terminal. Limited service is provided to Lower Manhattan. Additionally, Trans-Bridge Lines provides a limited scheduled service to central/western New Jersey, extending into Pennsylvania. Local bus service is provided to Newark Airport by NJTransit Route 62 from Union/Middlesex County and NJTransit Route 67 from Ocean County.

Baseline 2004 and future forecast usage of express bus service to Newark Airport was compared to service capacity levels. On a daily basis, assuming the mode share derived from the Departing Air Passenger Survey, it was estimated that approximately 50 per cent of the capacity of the airport express bus service is used today. By 2025, usage levels would rise to 75 per cent and likely require an increase in service.

Exhibit IV.6-2
EWR - AirTrain Passenger Load Volumes

		Rail Link	⇄	P4	⇄	C	⇄	B	⇄	A	⇄	P3	⇄	P2	⇄	P1
2004 - Base Year																
4:00 PM - 5:00 PM	←		212		462		693		738		620		298		199	
	→		440		532		788		633		317		121		43	
2015 Forecast																
4:00 PM - 5:00 PM	←		264		538		1,057		901		661		317		212	
	→		464		567		913		777		468		179		63	
2025 Forecast																
4:00 PM - 5:00 PM	←		317		616		1,237		1,051		730		351		234	
	→		508		630		1,116		951		569		217		77	

Exhibit II.6-3
EWR - AirTrain Passenger V/C Ratios

2004 - Base Year															
4:00 PM - 5:00 PM		0.14		0.30		0.44		0.47		0.40		0.19		0.13	
	Rail Link	⇄	P4	⇄	C	⇄	B	⇄	A	⇄	P3	⇄	P2	⇄	P1
		0.28		0.34		0.51		0.41		0.20		0.08		0.03	
2015 Forecast															
4:00 PM - 5:00 PM		0.17		0.34		0.68		0.58		0.42		0.20		0.14	
	Rail Link	⇄	P4	⇄	C	⇄	B	⇄	A	⇄	P3	⇄	P2	⇄	P1
		0.30		0.36		0.59		0.50		0.30		0.11		0.04	
2025 Forecast															
4:00 PM - 5:00 PM		0.20		0.39		0.79		0.67		0.47		0.22		0.15	
	Rail Link	⇄	P4	⇄	C	⇄	B	⇄	A	⇄	P3	⇄	P2	⇄	P1
		0.33		0.40		0.72		0.61		0.37		0.14		0.05	

IV.6.5 Off-Airport Transportation Improvements

Table IV.6-1 provides a description and status of off-airport transportation projects in the vicinity of or directly related to Newark Airport that are in some stage of study or have been listed as potential projects. Several significant projects are in the conceptual study phase that could significantly improve Newark Airport access by rail. The Port Authority has proposed extending PATH service from Newark Penn Station to Newark Airport and NJTransit is considering building a light rail line from its Elizabeth Northeast Corridor Station to the Airport as part of its Newark-Elizabeth Rail Link (NERL). It is also possible that if future ferry and connecting bus service from Manhattan to Jersey Gardens Mall is implemented, the connecting bus service would include Newark Airport.

Several roadway improvements in the vicinity of or directly related to Newark Airport are also programmed. The McClellan Street interchange and bridge project, which is one of the remaining SAARP projects and would provide a linkage between US Routes 1&9 and Brewster Road is programmed for 2009-2010 construction. Improvements are also programmed to the Haynes Avenue Bridge as well as I-78 in the vicinity of the airport over the next three to five years.

IV.6.6 Conclusions

As noted above, landside access to Newark Liberty International Airport benefits from an extensive system of adjacent roadways and rail access to the Northeast Corridor. Access in proximity to the airport, even during peak traffic periods, can be considered relatively reliable in terms of travel time. However, recurrent congestion is common on many New Jersey roadways, and especially at Hudson River crossings. Therefore, depending on trip specifics, extensive delays could still be expected for many air passengers traveling by road to Newark Airport during peak traffic periods. No major further improvements in road access are under consideration within the study planning horizon. Rail access to Newark Airport will likely be enhanced. Given the limited capacity of AirTrain Newark, it is likely that some capacity enhancement, supplementary or replacement system will be given more detailed study over the next ten years.

Table IV.6-1
EWR - Off-Airport Transportation Projects

Project	Description	Sponsors	Benefits	Status
PATH Extension from Newark Penn Station	Extend PATH service from Newark Penn Station	PANYNJ	Improve transit access, attractiveness and use	Not funded in current capital program
Airtrain Cars	Purchase additional cars for seven car consists	PANYNJ	Increase system capacity	Not funded in current capital program
Southern Access Roadway McClellan Street Interchange	Interchange and bridge reconstruction	NJDOT, PANYNJ	Improve airport access from US Route 1&9	2009-2010 construction
Haynes Avenue Bridge Reconstruction	Replace bridge, increase clearances	NJDOT	Improve access from Haynes Avenue, US Route 1&9	2007-2008 construction
I-78 Improvements	Reconstruction and safety improvements MP 53.7-58.5	NJDOT	Improve operations along primary airport access corridor	2008-2009 construction
NERL Elizabeth Segment	Provide light rail link from Northeast Corridor Elizabeth Station	NJTransit	Improve airport transit access	Funded for further study as part of Transit Rail Initiatives Program
NERL Phase 2	Newark Penn Station to airport	NJTransit	N/A	N/A

APPENDIX

APPENDIX A
Airfield Capacity & Demand Data

FAA REGIONAL AIR SERVICE DEMAND STUDY

Appendix A
Future Airfield Demand/Capacity

November 15, 2006

THE PORT AUTHORITY OF NY & NJ

Approach & Methodology

- Data Sources
- Runway Queue Model

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Approach

- Objective: Estimate existing and future annual and hourly capacity provided by the runway and taxiway systems at each airport
- Methodology should provide sufficient analysis to support high level policy decisions about the need to develop future runway and taxiway systems for the nine airport study area

Methodology

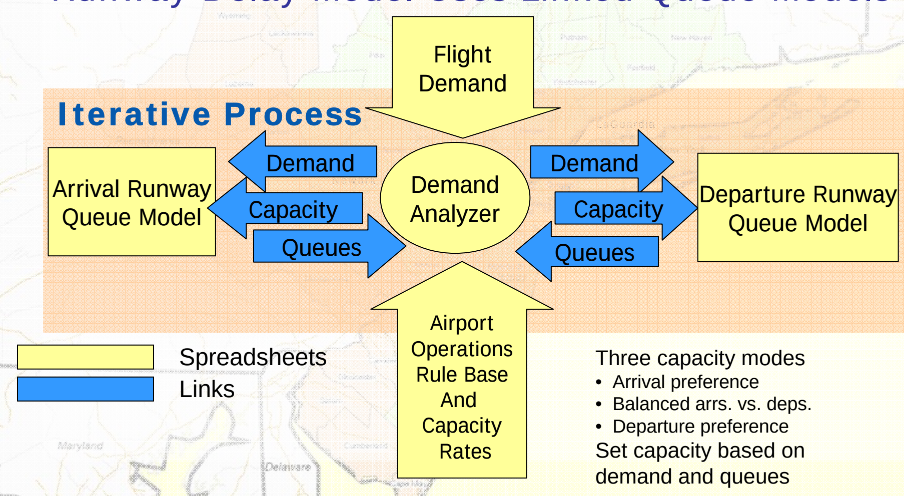
- Use queuing models that recognize:
  - The ability of ATC to vary capacity to favor either arrivals or departures (or balance it)
  - Account for the variability of capacity during various wind and weather conditions
  - The limited ability of the taxiway systems to provide queuing space for the runways
- Take advantage of previously conducted simulation studies to calibrate models
  - MITRE (as of 12/15/2005)
  - PANY&NJ for LGA and JFK
- Use of other databases for calibration
  - ASPM for delay metrics and capacity rates
  - CATER for throughput and demand

Methodology (2)

- Compute average annual and daily demand profile
  - Forecast of annual activity
  - Profile of average day scheduled demand (OAG + GA from CATER)
  - Profile of average day demand from 2015 forecast flight schedule
  - Interpolate profiles for other years from 2004 and 2015
  - Convert profiles to demand by five minute periods
- Configurations and use from CATER
  - Use configurations with more than 1% annual usage
  - Examine patterns of usage for second arrival or departure runway (EWR and JFK)
- Establish capacity rates for configurations from ASPM
  - 95th percentile rates
  - Evaluate capacity for arrival, departure and balanced flow preference
- Determine average annual capacity rates by time of day
- Apply queuing model to compute delays

Queue Model Description

Runway Delay Model Uses Linked Queue Models

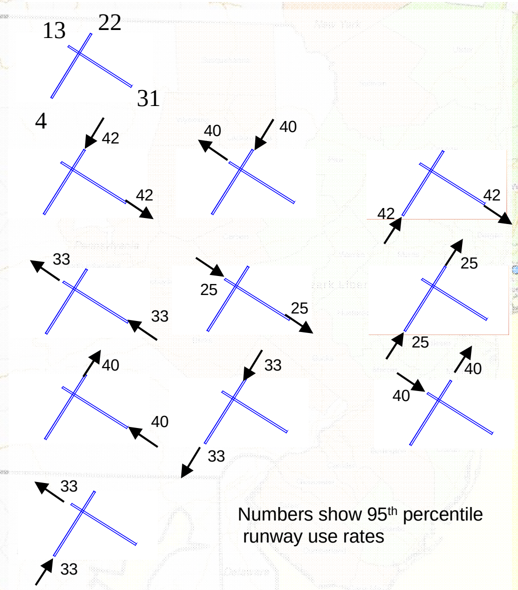


LGA AIRFIELD ANALYSIS

- Forecast Demand
- Runway Use
- Queuing Needs
- Delay Analyses
- Future Runway Capacity Needs

THE PORT AUTHORITY OF NY & NJ

LGA Configurations



Runways (A.D)	Observations	Percent of Year	Percent Airport Open
22.13	1,944	22%	24%
4.13	1,498	17%	18%
22.31	1,470	17%	18%
4.31	70	1%	1%
31.04	1,399	16%	17%
13.04	17	0%	0%
13.22	17	0%	0%
31.22	9	0%	0%
31.31	813	9%	10%
13.13	170	2%	2%
22.22	409	5%	5%
4.04	361	4%	4%
-	609	7%	0%
Total	8,784	100%	100%

Numbers show 95th percentile runway use rates

LGA Airport ASPM Data

95th Percentile Capacity Values by Configuration

Configuration	Percentage of Operations	Adjusted Percentage	Arrival Push ARR	Arrival Push DEP	Total	Departure Push ARR	Departure Push DEP	Total	Mixed Operations ARR	Mixed Operations DEP	Total	
22 | 13	27	29%	42	44	86	42	44	86	42	44	86	
4 | 13	20	22%	42	44	86	42	44	86	42	44	86	
22 | 31	20	22%	44	43	87	44	43	87	44	43	87	Questionable Accuracy
31 | 4	19	21%	44	43	87	44	43	87	44	43	87	Questionable Accuracy
31 | 31	6	7%	43	43	86	43	43	86	43	43	86	Not Accurate
	92	100%	42.9	43.5	86.4	42.9	43.5	86.4	42.9	43.5	86.4	

Based on 2004 ASPM

- ASPM does not provide representative data on lower capacity configurations
- Used CATER data to provide 95th percentile capacity estimates for lower capacity configurations
- Used CATER data to check 95th percentile capacity estimates from ASPM for high capacity configurations

LGA ASPM Summary

AAR/ADR Calculator : Summary (Hourly Source)

From 2004 To 2004 : 'LGA' : Calendar Year

Airport Efficiency Traffic Count :	402619	Conditions To Vector For Visual Approach	
OPSNET Operations :	405598	Ceiling :	3200
Percent Of Operations :	99	Visibility :	4

Actual Efficiency Counts

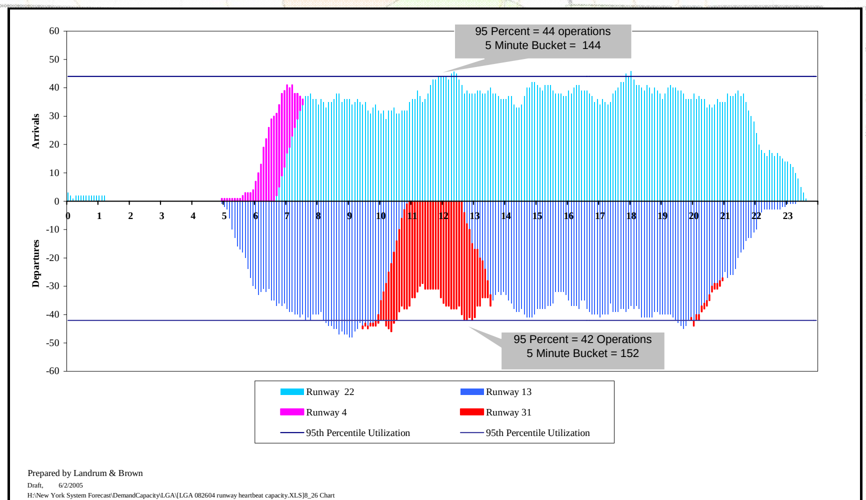
	Time Periods	Max	99th	95th	75th	Min	Median	Average
Departure	5490	59	47	44	39	0	35	33
Arrival	5490	49	44	42	38	0	35	33
Total Operations	5490	93	86	82	76	0	70	66

Facility Provided Rates

	Time Periods	Max	99th	95th	75th	Min	Median	Average
ADR	5490	42	40	38	37	10	34	33
AAR	5490	42	40	38	37	10	34	33
Total (ADR+AAR)	5490	84	80	76	74	20	68	67

LGA Runway Use Rates from CATER

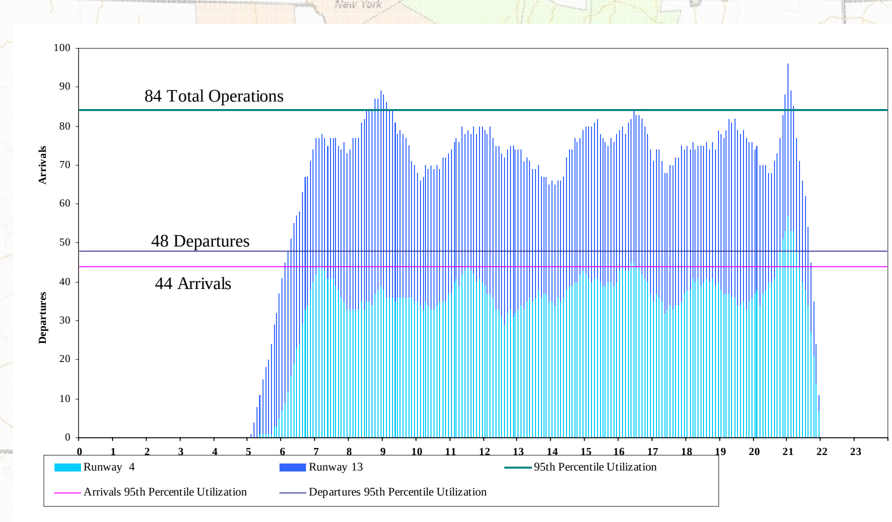
Arrive Runway 22 and Depart Runway 13



La Guardia International Airport	Actual Operations (Aug. 26, 2004) Rolling 60-Minute Operations Rate in 5 Minute Intervals	EXHIBIT 2

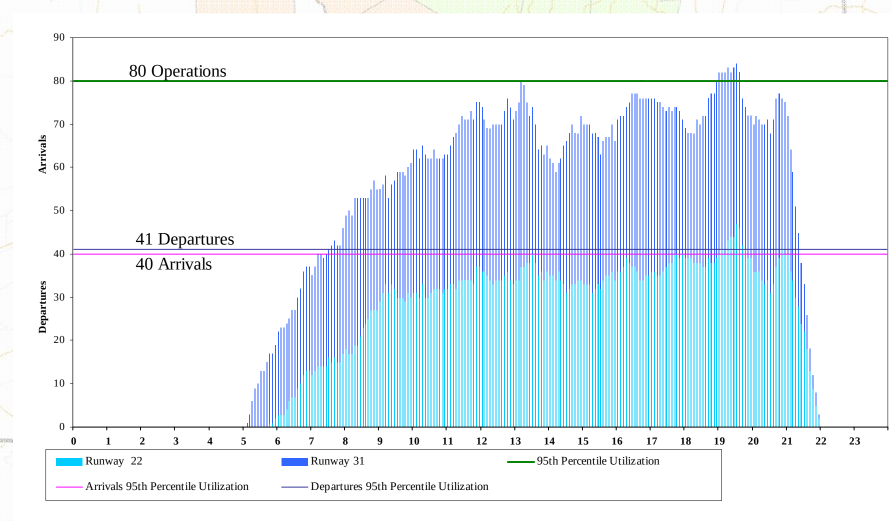
LGA Runway Use Rates from CATER

Arrive Runway 4 and Depart Runway 13



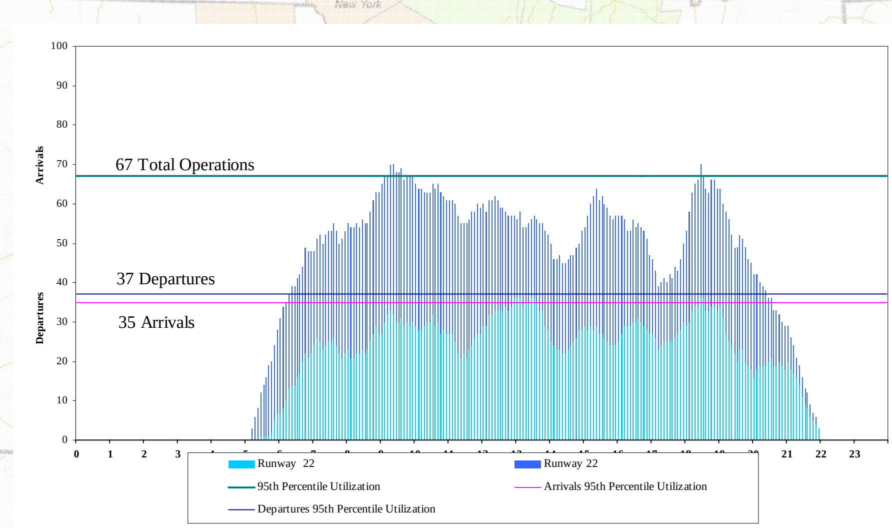
LGA Runway Use Rates from CATER

Arrive Runway 22 and Depart Runway 31

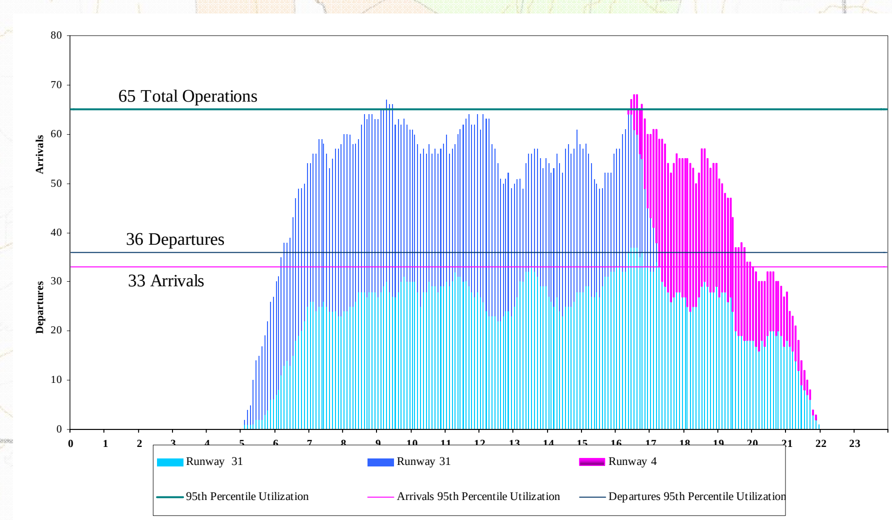


LGA Runway Use Rates from CATER

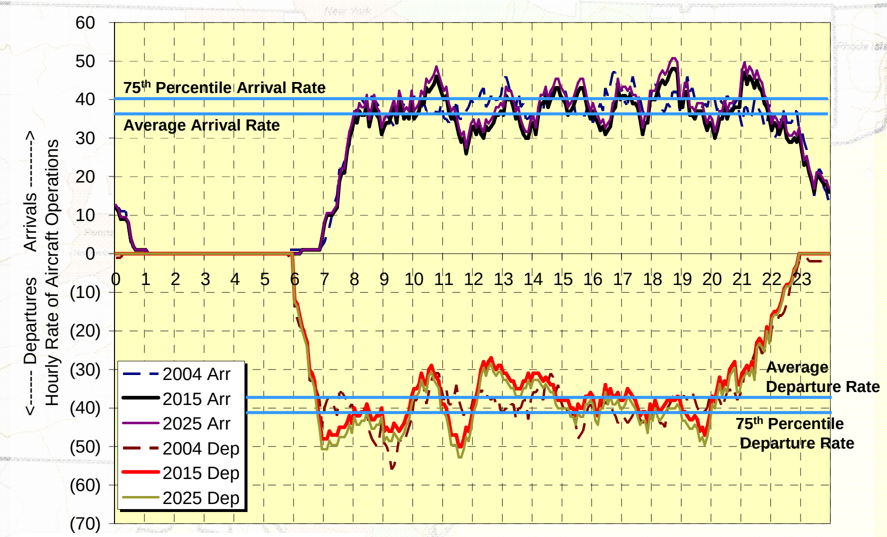
Arrive and Depart Runway 22



LGA Runway Use Rates from CATER
Arrive and Depart Runway 31

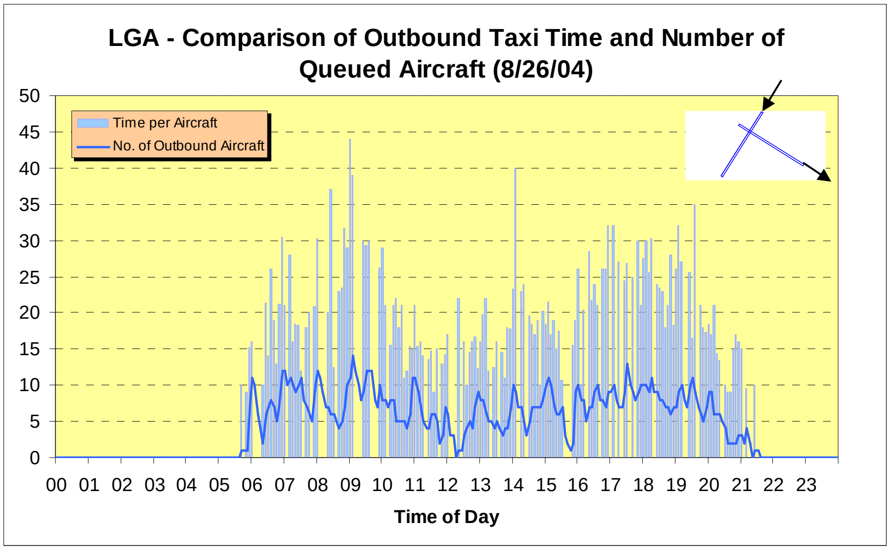


LGA Forecast of Future Demand
Hourly Rate of Arrivals and Departures



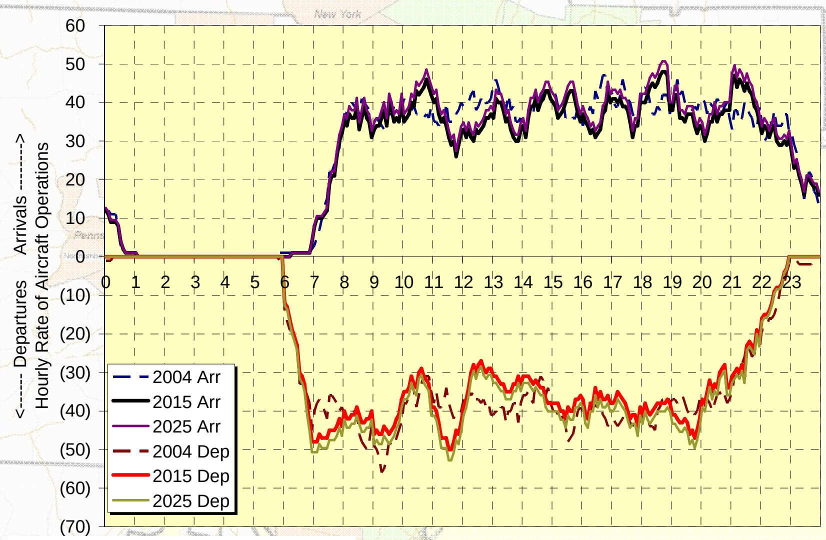
2004 Schedule completion rate = 97%

LGA Taxiway Use



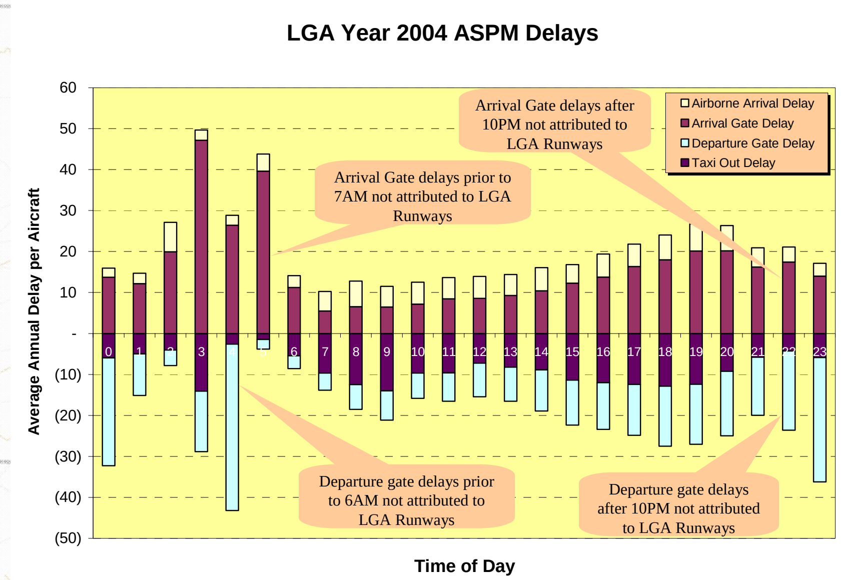
LGA Forecast of Future Demand

Hourly Rate of Arrivals and Departures



2004 Schedule completion rate = 97%

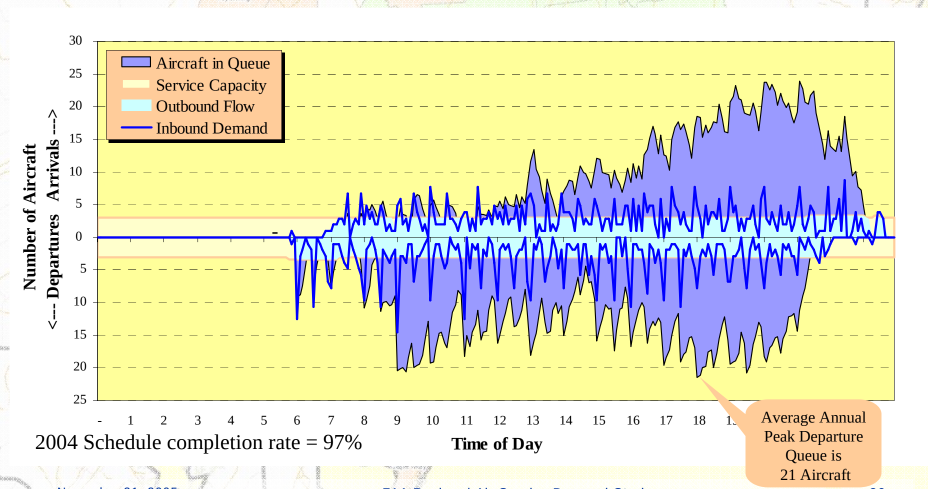
LGA Runway Delays



2004 LGA Queuing Analysis

Average Annual Capacity →

	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	36.5	37.8	40	36	36	40
5 Minute	3.0	3.1	3.3	3.0	3.0	3.3
20 Minute	12.2	12.6	13.3	12.0	12.0	13.3

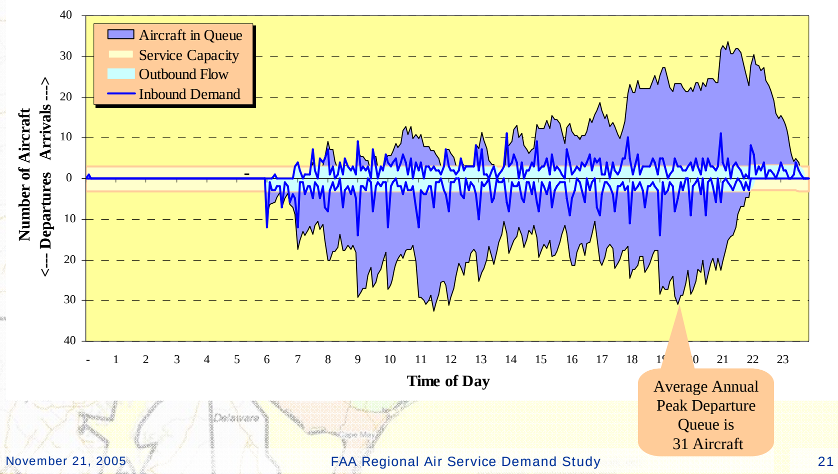


2004 Schedule completion rate = 97%

2015 LGA Queuing Analysis

- Increased Volume of B-757
- Reduced Volume of Props
- Runway Capacity Declines by 2%

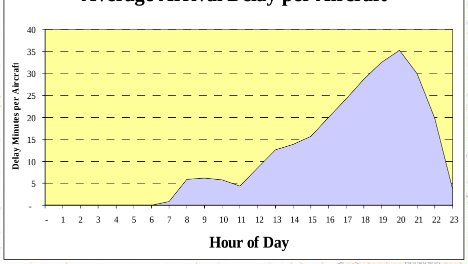
	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	36	37	39	35	35	39
5 Minute	3.0	3.1	3.3	2.9	2.9	3.3
20 Minute	11.9	12.3	13.1	11.8	11.8	13.1



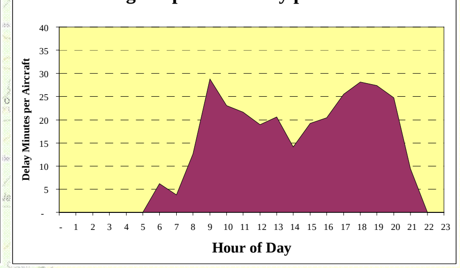
2004 LGA Runway Delays

Average Annual Arrival Delay = 16.3 (ASPM = 16.4) Min./Aircraft
Average Annual Departure Delay = 18.9 (ASPM = 19.5) Min./Aircraft

Average Arrival Delay per Aircraft



Average Departure Delay per Aircraft



Number of Delayed Aircraft

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
62	106	101	81	63	57	69	64
10.3%	17.5%	16.7%	13.4%	10.5%	9.4%	11.4%	10.7%

Number of Delayed Aircraft

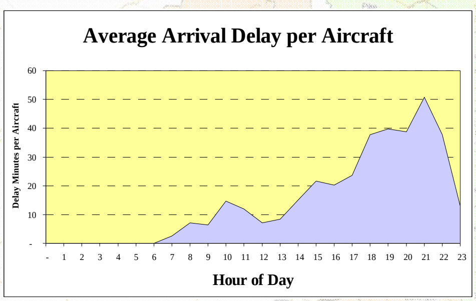
No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
43	46	42	108	127	127	92	21
7.1%	7.6%	7.0%	17.8%	21.0%	21.0%	15.1%	3.4%

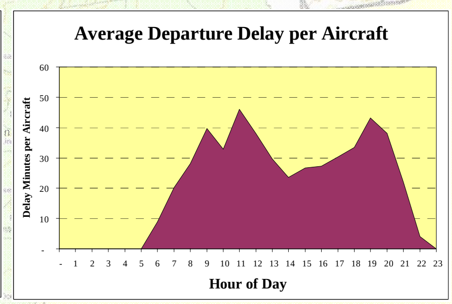
34% of arrivals delayed more than 15 Min.

61% of departures delayed more than 15 Min.

2015 & 2025 LGA Runway Delays

	2004	2015 & 2025
Average Annual Arrival Delay	= 16.3 (ASPM = 16.4)	21.3 Min./Aircraft
Average Annual Departure Delay	= 18.9 (ASPM = 19.5)	30.2 Min./Aircraft





Number of Delayed Aircraft (arrivals)

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
40	89	83	73	81	48	12	175
6.6%	14.9%	13.8%	12.1%	13.5%	7.9%	2.1%	29.1%

Number of Delayed Aircraft (departures)

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
3	16	31	19	57	101	130	243
0.5%	2.6%	5.2%	3.2%	9.6%	16.8%	21.6%	40.5%

53% of arrivals delayed more than 15 Min.

78% of departures delayed more than 15 Min.

LGA Runway Capacity Needs

- To maintain existing levels of service:
  - Regain the 2% of capacity lost to wake-turbulence separations for B-757 (and smaller prop and jet aircraft) or,
  - Two operations per hour (all-weather annual average) of runway capacity, or
  - Departure queue management plan on all configurations for 30+ aircraft

JFK AIRFIELD ANALYSIS

- Runway Use
- Forecast Demand
- Queuing Needs
- Delay Analyses
- Future Runway Capacity Needs

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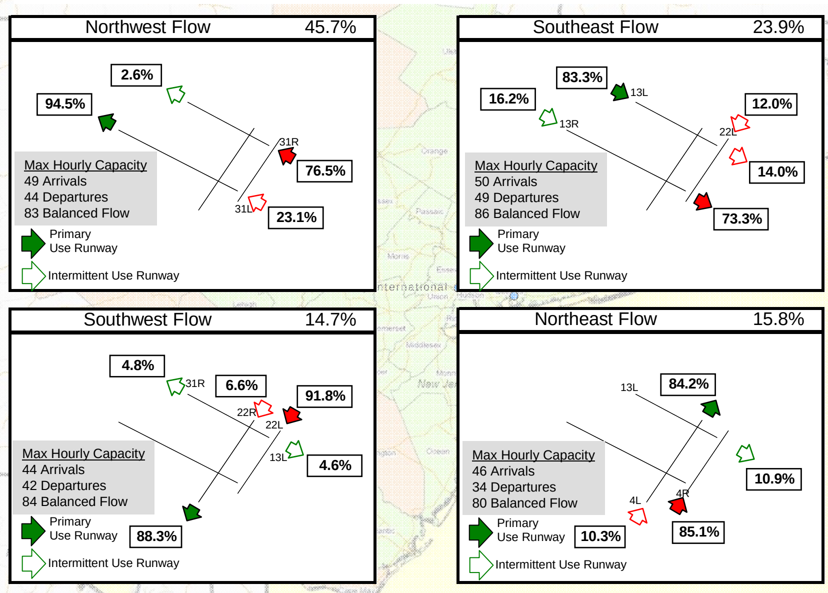
JFK Runway Configurations



JFK Airport ASPM Data

95^{th} Percentile Capacity Values by Configuration

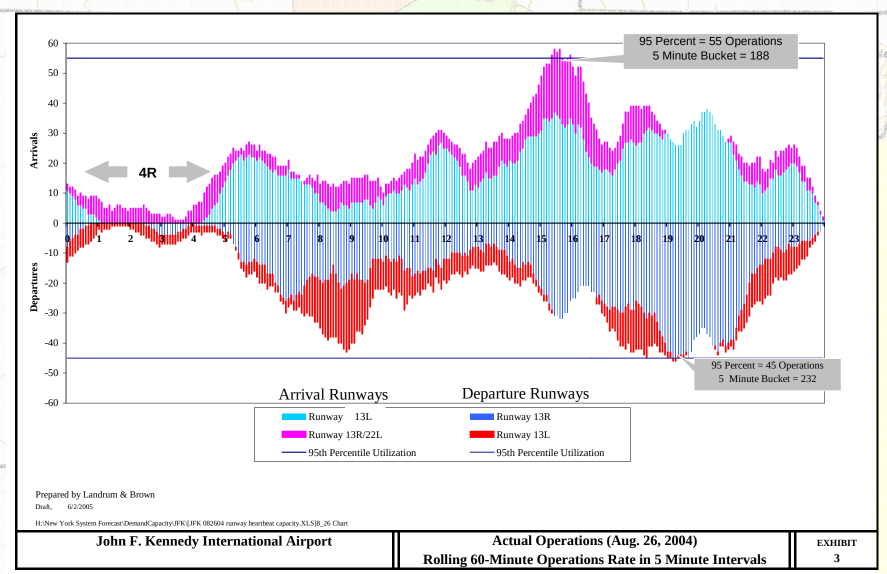
Configuration	Percentage of Operations	Normalized	Arrival Push Arrivals	Arrival Push Departures	Arrival Push Total	Departure Push Arrivals	Departure Push Departures	Departure Push Total	Mixed Operations Arrivals	Mixed Operations Departures	Mixed Operations Total
31R | 31L	42%	45%	49	37	86	39	44	83	39	44	83
13R | 13R	24%	26%	50	42	92	37	49	86	37	49	86
22L | 22R	12%	13%	44	40	84	35	42	77	44	40	84
4R | 4L	12%	13%	46	34	80	46	34	80	46	34	80
4R | 31L	3%	3%	25	33	58	25	46	71	25	33	58
	93%	100%	47.5	38.2	85.6	38.4	43.8	82.2	39.6	43.1	82.7

Based on 2004 ASPM data.

- Based upon spot comparisons of ASPM and CATER data ASPM provides reasonable estimates of 95^{th} percentile capacity utilization for JFK Airport
- No additional analysis of CATER data required

Example CATER Analysis

JFK Runway Use for Southeast Flow



JFK ASPM Summary

AAR/ADR Calculator : Summary (Hourly Source)

From 2004 To 2004 : 'JFK' : Calendar Year

		Conditions To Vector For Visual Approach	
Airport Efficiency Traffic Count :	321825		
OPSNET Operations :	332816	Ceiling :	2000
Percent Of Operations :	96	Visibility :	4

Actual Efficiency Counts

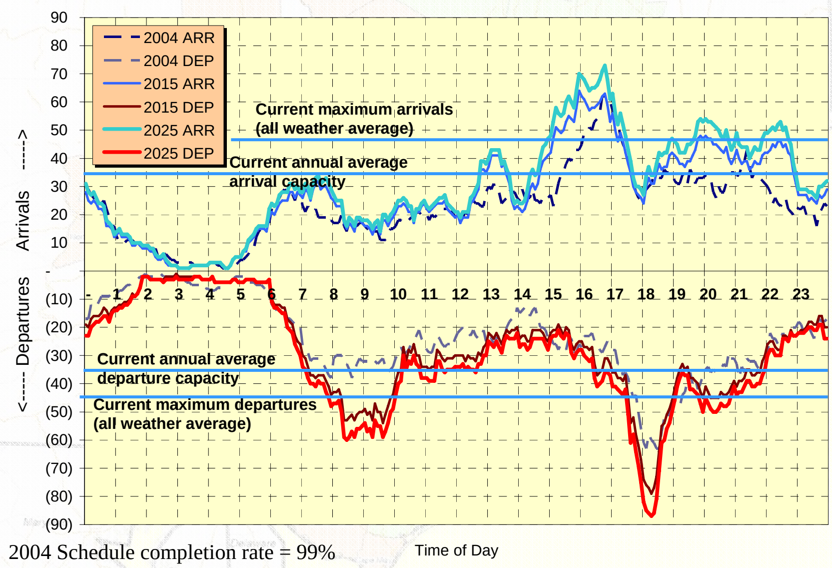
	Time Periods	Max	99th	95th	75th	Min	Median	Average
Departure	5490	58	51	44	31	0	23	24
Arrival	5490	63	51	44	29	1	22	22
Total Operations	5490	90	79	72	58	2	45	47

Facility Provided Rates

	Time Periods	Max	99th	95th	75th	Min	Median	Average
ADR	5490	58	52	44	42	10	39	37
AAR	5490	56	56	56	35	8	33	34
Total (ADR+AAR)	5490	93	88	88	79	24	75	72

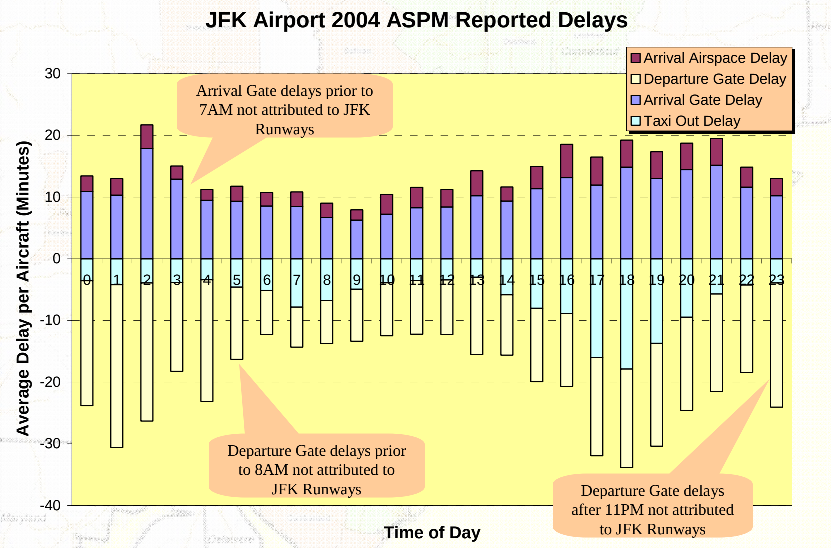
JFK Forecast of Future Demand

Hourly Rate of Arrivals and Departures

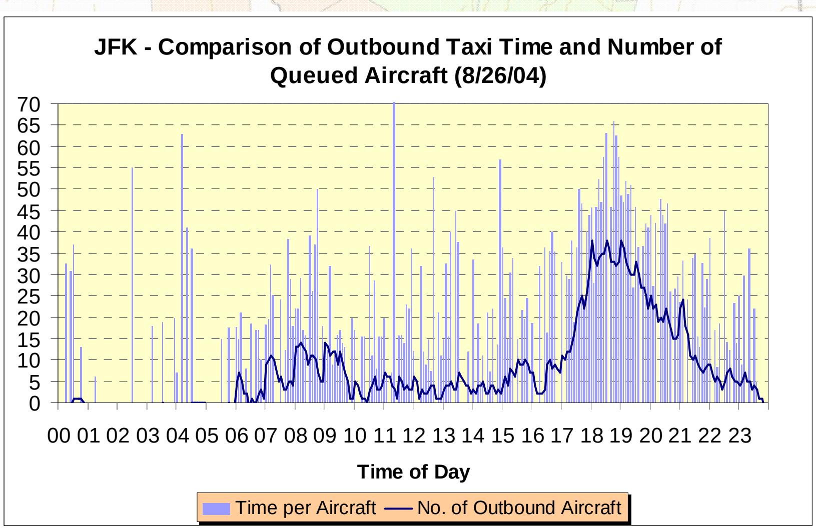


2004 Schedule completion rate = 99%

JFK Runway Delays



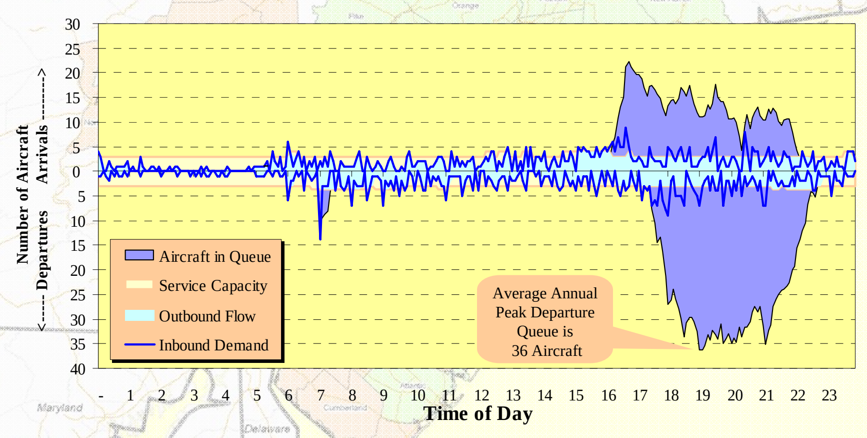
JFK Taxiway Analysis



2004 JFK Queuing Analysis

Average Annual Capacity →

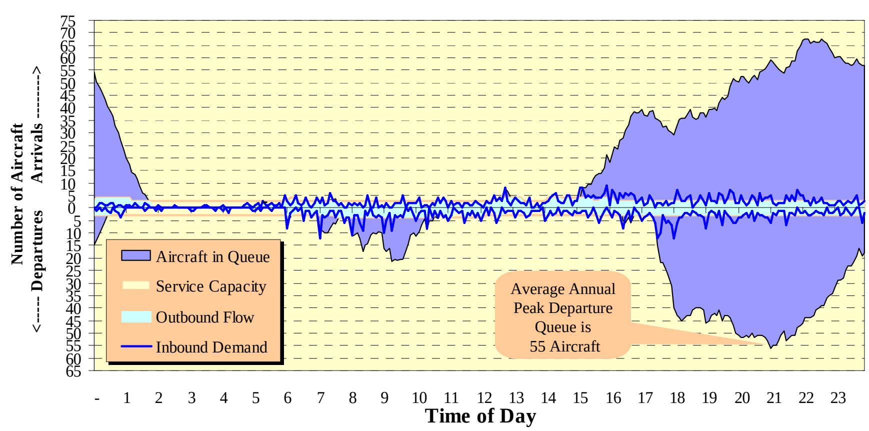
	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	34	36	47	36	34	44
5 Minute	2.8	3.0	3.9	3.0	2.8	3.7
20 Minute	11.3	12.0	15.7	12.0	11.3	14.7



2015 JFK Queuing Analysis

Average Annual Capacity →

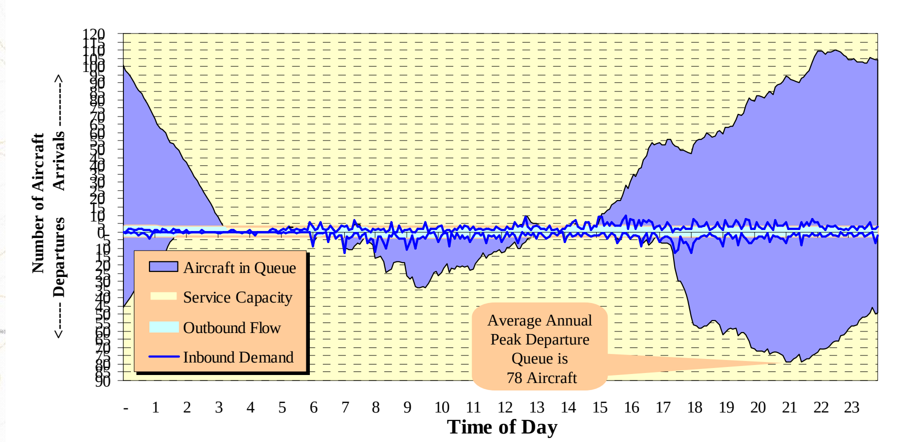
	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	34	36	47	36	34	44
5 Minute	2.8	3.0	3.9	3.0	2.8	3.7
20 Minute	11.3	12.0	15.7	12.0	11.3	14.7



2025 JFK Queuing Analysis

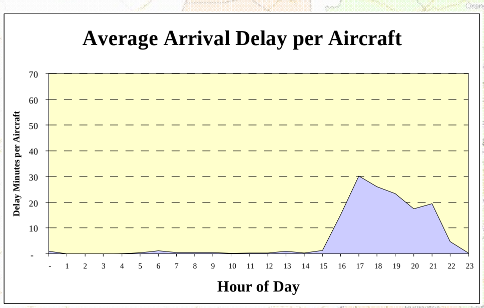
Average Annual Capacity →

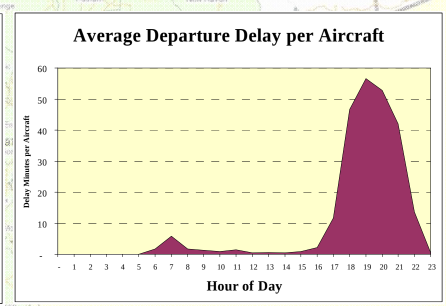
	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	34	36	47	36	34	44
5 Minute	2.8	3.0	3.9	3.0	2.8	3.7
20 Minute	11.3	12.0	15.7	12.0	11.3	14.7



2004 JFK Runway Delays

Average Annual Arrival Delay = 9.0 (ASPM = 10.5)
Average Annual Departure Delay = 15.9 (ASPM = 15.9)





Number of Delayed Aircraft

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
290	58	13	22	64	53	34	15
52.8%	10.5%	2.3%	4.0%	11.7%	9.7%	6.2%	2.7%

Number of Delayed Aircraft

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
255	86	18	16	10	11	10	141
46.4%	15.7%	3.4%	3.0%	1.9%	2.1%	1.8%	25.7%

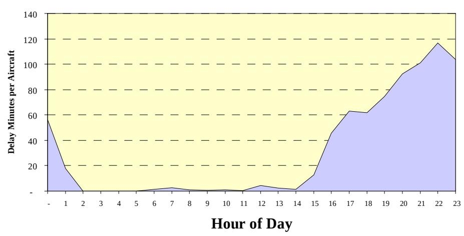
30% of arrivals delayed more than 15 Min.

31% of departures delayed more than 15 Min.

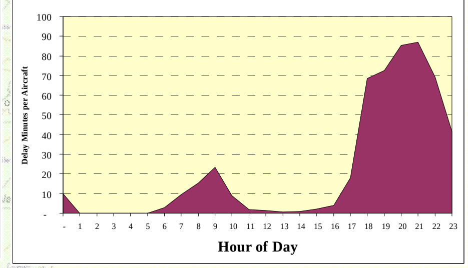
2015 JFK Runway Delays

	2004	2015
Average Annual Arrival Delay	= 9.0 (ASPM = 10.5)	40.9 Min./Aircraft
Average Annual Departure Delay	= 15.9 (ASPM = 15.9)	29.3 Min./Aircraft

Average Arrival Delay per Aircraft



Average Departure Delay per Aircraft



Number of Delayed Aircraft (Arrivals)

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
190	72	27	8	17	22	8	308
29.1%	11.1%	4.2%	1.3%	2.6%	3.4%	1.2%	47.2%

Number of Delayed Aircraft (Departures)

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
155	105	46	55	24	27	20	221
23.8%	16.1%	7.1%	8.5%	3.7%	4.1%	3.1%	34.0%

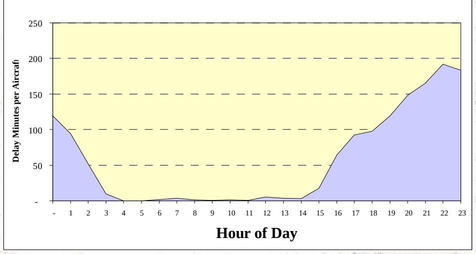
55% of arrivals delayed more than 15 Min.

45% of departures delayed more than 15 Min.

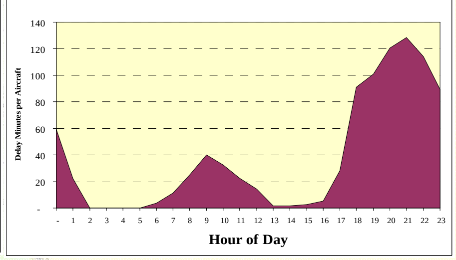
2025 JFK Runway Delays

	Arrival Delays			Departure Delays		
	2004	2015	2025	2004	2015	2025
Average	9.0	40.9	67.0	15.9	29.3	46.3
Peak Hour	30.3	116.9	191.8	56.6	87.1	128.5

Average Arrival Delay per Aircraft



Average Departure Delay per Aircraft



Number of Delayed Aircraft (Arrivals)

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
178	87	29	17	7	8	12	388
24.5%	12.0%	3.9%	2.4%	0.9%	1.1%	1.6%	53.5%

Number of Delayed Aircraft (Departures)

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
100	53	61	49	44	37	39	343
13.9%	7.3%	8.4%	6.8%	6.0%	5.1%	5.4%	47.5%

57% of arrivals delayed more than 15 Min.

64% of departures delayed more than 15 Min.

JFK Runway Capacity Needs

- To maintain existing levels of service
  - Increase Runway Capacity by approximately 10%
    - 60 arrivals or 60 departures peak one-way flow
    - 40 arrivals/40 departures per hour (all-weather average) from two parallel runways (or equivalent), or
  - Departure queue management plan for 50+ aircraft

EWR AIRFIELD ANALYSIS

- Forecast Demand
- Runway Use
- Queuing Needs
- Delay Analyses
- Future Runway Capacity Needs

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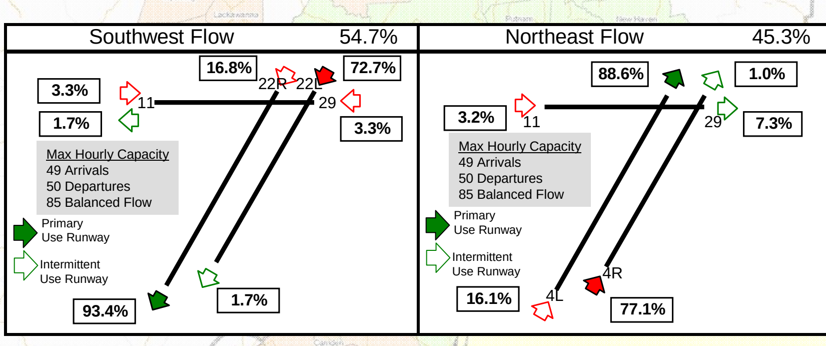
EWR Runway Configurations



EWR Airport ASPM Data

95th Percentile Capacity Values by Configuration

EWR - Weighted Average Capacity Calculations

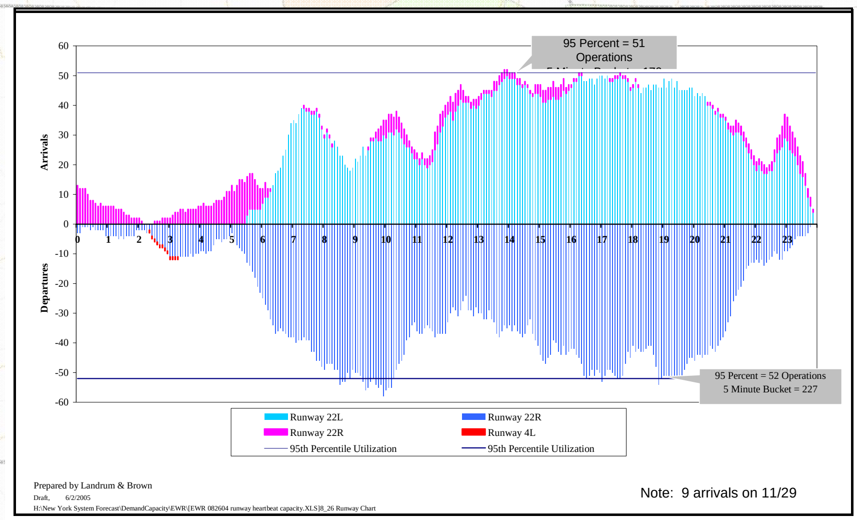
Configuration	Percentage of Operations	Adjusted Percentage	Arrival Push ARR	Arrival Push DEP	Total	Departure Push ARR	Departure Push DEP	Total	Mixed Operations ARR	Mixed Operations DEP	Total	
22L | 22R	45%	46%	49	40	89	36	51	87	45	48	93	
4R | 4L	38%	39%	49	40	89	40	50	90	45	43	88	
22R | 22R	8%	8%	44	40	84	40	47	87	42	45	87	Doubtful Accuracy
4L | 4L	3%	3%	43	35	78	30	50	80	41	42	83	Doubtful Accuracy
4L | 11	3%	3%	41	35	76	33	44	77	39	39	78	
	97%	100%	48.2	39.7	87.8	37.6	50.0	87.6	44.4	45.3	89.8	

Based on 2004 ASPM

- CATER data confirmed ASPM capacity values for dual runway 4L/4R and 22R/22L operations
- CATER data confirmed that single runway 4L/22R operations are predominantly at night and off-peak hours – additional capacity estimates not necessary
- ASPM capacity data calibrate sufficiently to CATER to confirm their usability

Example CATER Analysis

EWR Runway Use for Southwest Flow



Newark Liberty International Airport South Flow	Actual Operations (Aug. 26, 2004) Rolling 60-Minute Operations Rate in 5 Minute Intervals	EXHIBIT 1

EWR ASPM Summary

AAR/ADR Calculator : Summary (Hourly Source)

From 2004 To 2004 : 'EWR' : Calendar Year

		Conditions To Vector For Visual Approach	
Airport Efficiency Traffic Count :	437937		
OPSNET Operations :	440437	Ceiling :	3000
Percent Of Operations :	99	Visibility :	4

Actual Efficiency Counts

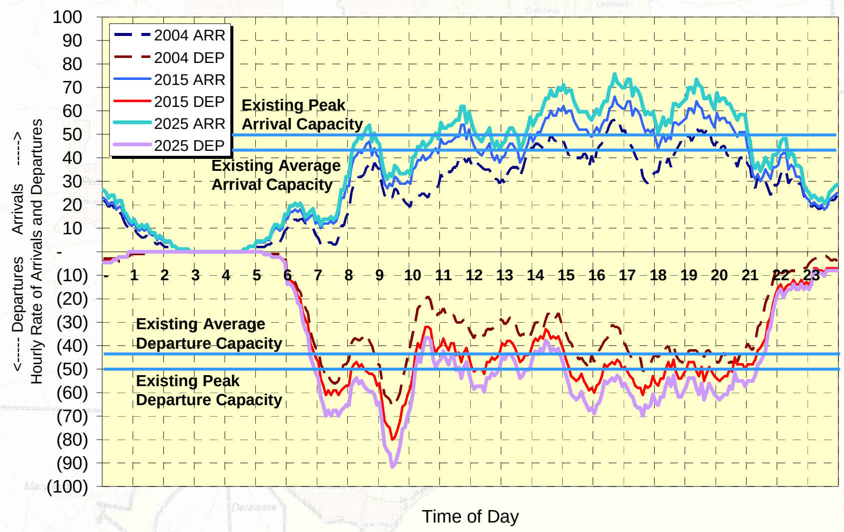
	Time Periods	Max	99th	95th	75th	Min	Median	Average
Departure	5490	66	57	50	43	0	36	35
Arrival	5490	58	52	48	41	0	35	33
Total Operations	5490	104	95	89	79	1	71	68

Facility Provided Rates

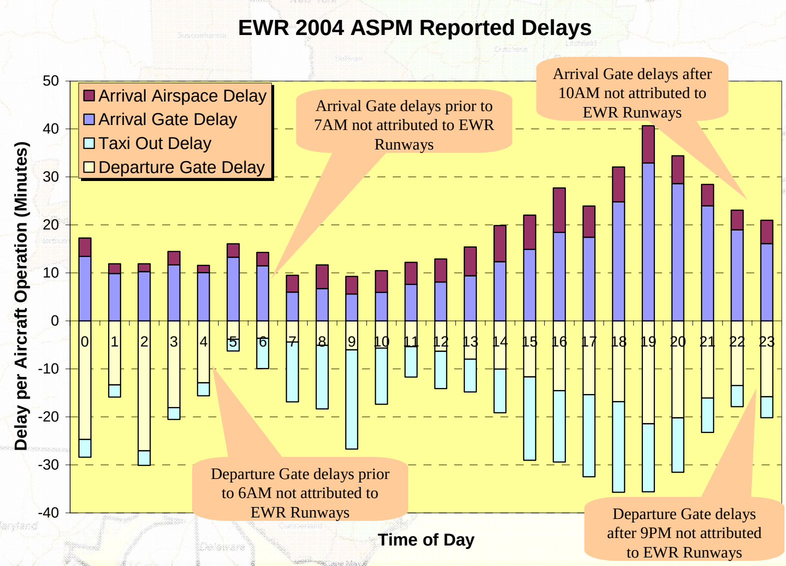
	Time Periods	Max	99th	95th	75th	Min	Median	Average
ADR	5490	60	54	50	44	4	44	42
AAR	5490	72	55	50	45	20	44	42
Total (ADR+AAR)	5490	132	108	100	90	35	88	85

EWR Forecast of Future Demand

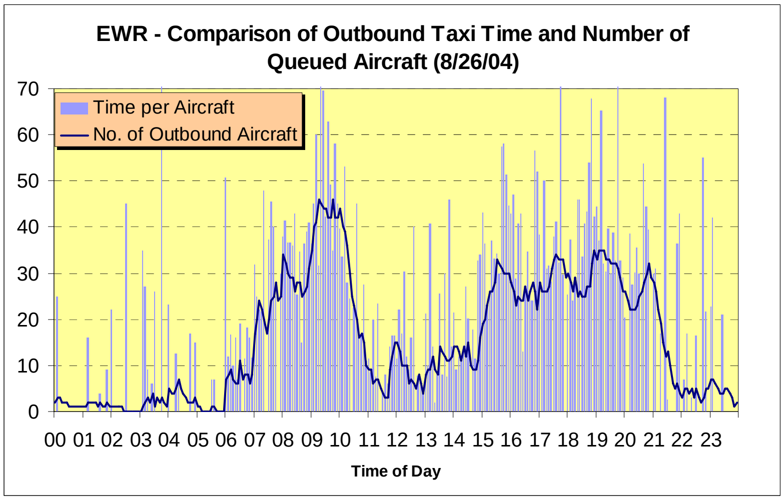
Hourly Rate of Arrivals and Departures



EWR Runway Delays



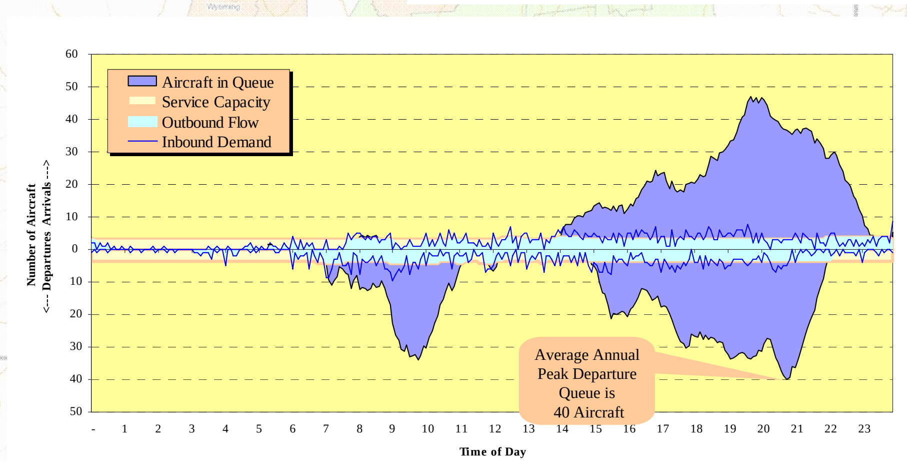
EWR Taxiway Use



2004 EWR Queuing Analysis

Average Annual Capacity →

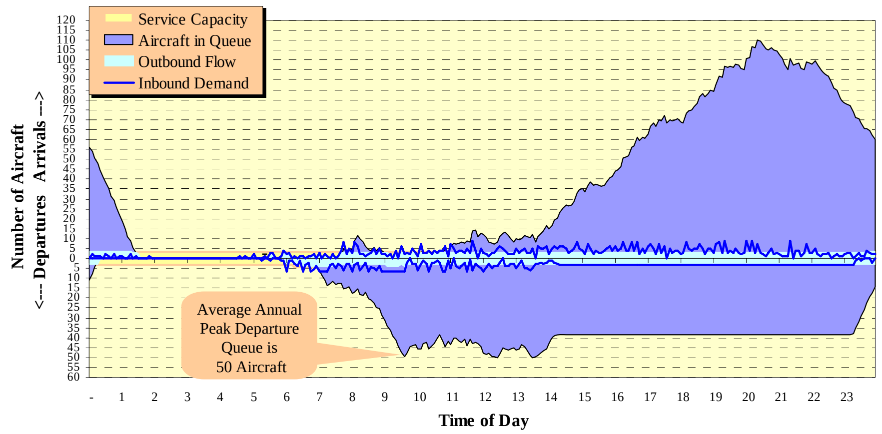
	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	42	43	49	40	38	50
5 Minute	3.5	3.5	4.1	3.3	3.2	4.2
20 Minute	14.0	14.2	16.3	13.3	12.7	16.7



2015 EWR Queuing Analysis

Average Annual Capacity →

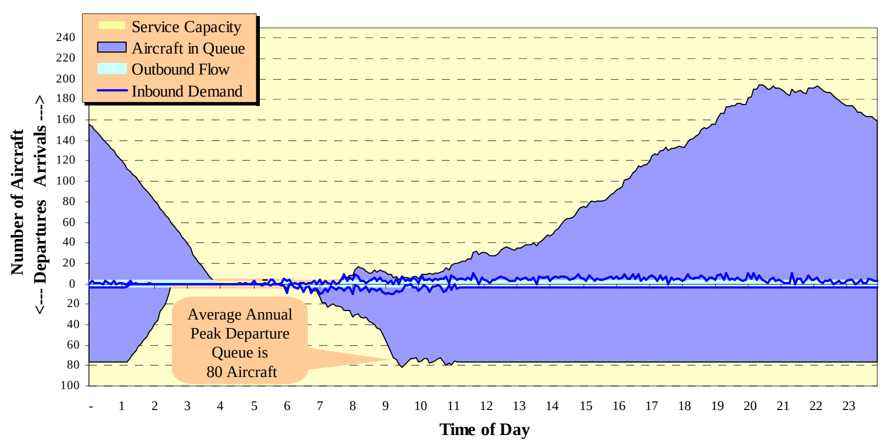
	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	42	43	49	40	38	50
5 Minute	3.5	3.5	4.1	3.3	3.2	4.2
20 Minute	14.0	14.2	16.3	13.3	12.7	16.7



2025 EWR Queuing Analysis

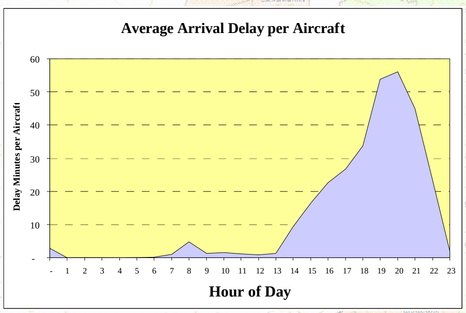
Average Annual Capacity →

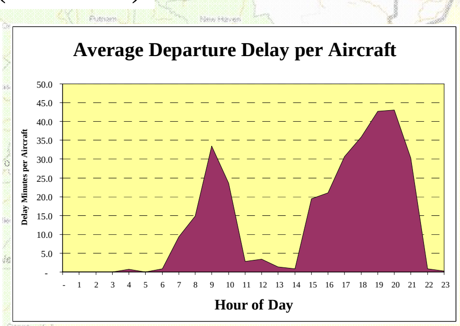
	Balanced Capacity		Arrival Preference		Departure Preference	
	Arrival	Departure	Arrival	Departure	Arrival	Departure
Hourly	42	43	49	40	38	50
5 Minute	3.5	3.5	4.1	3.3	3.2	4.2
20 Minute	14.0	14.2	16.3	13.3	12.7	16.7



2004 EWR Runway Delays

Average Annual Arrival Delay = 18.5 (ASPM 18.9)
Average Annual Departure Delay = 19.4 (ASPM 20.1)





Number of Delayed Aircraft

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
208	99	39	56	36	44	59	154
29.9%	14.2%	5.7%	8.1%	5.2%	6.3%	8.4%	22.1%

Number of Delayed Aircraft

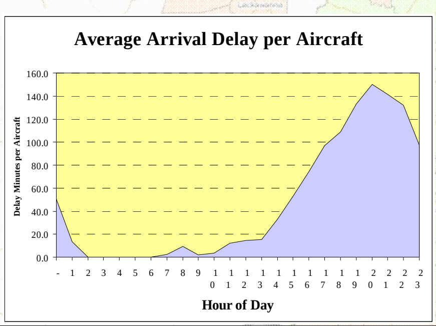
No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
166	69	51	68	53	53	39	206
23.6%	9.7%	7.3%	9.7%	7.5%	7.6%	5.6%	29.2%

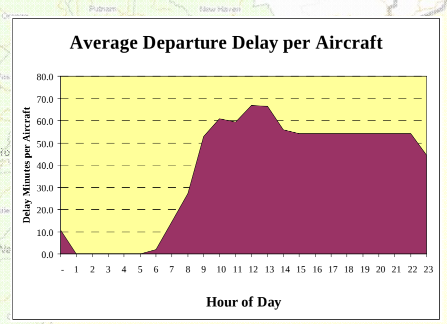
42% of arrivals delayed more than 15 Min.

50% of departures delayed more than 15 Min.

2015 EWR Runway Delays

	2004	2015
Average Annual Arrival Delay	= 18.5 (ASPM 18.9)	61.1 Min./Aircraft
Average Annual Departure Delay	= 19.4 (ASPM 20.1)	48.1 Min./Aircraft





Number of Delayed Aircraft

No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
79	69	64	71	35	14	11	448
10.1%	8.7%	8.1%	9.0%	4.5%	1.8%	1.4%	57.0%

Number of Delayed Aircraft

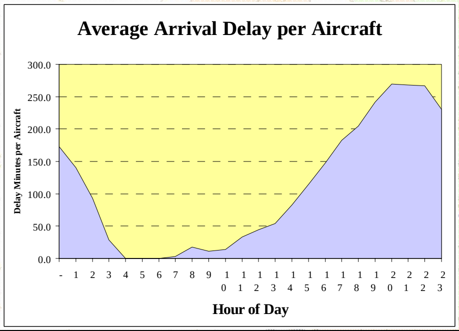
No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
31	24	12	21	23	24	14	641
3.9%	3.0%	1.5%	2.6%	3.0%	3.0%	1.7%	81.3%

64% of arrivals delayed more than 15 Min.

89% of departures delayed more than 15 Min.

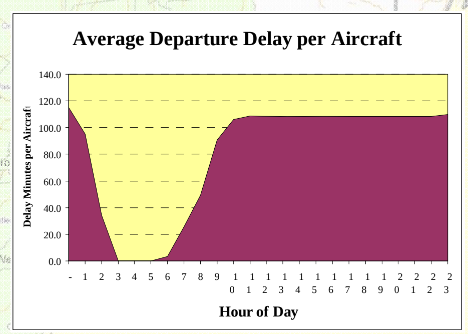
2025 EWR Runway Delays

	Arrival Delays			Departure Delays		
	2004	2015	2025	2004	2015	2025
Average	18.5	61.1	124.0	19.4	48.5	92.2
Peak Hour	56.1	150.1	269.8	43.1	67.2	115.2



Number of Delayed Aircraft							
No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
47	16	45	51	32	15	18	679
5.2%	1.8%	5.1%	5.7%	3.5%	1.7%	1.9%	75.5%

82% of arrivals delayed more than 15 Min.



Number of Delayed Aircraft							
No Delay	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min	> 30 min
31	24	12	21	23	24	14	641
3.9%	3.0%	1.5%	2.6%	3.0%	3.0%	1.7%	81.3%

90% of departures delayed more than 15 Min.

EWR Runway Capacity Needs

- To maintain existing levels of service
  - Increase Runway Capacity by approximately 15%
    - 60 arrivals or 60 departures peak one-way flow
    - 96 per hour (all-weather average) from parallel runways (or equivalent)
  - Departure queue management plan for 50 aircraft

ASPM Database Information

- Excerpt from FAA Presentation made at O'Hare International Airport
- December 2005

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ASPM Overview

ASQP	ASPM	OPSNET
Data from 19 carriers provided monthly for all domestic flights	Data available for all carriers at 75 airports	Count of operations provided for towers, centers and TRACONS
Actual out of the gate, off the runway, on the runway and in the gate time (OOOI) provided	On a next day basis, OOOI data provided for 9 carriers (6 ASQP carriers plus FedEx, UPS and Air Canada)	Delays over 15 consecutive minutes (clock starts when flight comes under FAA control) are provided
Causal information provided for flights arriving 15 minutes or more past schedule (available from June 2003)	ASPM imports ASQP data when it is available, usually 25 days after the end of the month	Delays are those that are attributable to the National Airspace System (NAS) and weather
Percent on-time based on flights scheduled (counts cancelled and diversions as delayed)	Percent on-time based on flights flown (cancelled flights and diversions not included)	Causes of delays are provided (weather, volume, equipment, runway, other)
		Trends should be the same as ASPM or ASQP but count of delays and percent of operations delayed are not comparable
		Count of delays are assigned to the facility where the cause occurred not where the delay occurred

ASPM: Data and Functionality (FY 2005)
December 2005

Federal Aviation Administration

2

ASPM Overview

What is it?

- Integrated database of air traffic operations, airline schedules, operations and delays, weather information, runway information, and related statistics.

What is it used for?

- Reporting and analysis of operating performance of the National Airspace System (NAS).

Major Benefits:

- Internet interface to allow for quick analysis of large amount of operational data.
- System provides the capability to download data to individual analysts' workstations for further study.

Features:

- Data are available from January 2000 to present for 55 airports. Data for additional 20 airports are available from October 2004 to present.
- Actual traffic and airport information is confidential and access is restricted by password.
- Data come from ARINC's Out-Off-On-In (OOOI), Enhanced Traffic Management System (ETMS), US Department of Transportation's Aviation's Airline Service Quality Survey (ASQP), weather data, airport arrival and departure rates (15-interval), airport runway configurations and cancellations.

ASPM: Data and Functionality (FY 2005)
December 2005

Federal Aviation Administration

3

ASPM Overview

- Arrival/departure rates and runway configuration data are available from January 1, 2000 to present. Delay information is available from January 1, 1998 to present. Data are Internet-accessible by 0700 each week day.
- OOOI data are available for American, Air Canada, Continental, Delta, FedEx, Northwest, United, United Parcel Service and US Airways on a next day basis from ARINC. AirTran, Alaska, America West, American Eagle, ATA, Atlantic Southeast, Comair, ExpressJet, Frontier, Hawaiian, Independence, JetBlue, Skywest, and Southwest provide OOOI data through DOT On-Time system.

Usage

- On average, ASPM and the other modules are hit 19,000 times a day (+/- 500), which represents 7 hits per minute.

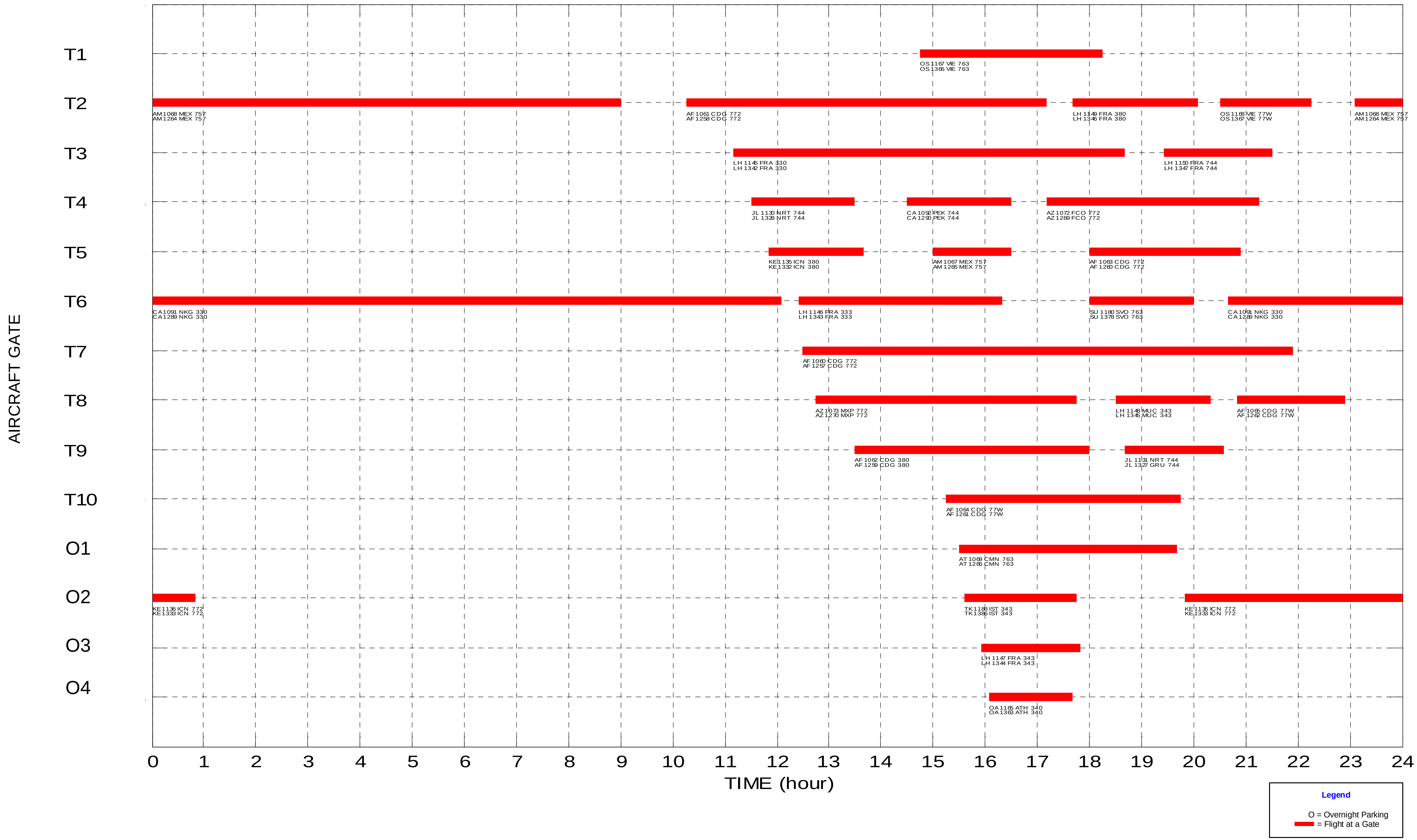
Note: All hours are local.

ASPM: Data and Functionality (FY 2005)
December 2005

Federal Aviation Administration

4

APPENDIX B
Gate Utilization 2004 & 2015



John F. Kennedy International Airport

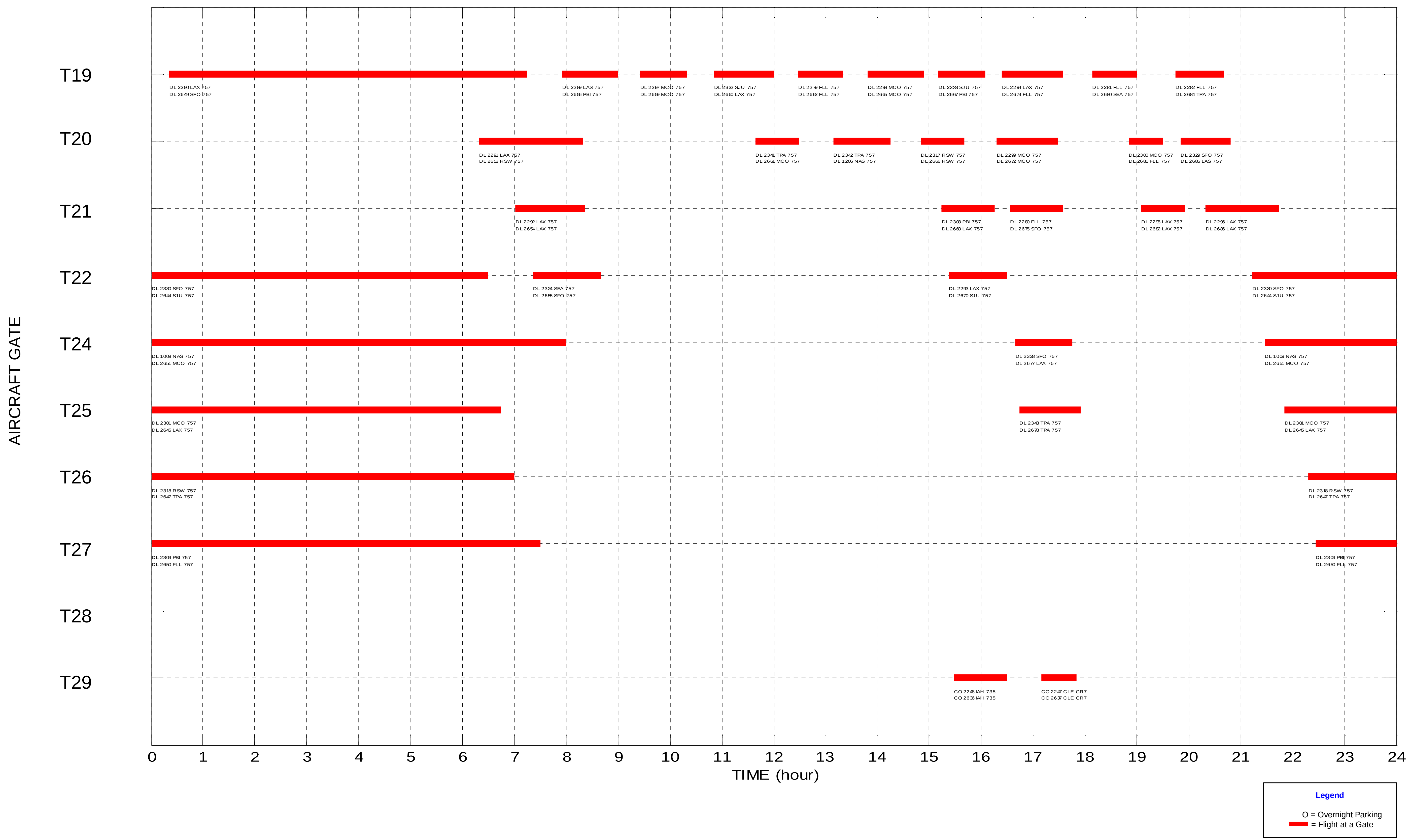
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T1- IN 2015

EXHIBIT 1

PB AVIATION

XX



John F. Kennedy International Airport

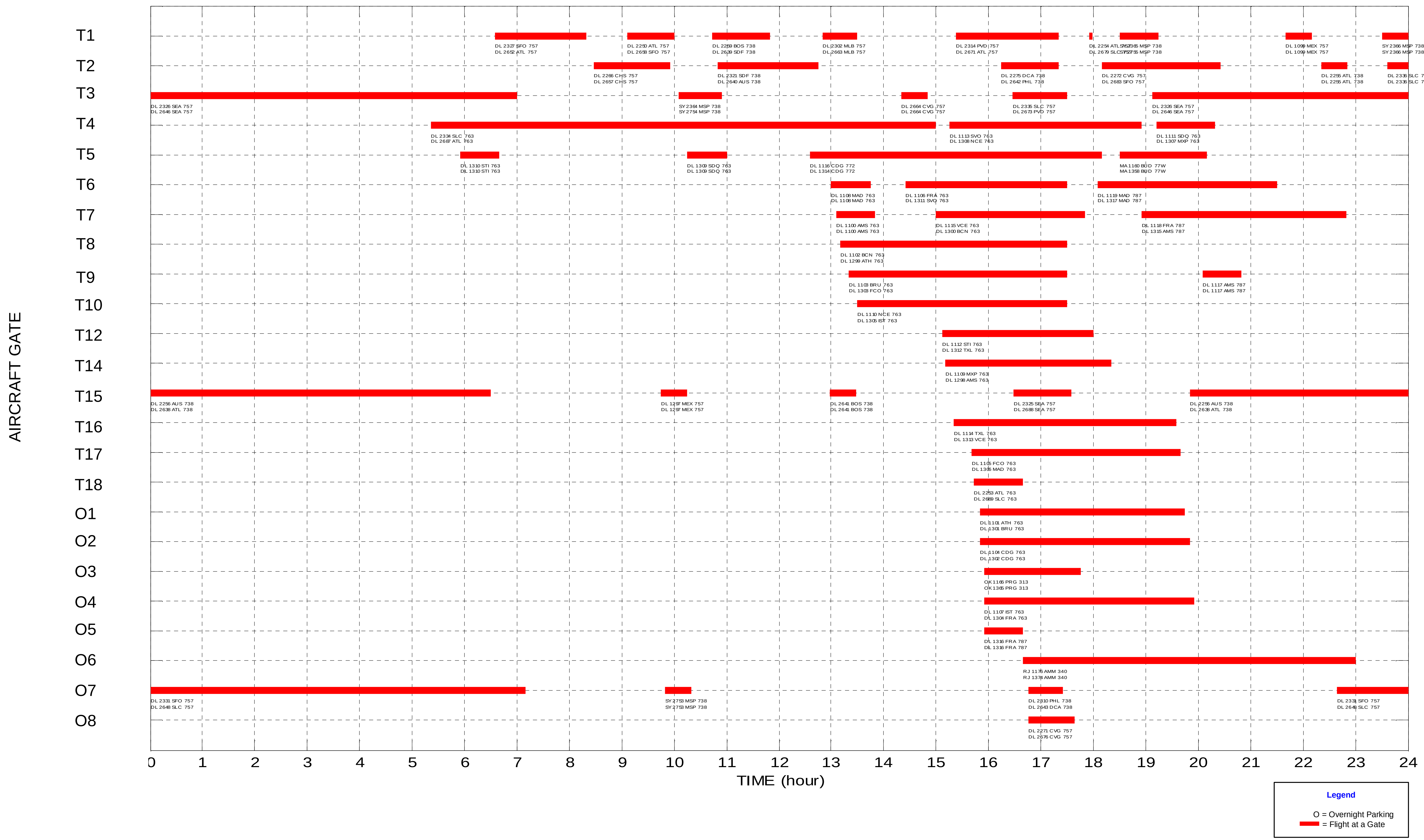
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T2- IN 2015

EXHIBIT 2

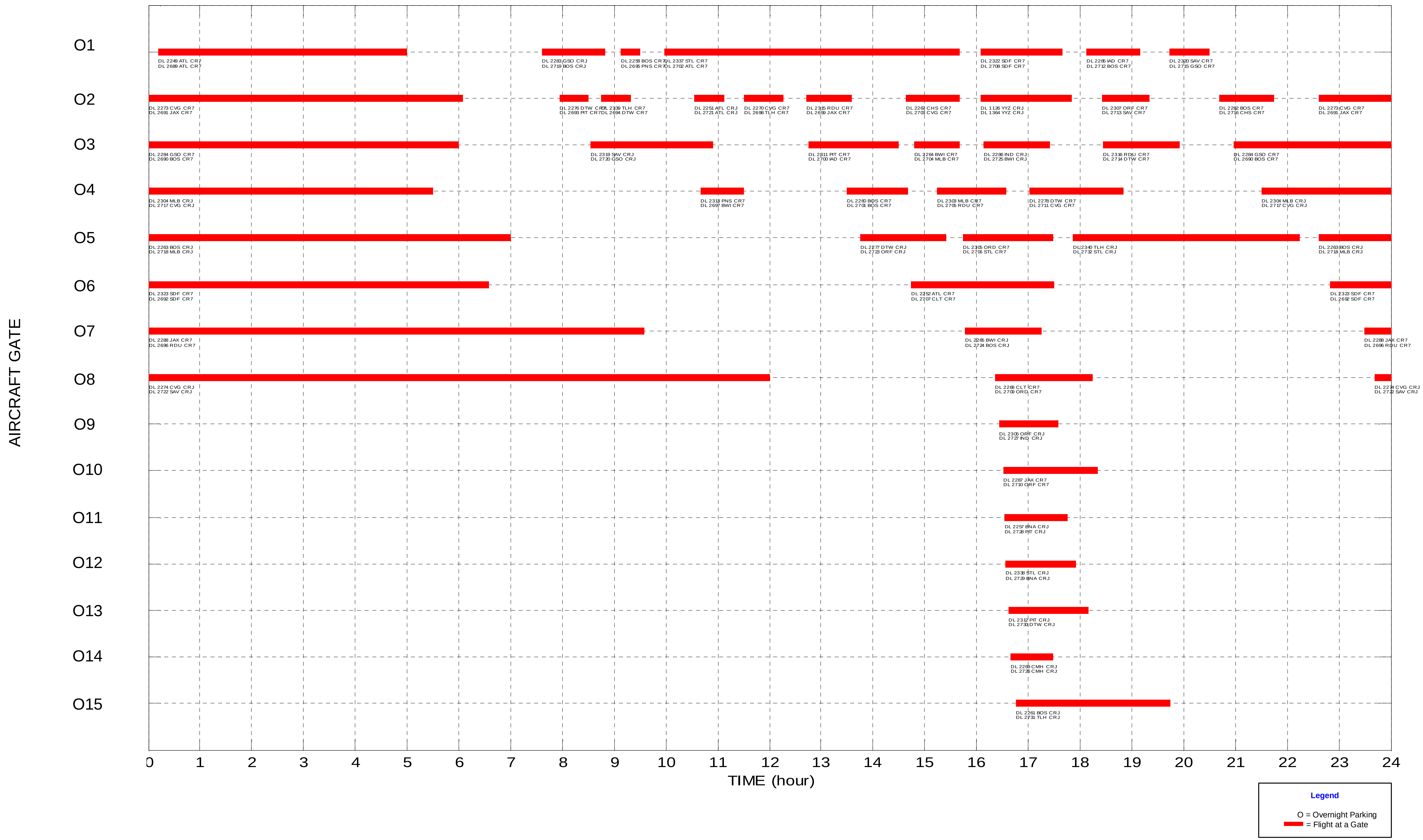
PB AVIATION

XX



John F. Kennedy International Airport FAA REGIONAL AIR SERVICE DEMAND STUDY	**AIRCRAFT RAMP CHART AT TERMINAL T3- IN 2015**	**EXHIBIT** **3**

PB AVIATION



John F. Kennedy International Airport

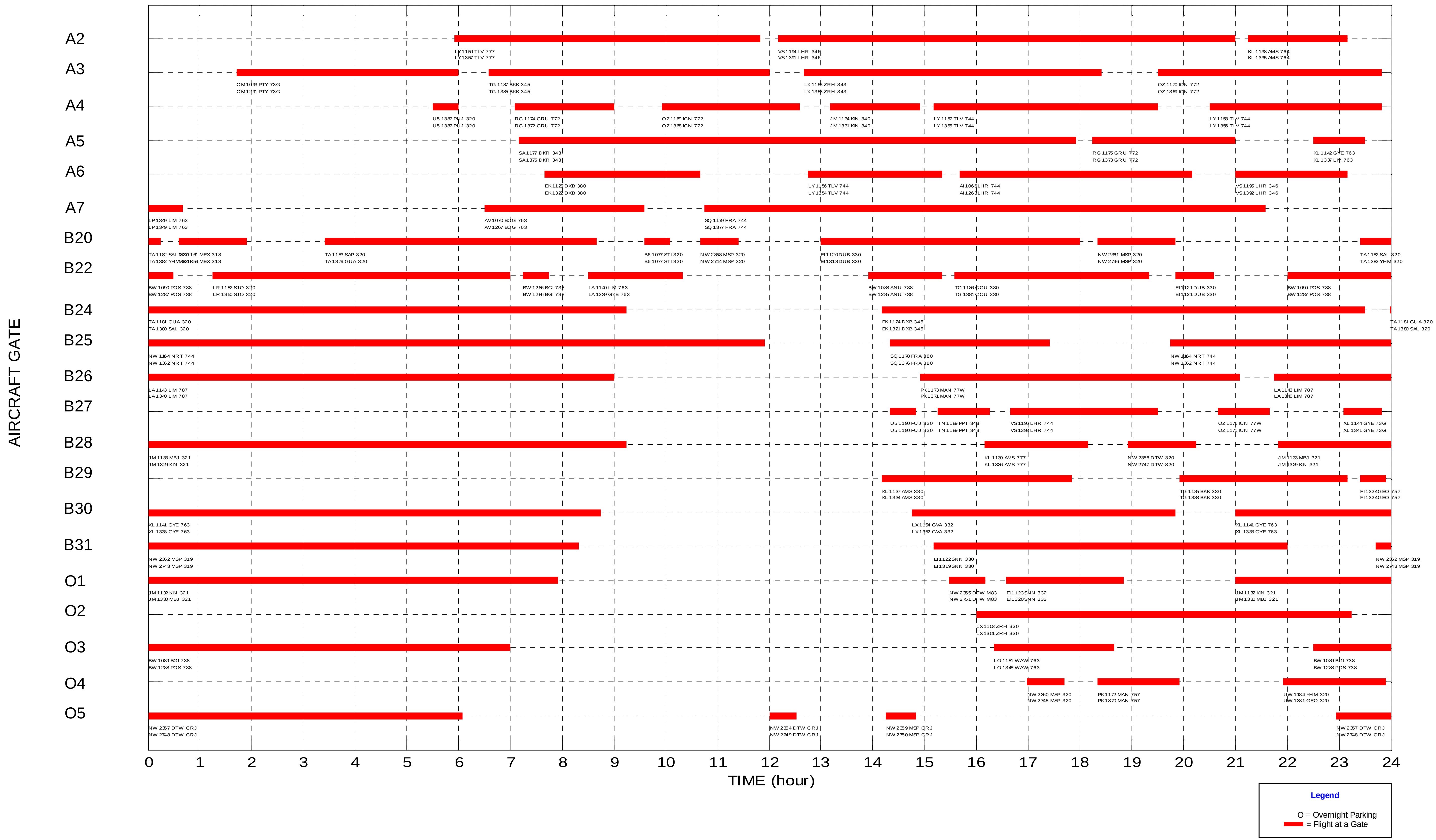
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T3 (RJ)- IN 2015

EXHIBIT 3

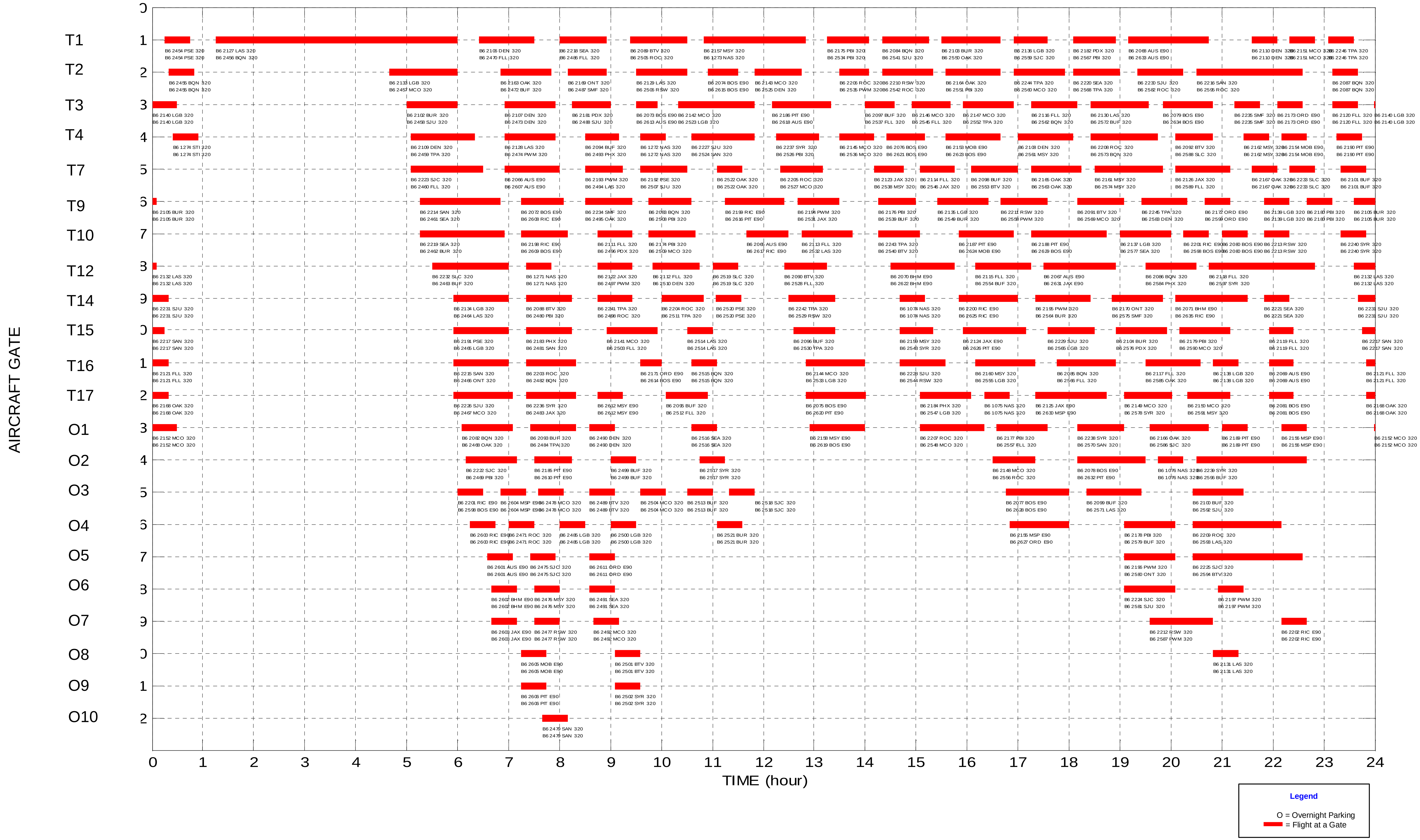
PB AVIATION

XX



John F. Kennedy International Airport FAA REGIONAL AIR SERVICE DEMAND STUDY	**AIRCRAFT RAMP CHART AT TERMINAL T4- IN 2015**	**EXHIBIT 4**

PB AVIATION



John F. Kennedy International Airport

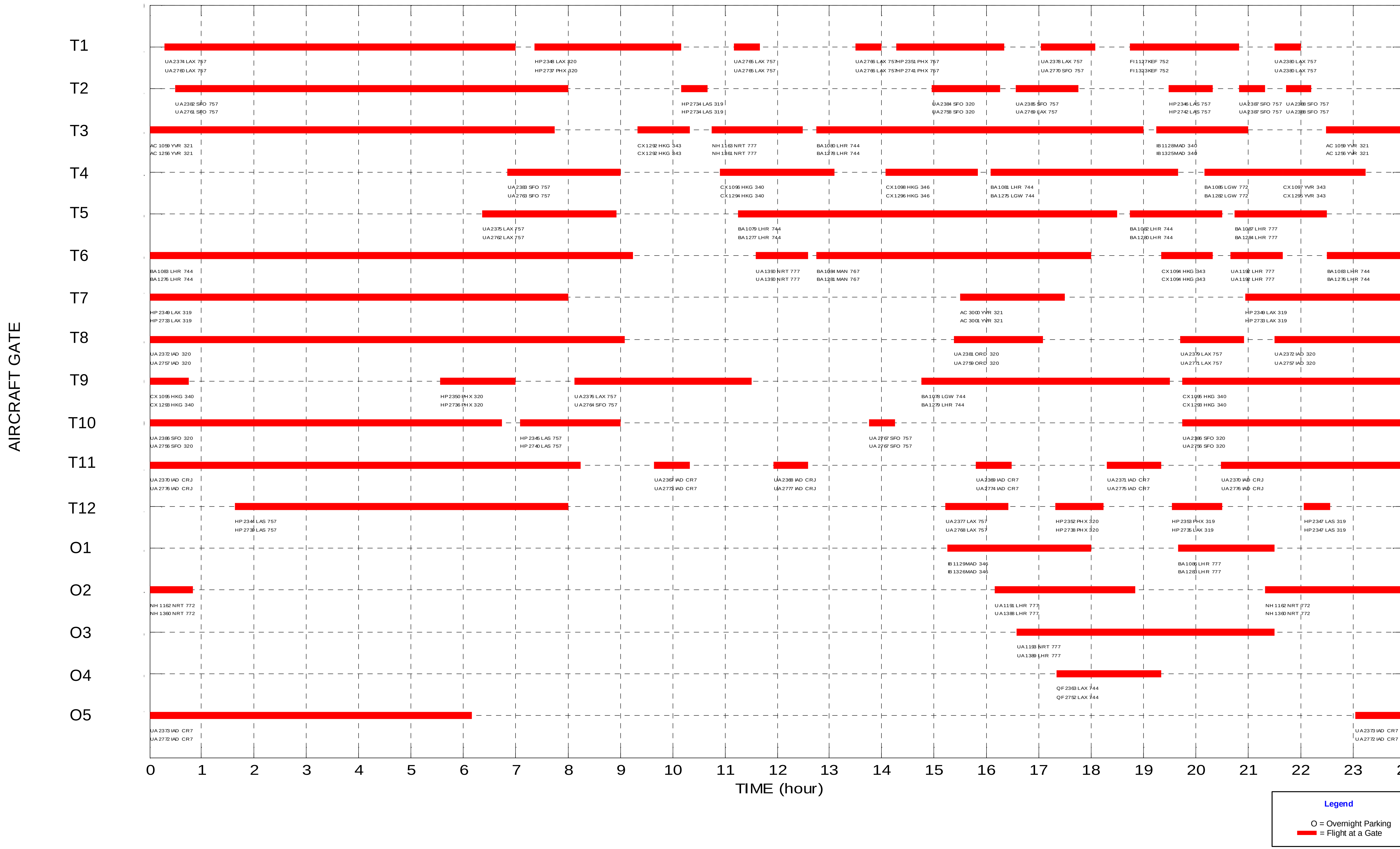
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T6- IN 2015

EXHIBIT 5

PB AVIATION

XX

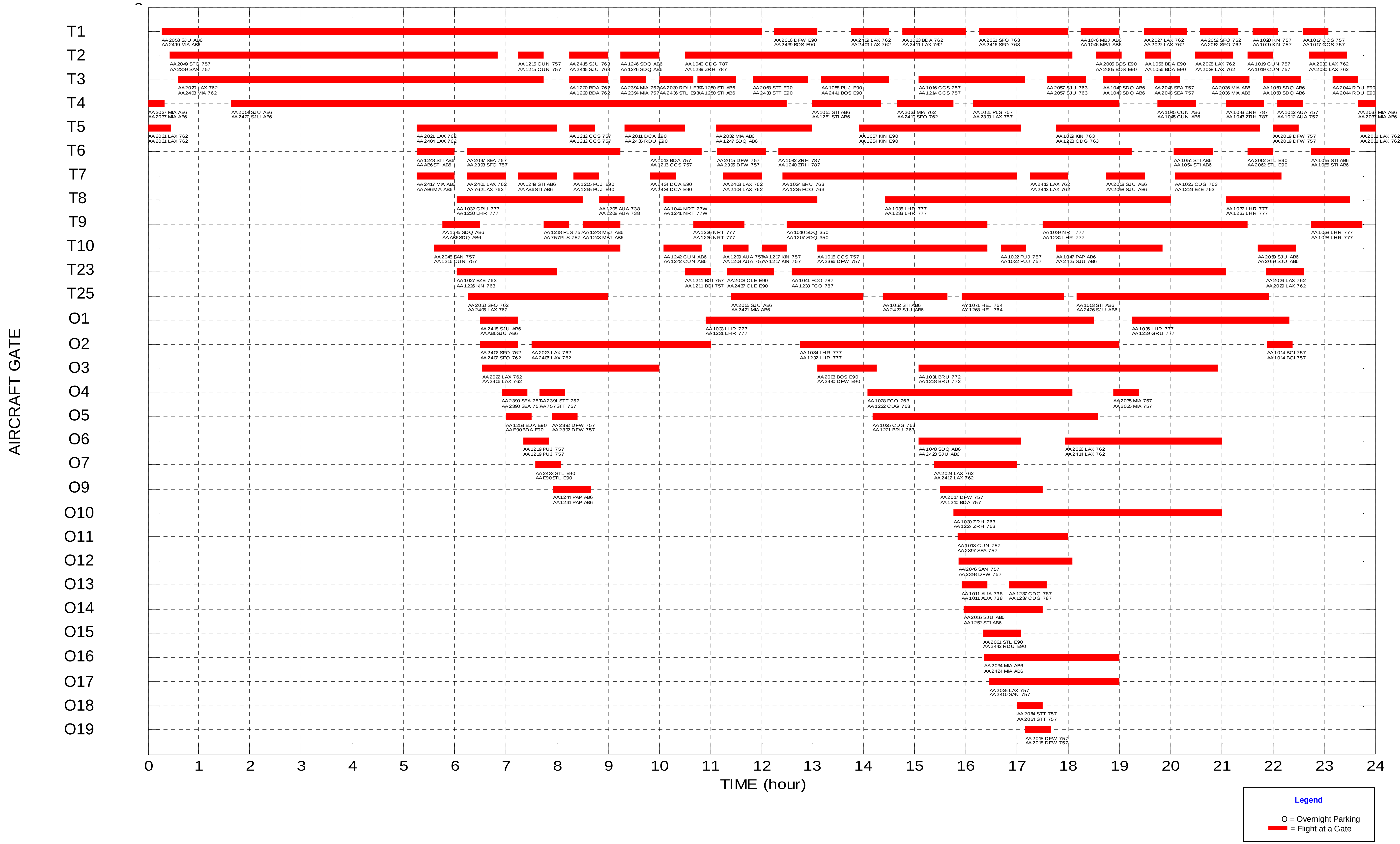


John F. Kennedy International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T7- IN 2015

EXHIBIT 6



John F. Kennedy International Airport

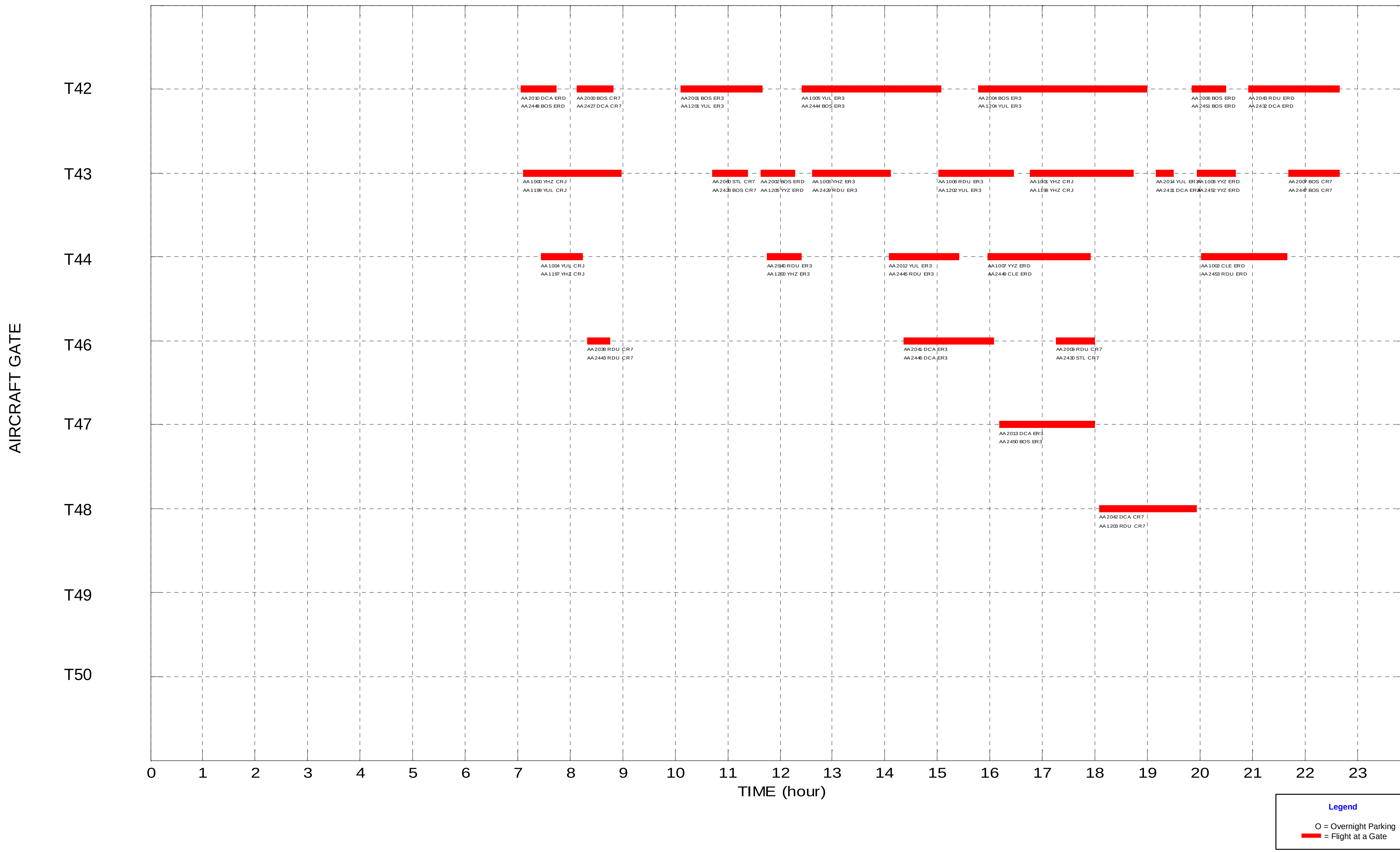
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T8- IN 2015

EXHIBIT 7

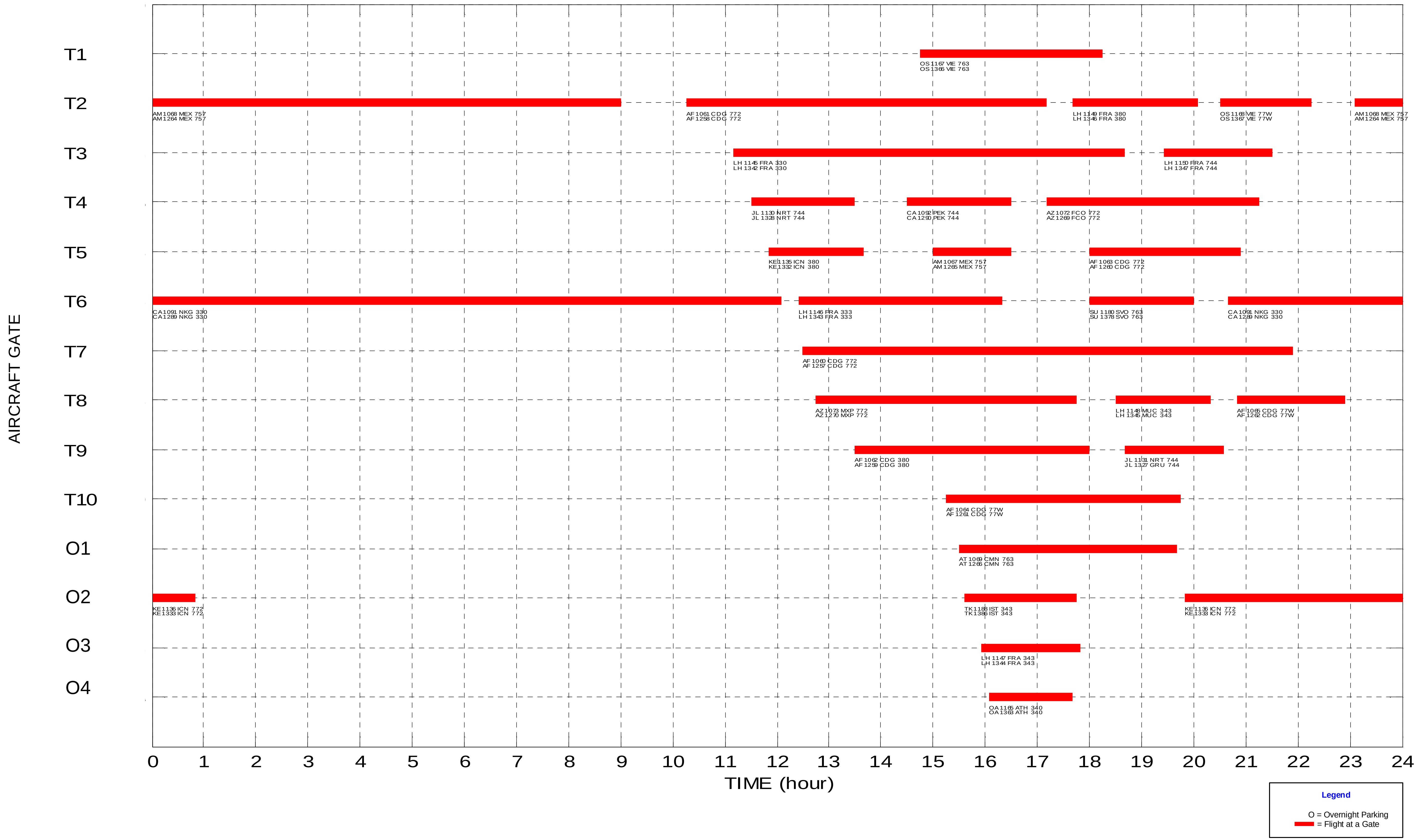
PB AVIATION

XX



John F. Kennedy International Airport FAA REGIONAL AIR SERVICE DEMAND STUDY	AIRCRAFT RAMP CHART AT TERMINAL T9- IN 2015	EXHIBIT 8

PB AVIATION



John F. Kennedy International Airport

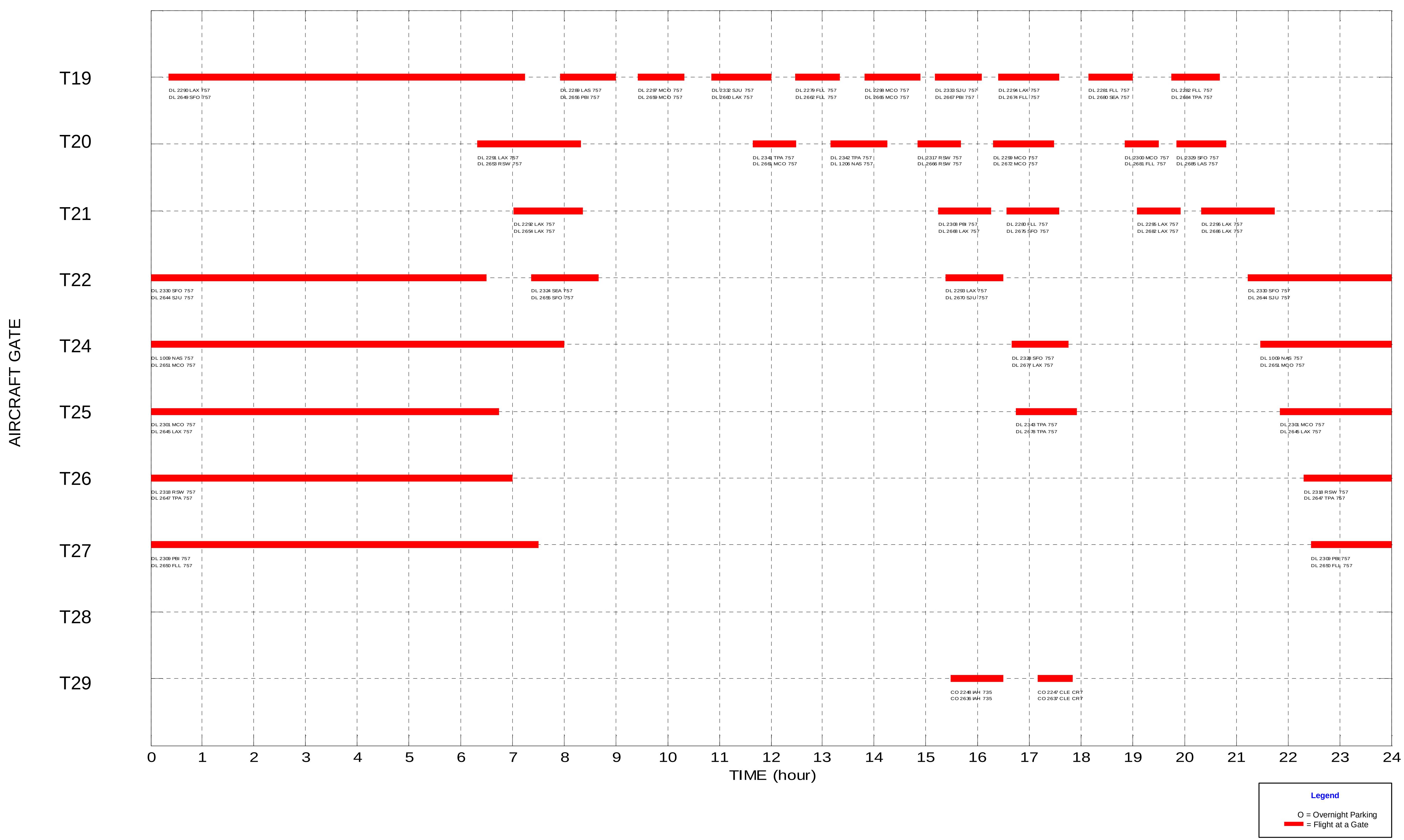
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T1- IN 2015

EXHIBIT 1

PB AVIATION

XX



John F. Kennedy International Airport

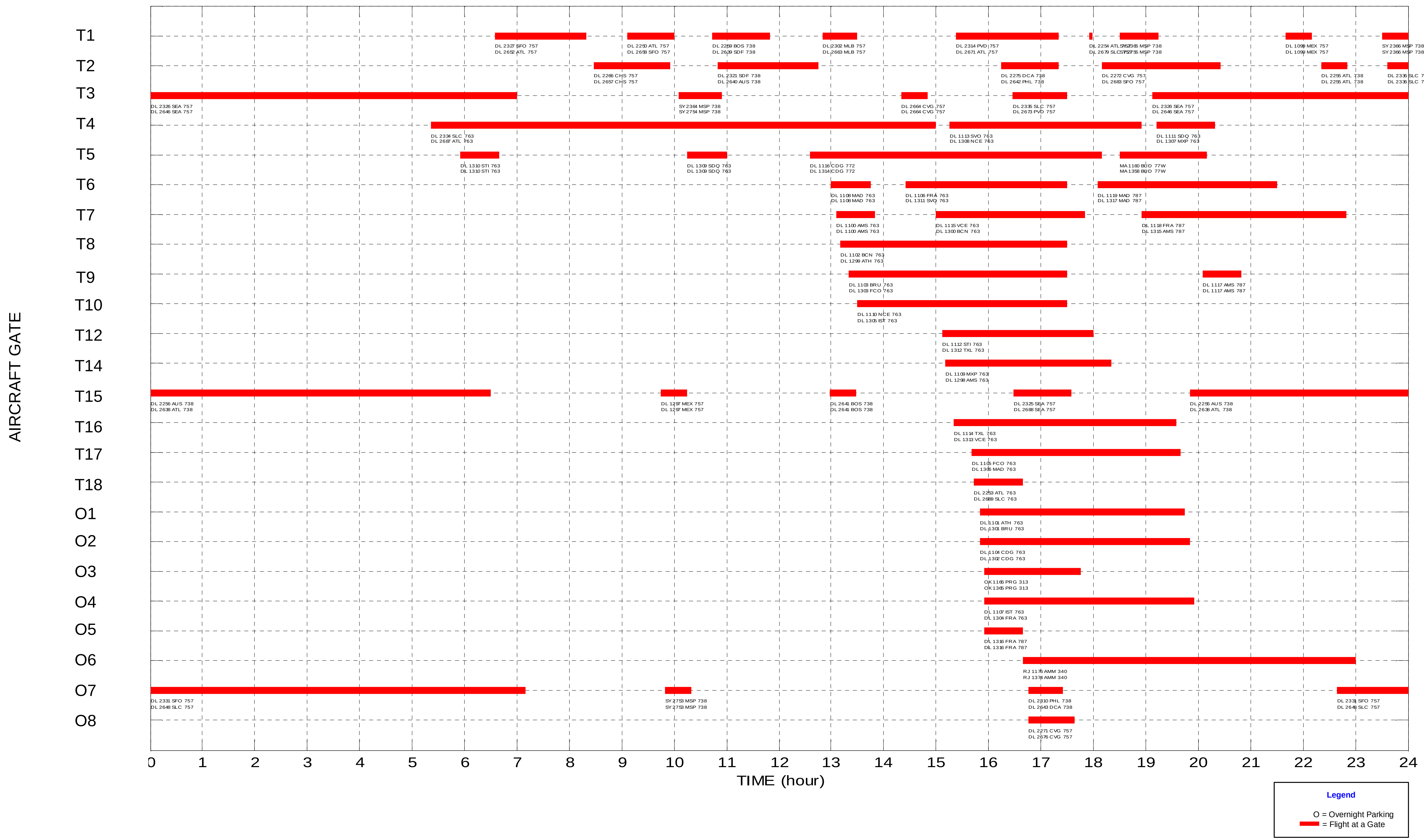
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T2- IN 2015

EXHIBIT 2

PB AVIATION

XX



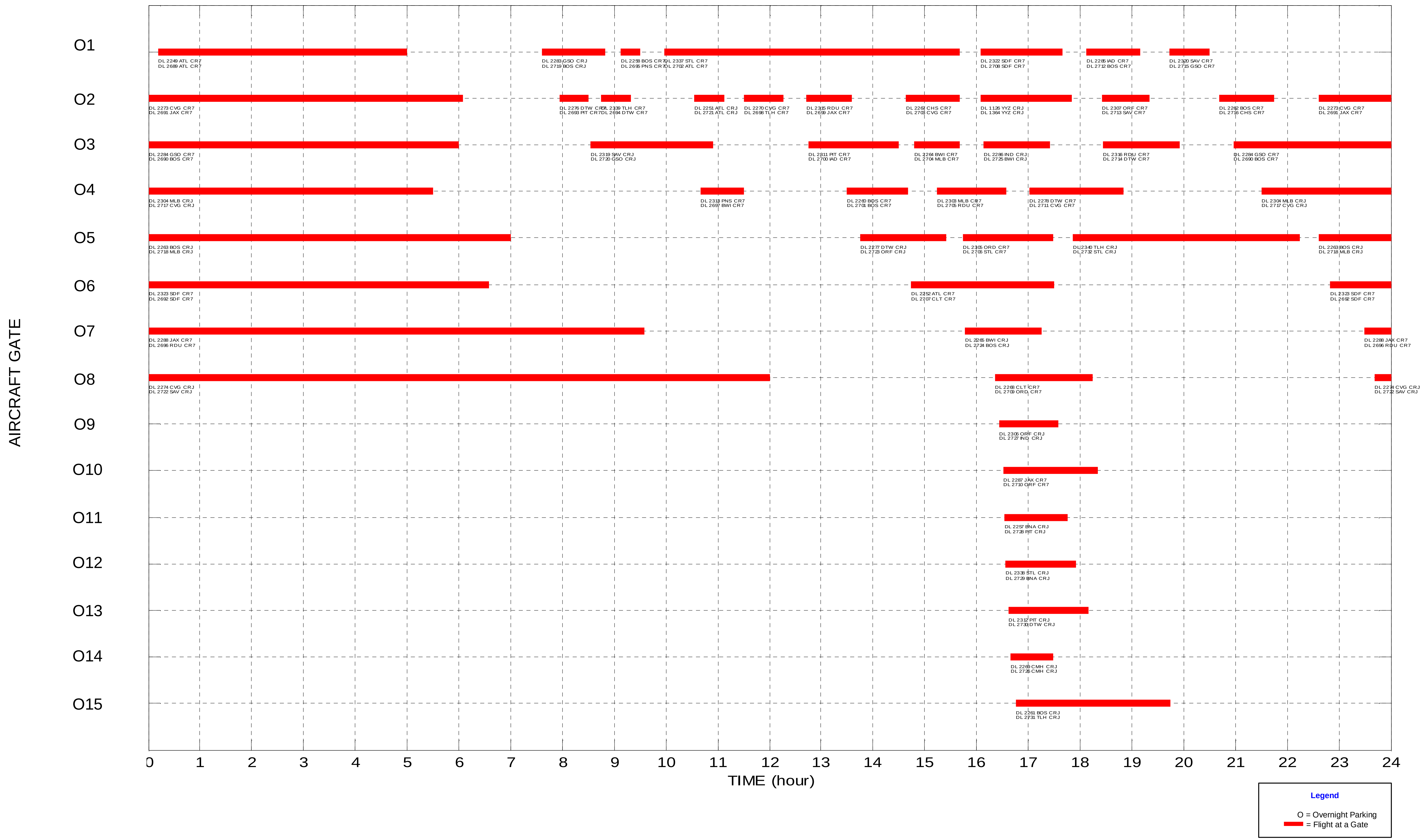
John F. Kennedy International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T3-IN 2015

EXHIBIT 3

PB AVIATION



John F. Kennedy International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

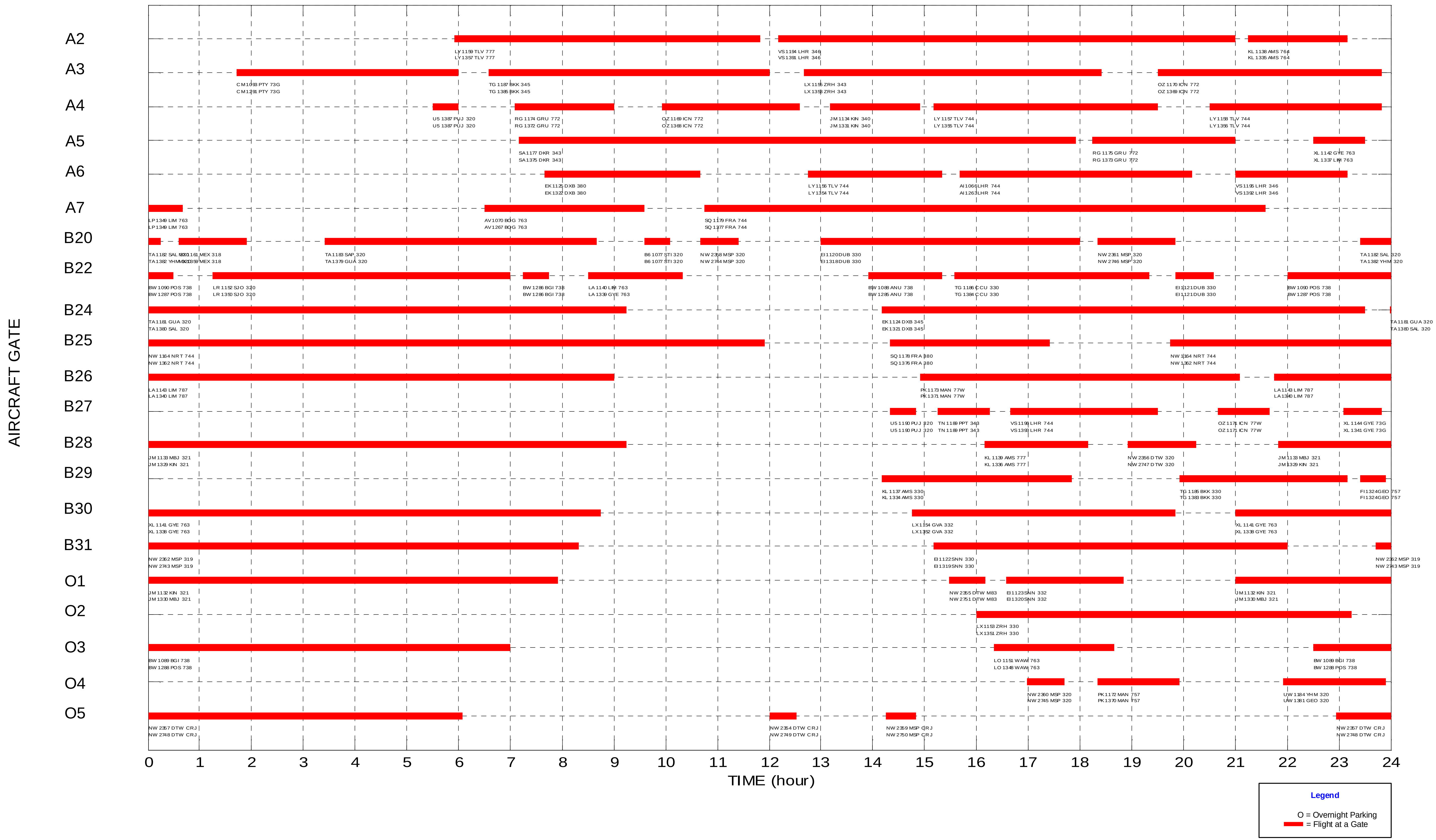
AIRCRAFT RAMP CHART AT TERMINAL T3 (RJ)- IN 2015

EXHIBIT

3

XX

PB AVIATION



John F. Kennedy International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T4- IN 2015

EXHIBIT 4

PB AVIATION

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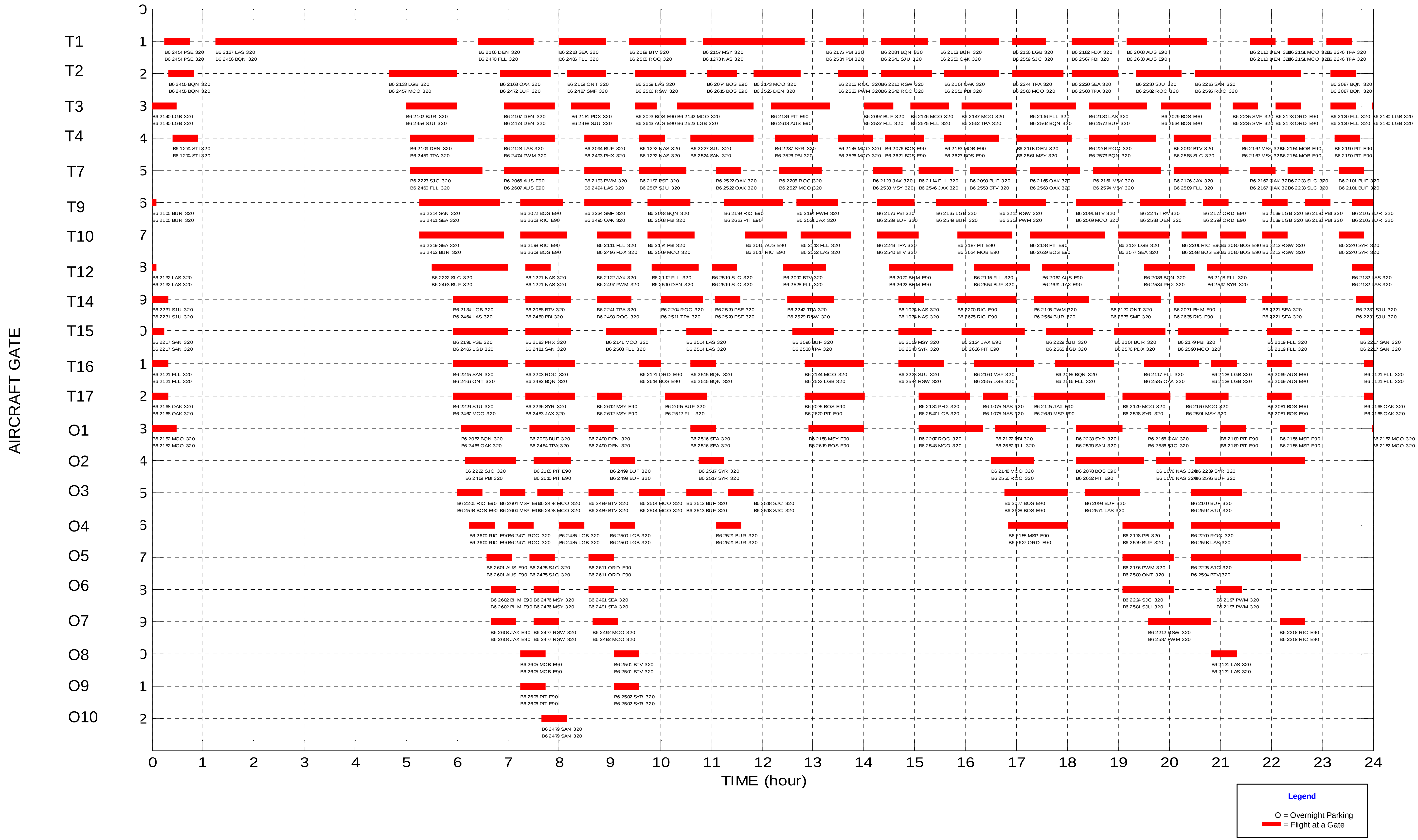

John F. Kennedy International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T6- IN 2015

EXHIBIT 5

PB AVIATION

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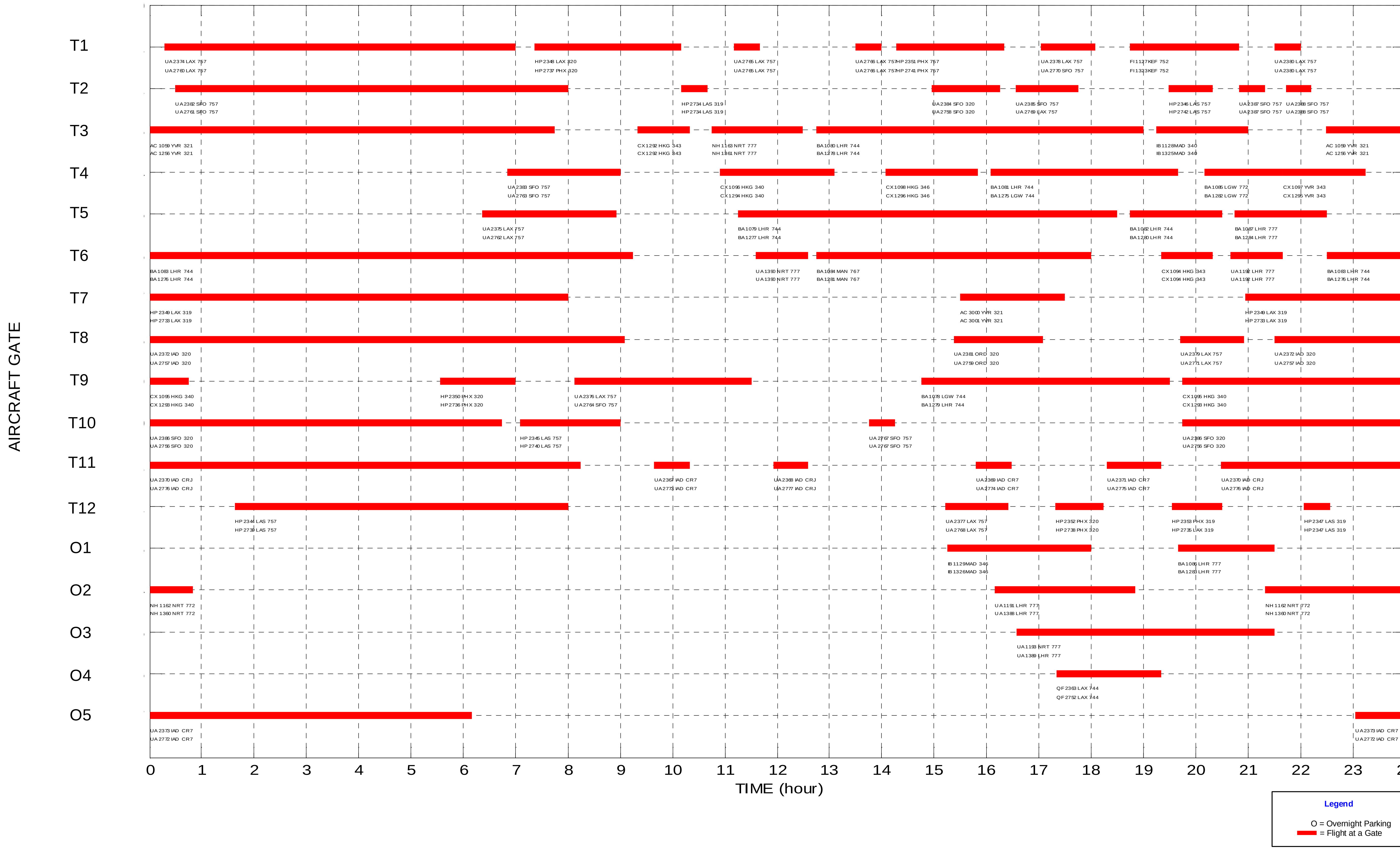


John F. Kennedy International Airport

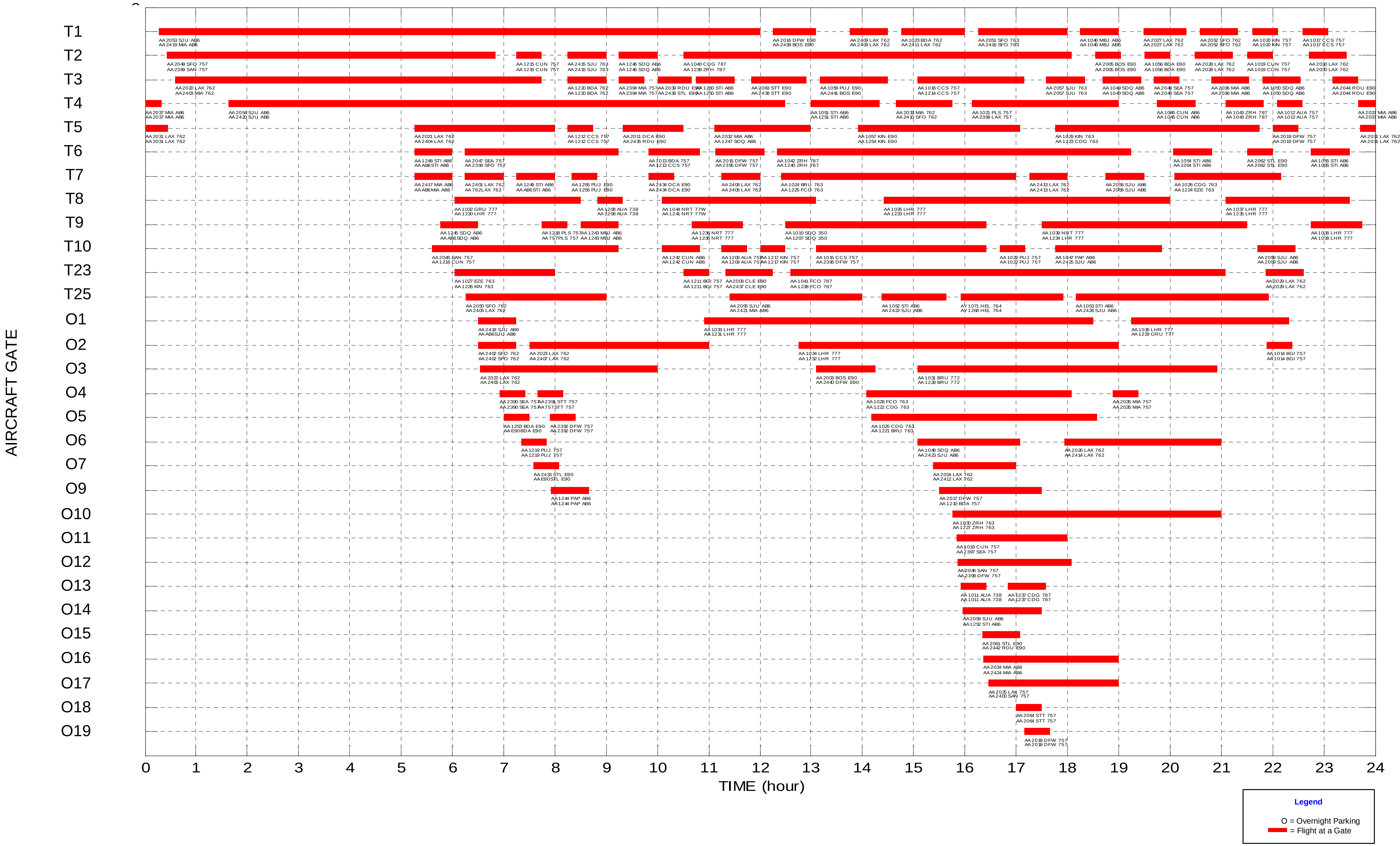
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T7- IN 2015

EXHIBIT 6

PB AVIATION

XX



John F. Kennedy International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T8- IN 2015

EXHIBIT 7

PB AVIATION

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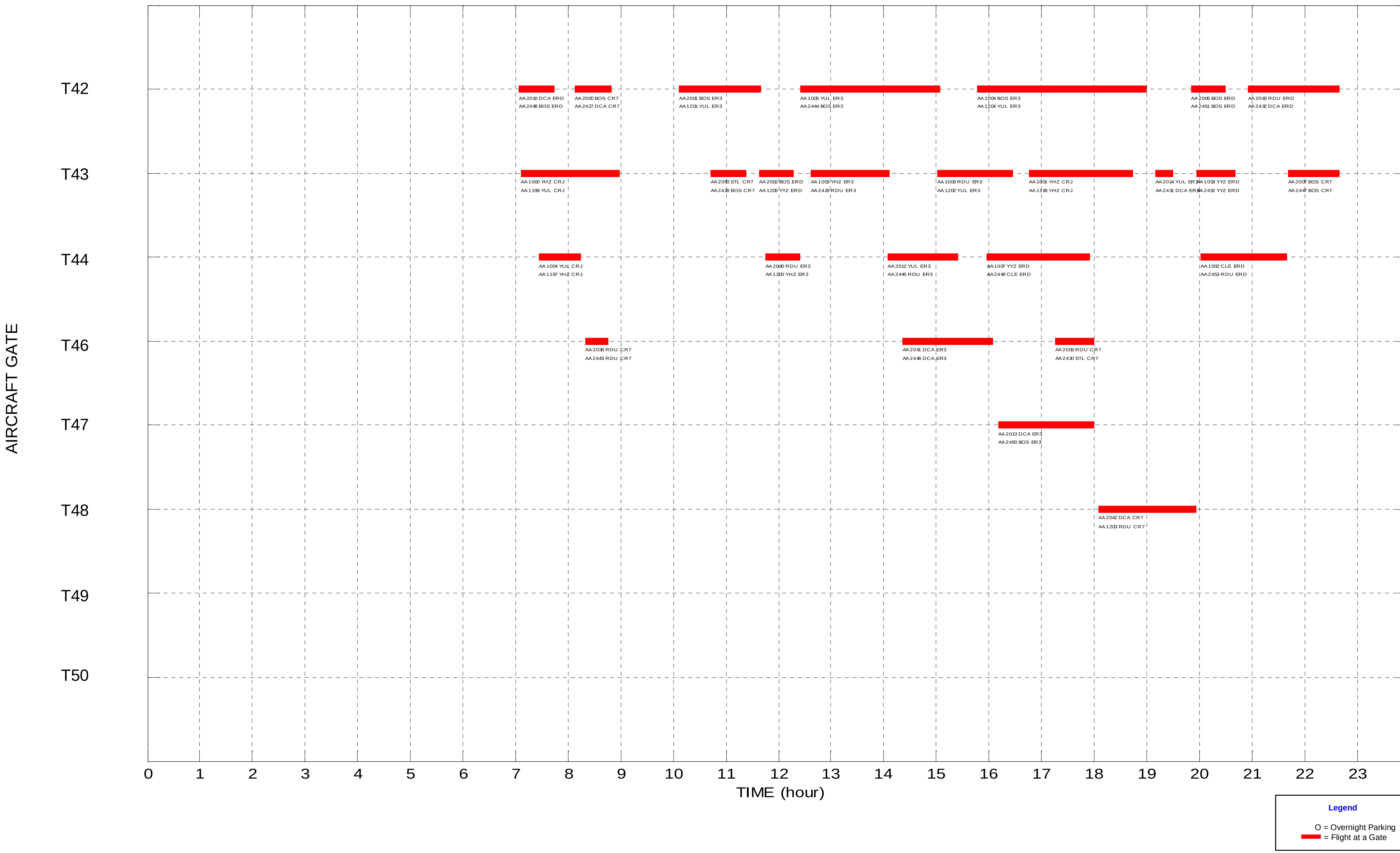


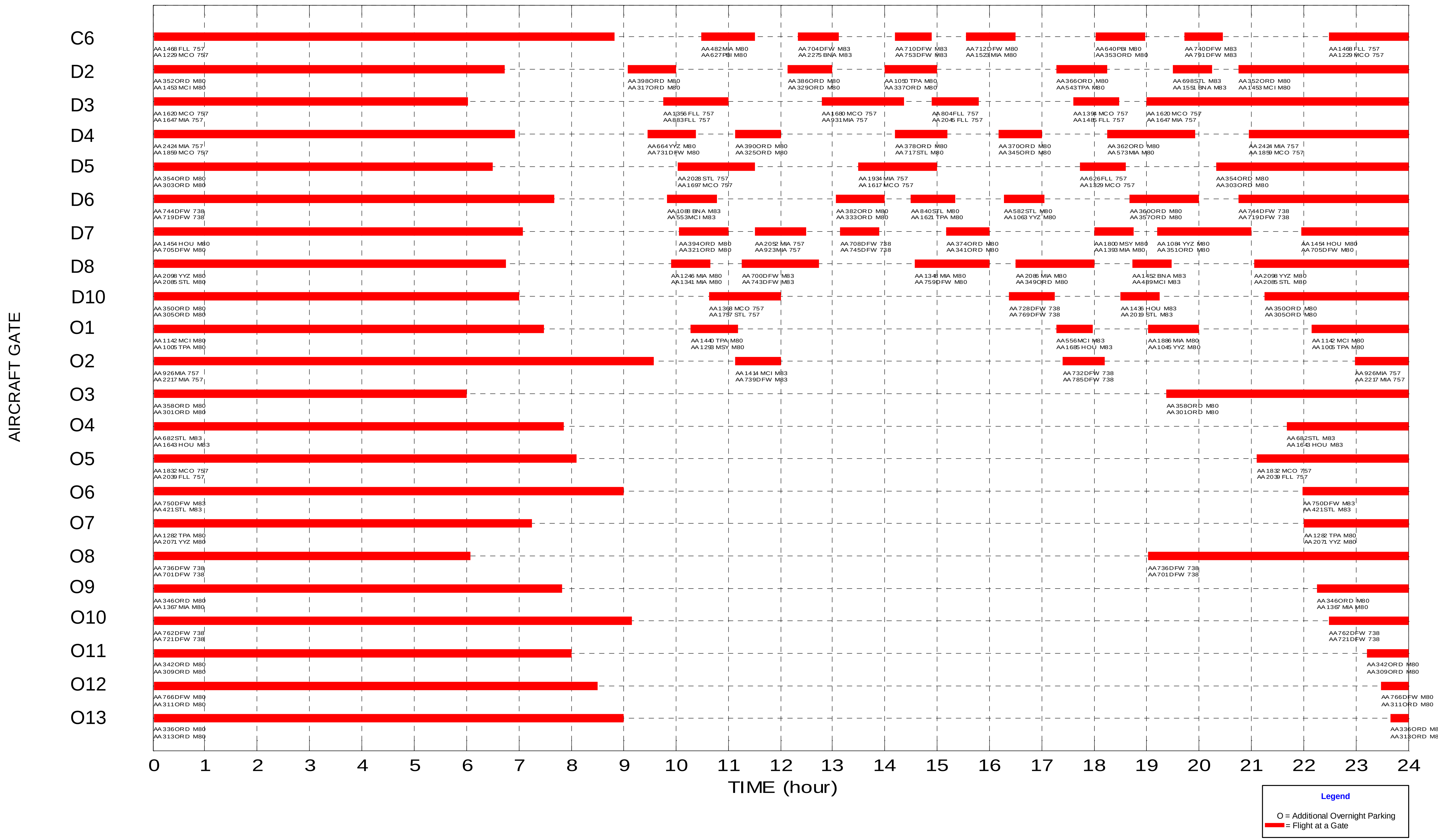
John F. Kennedy International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL T9- IN 2015

EXHIBIT 8

PB AVIATION



LaGuardia Airport

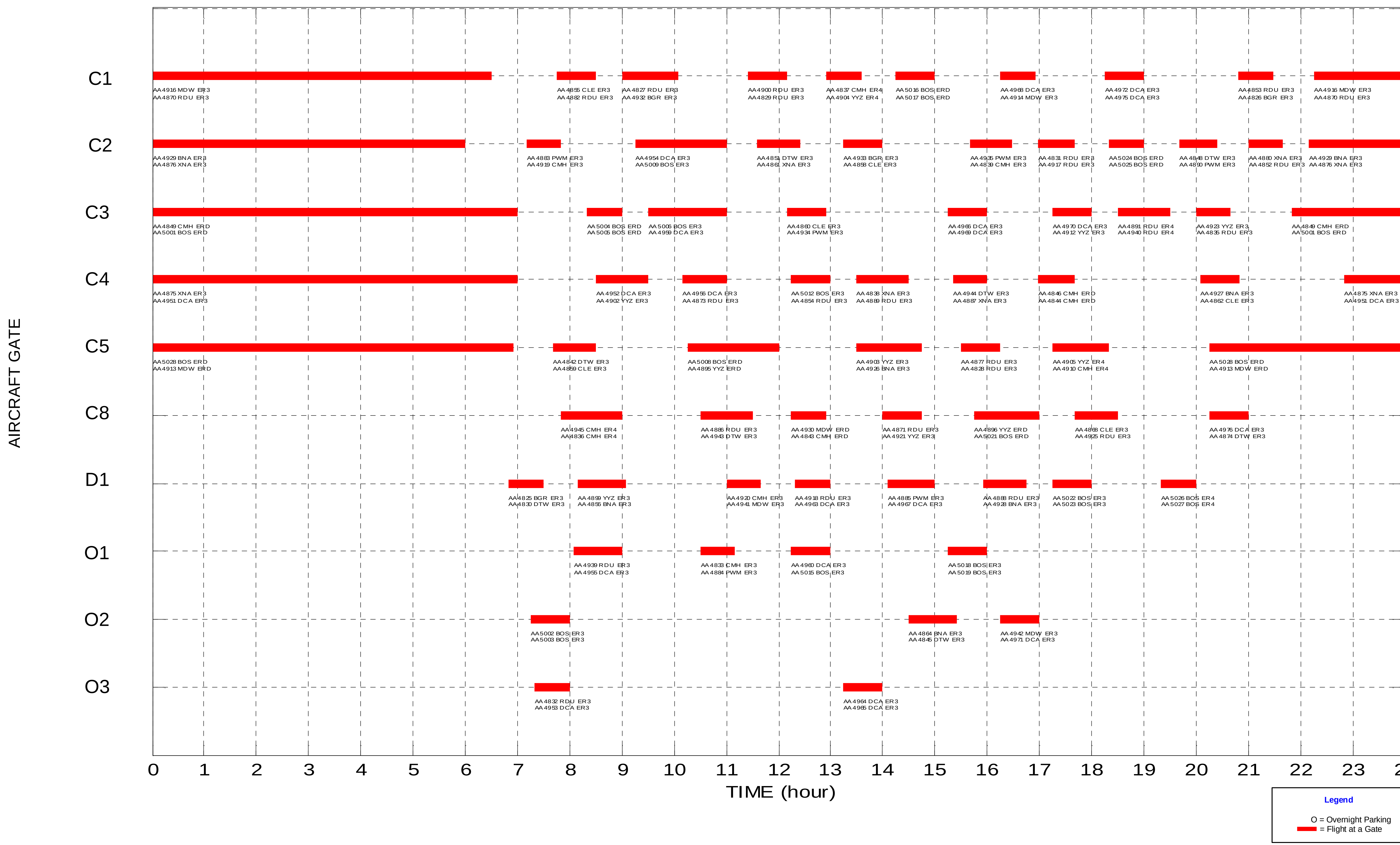
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT CENTRAL TERMINAL C AND D - AMERICAN AIRLINES IN 2004

EXHIBIT 9

PB AVIATION

XX



LaGuardia Airport

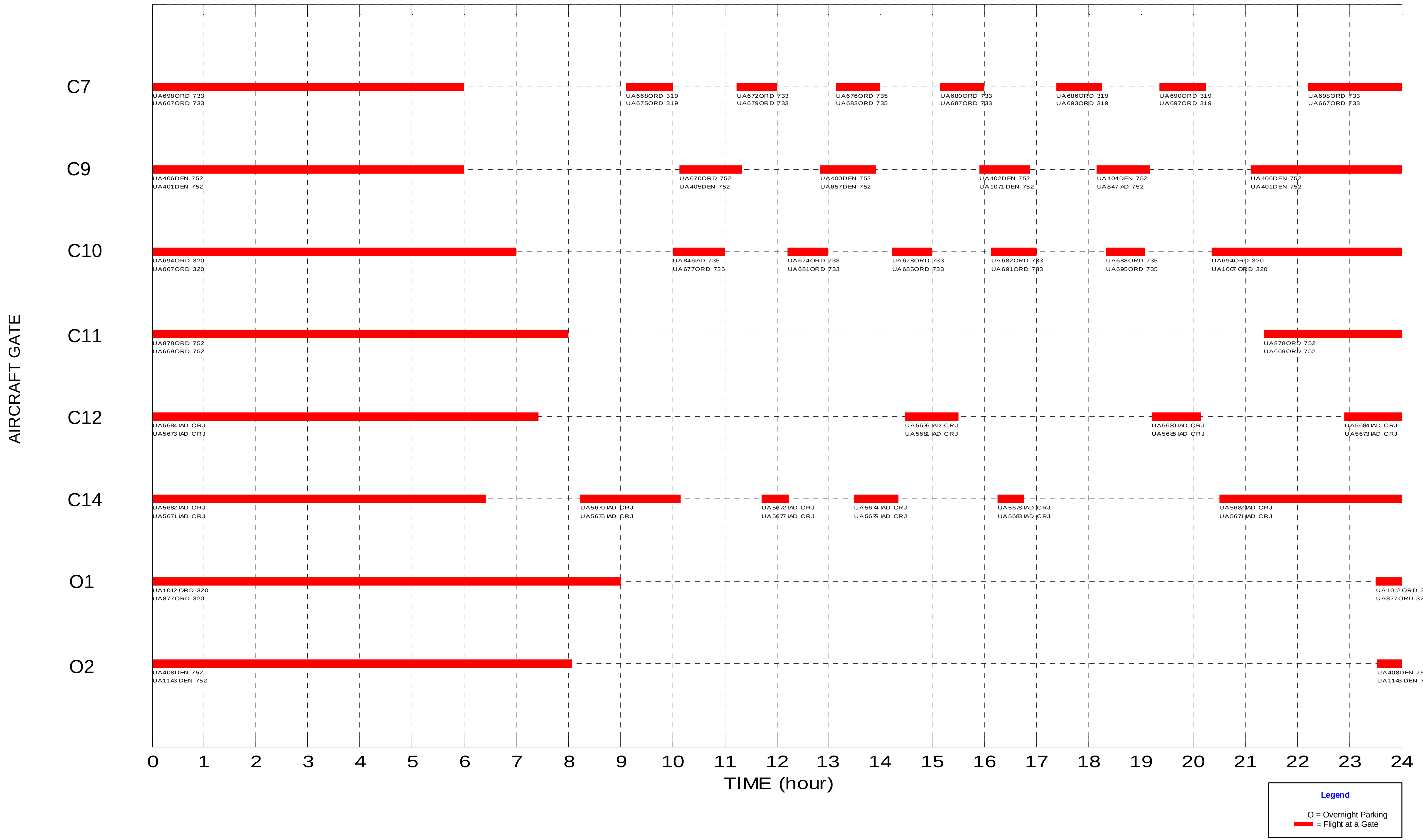
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT CENTRAL TERMINAL C - AMERICAN EAGLE IN 2004

EXHIBIT 7

PB AVIATION

XX



LaGuardia Airport

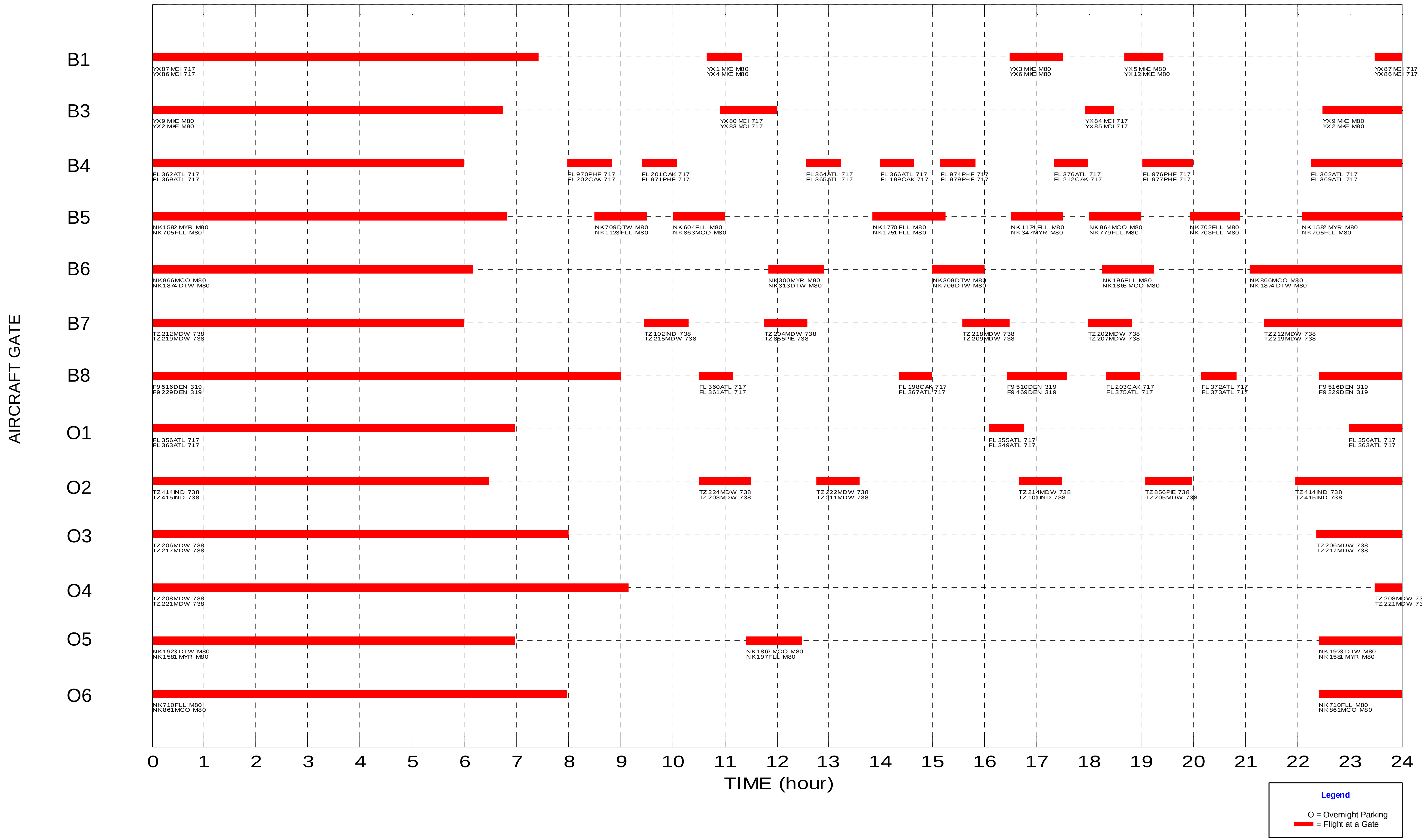
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT CENTRAL TERMINAL C - UNITED AIRLINES IN 2004

EXHIBIT 8

PB AVIATION

XX



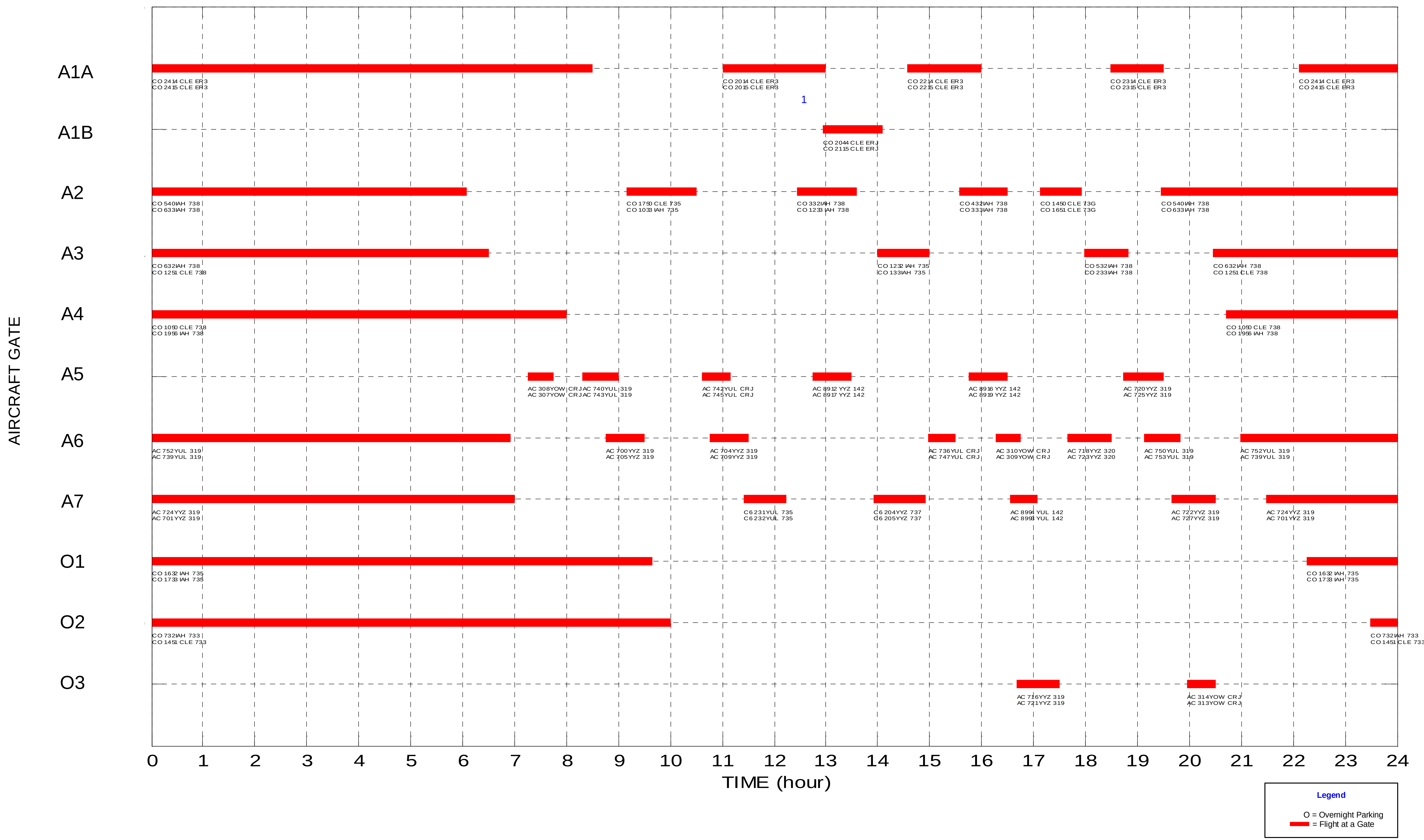
LaGuardia Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT CENTRAL TERMINAL B - YX, FL, B6, AND TZ IN 2004

EXHIBIT 6

PB AVIATION



LaGuardia Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT CENTRAL TERMINAL A - CONTINENTAL AIRLINES AND AIR CANADA IN 2004

EXHIBIT 5

PB AVIATION

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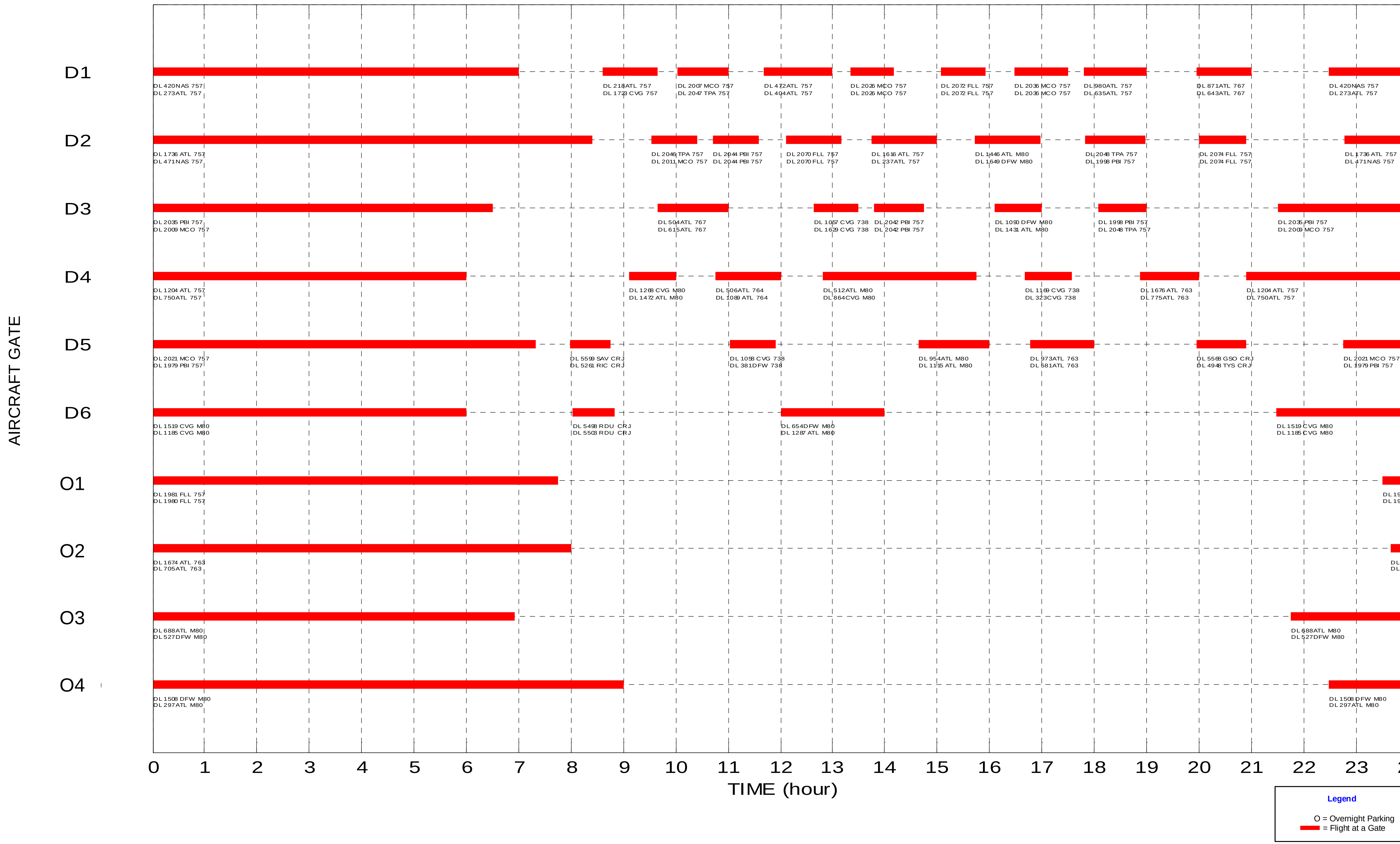


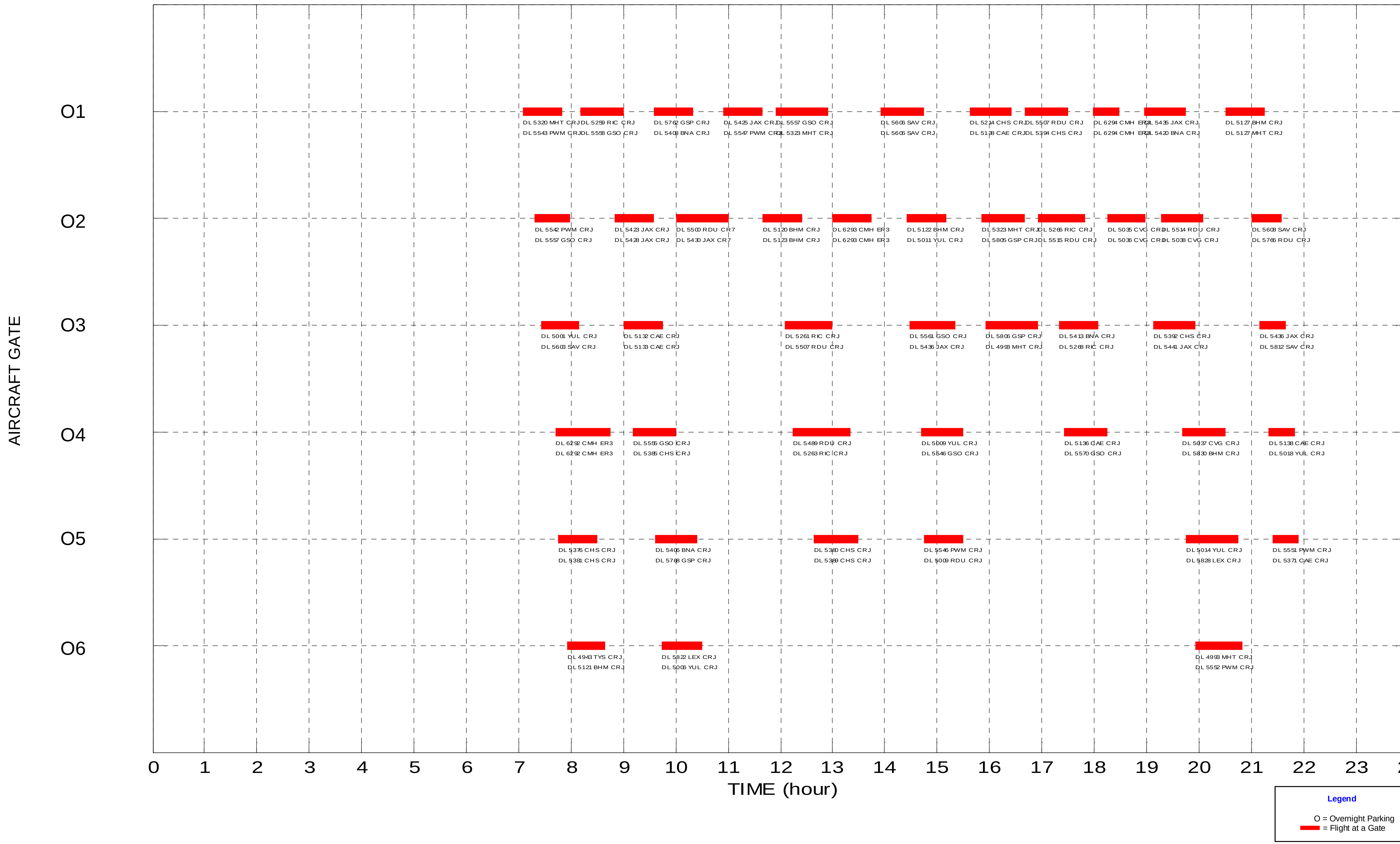
LaGuardia Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT DELTA TERMINAL - DELTA AIRLINES IN 2004

EXHIBIT 1

PB AVIATION



LaGuardia Airport

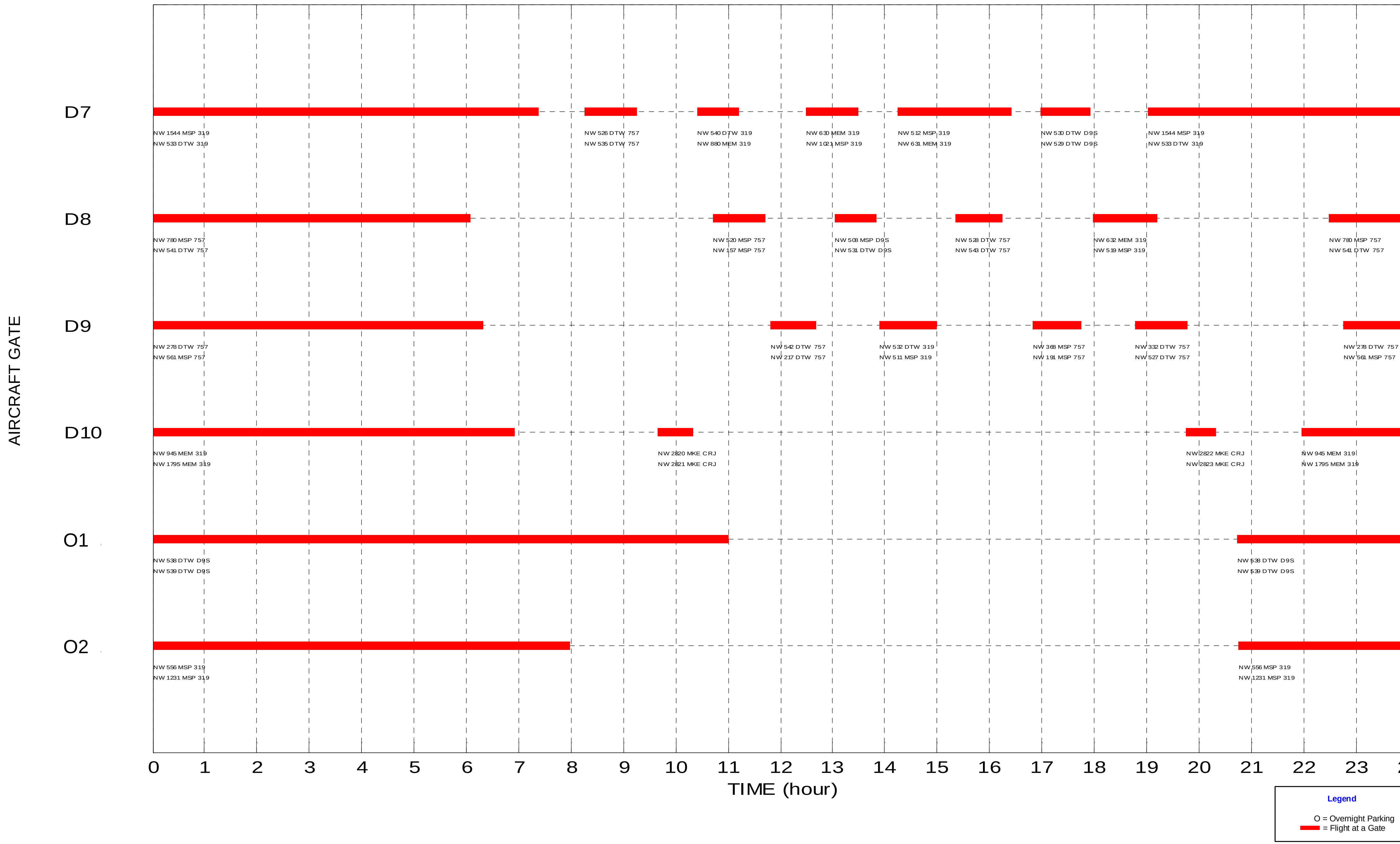
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT EAST END AREA - COMAIR IN 2004

EXHIBIT 10

PB AVIATION

XX



LaGuardia Airport

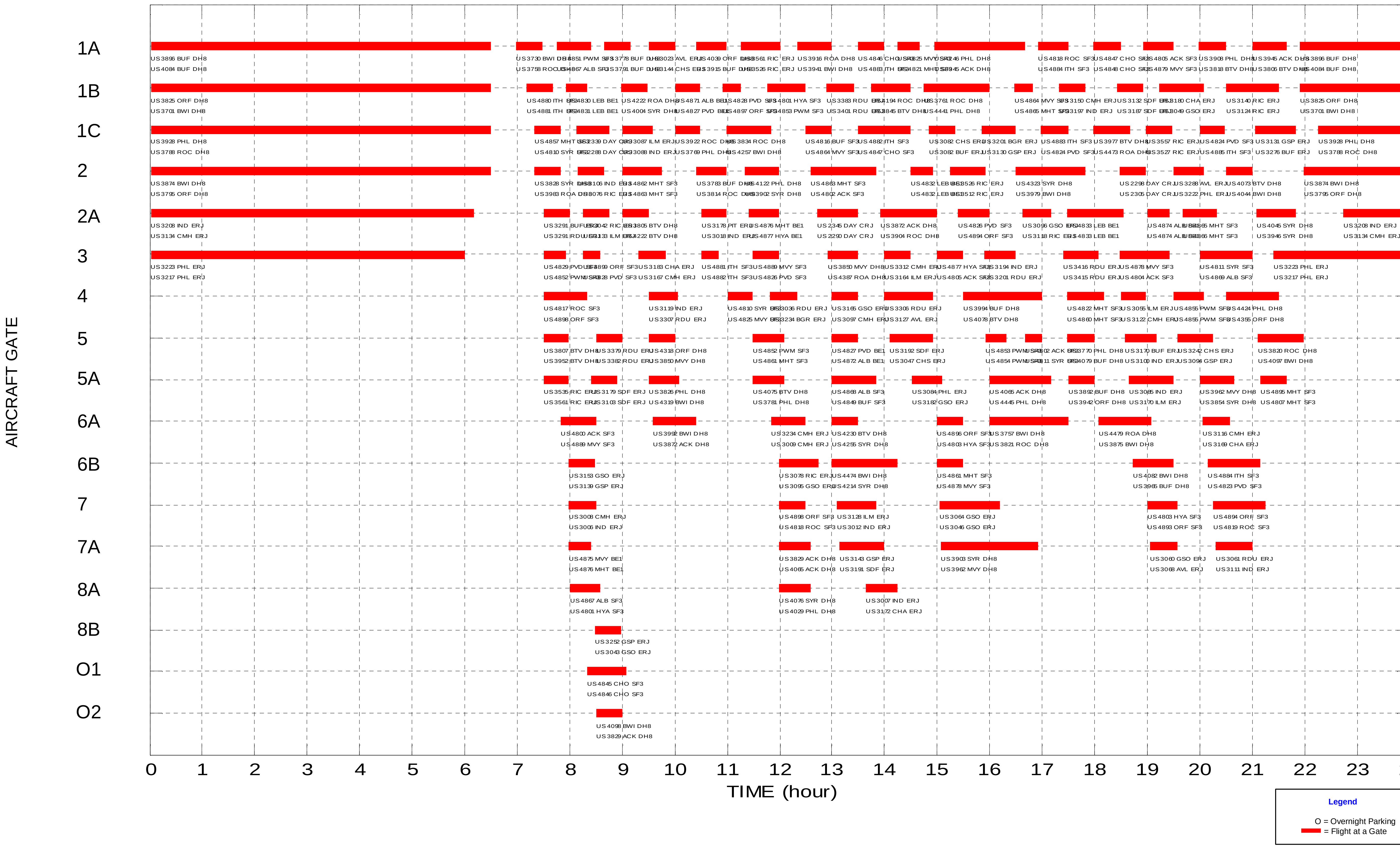
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT DELTA TERMINAL - NORTHWEST AIRLINES IN 2004

EXHIBIT 2

PB AVIATION

XX



LaGuardia Airport

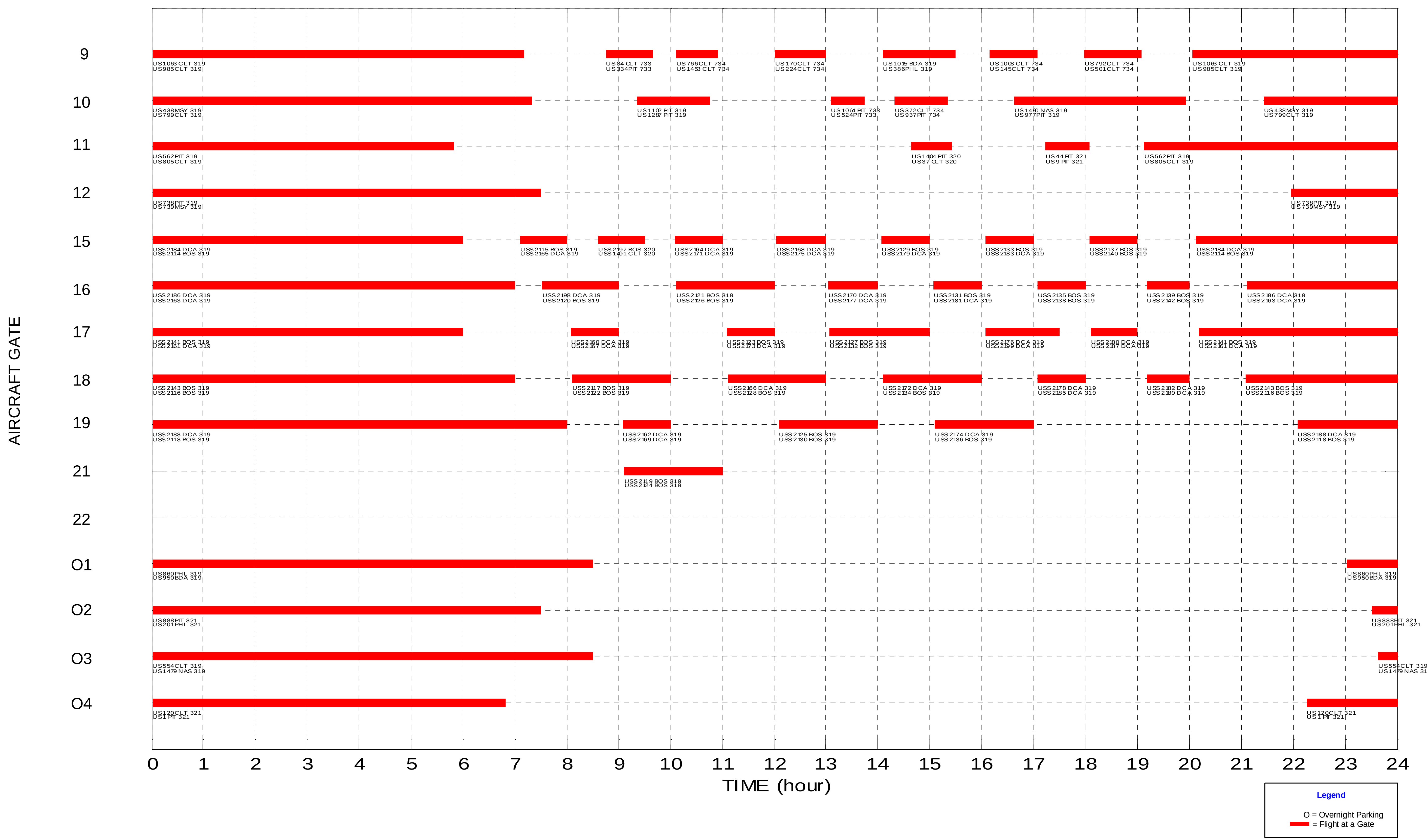
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT U. S. AIR TERMINAL - US EXPRESS IN 2004

EXHIBIT 4

XX

PB AVIATION



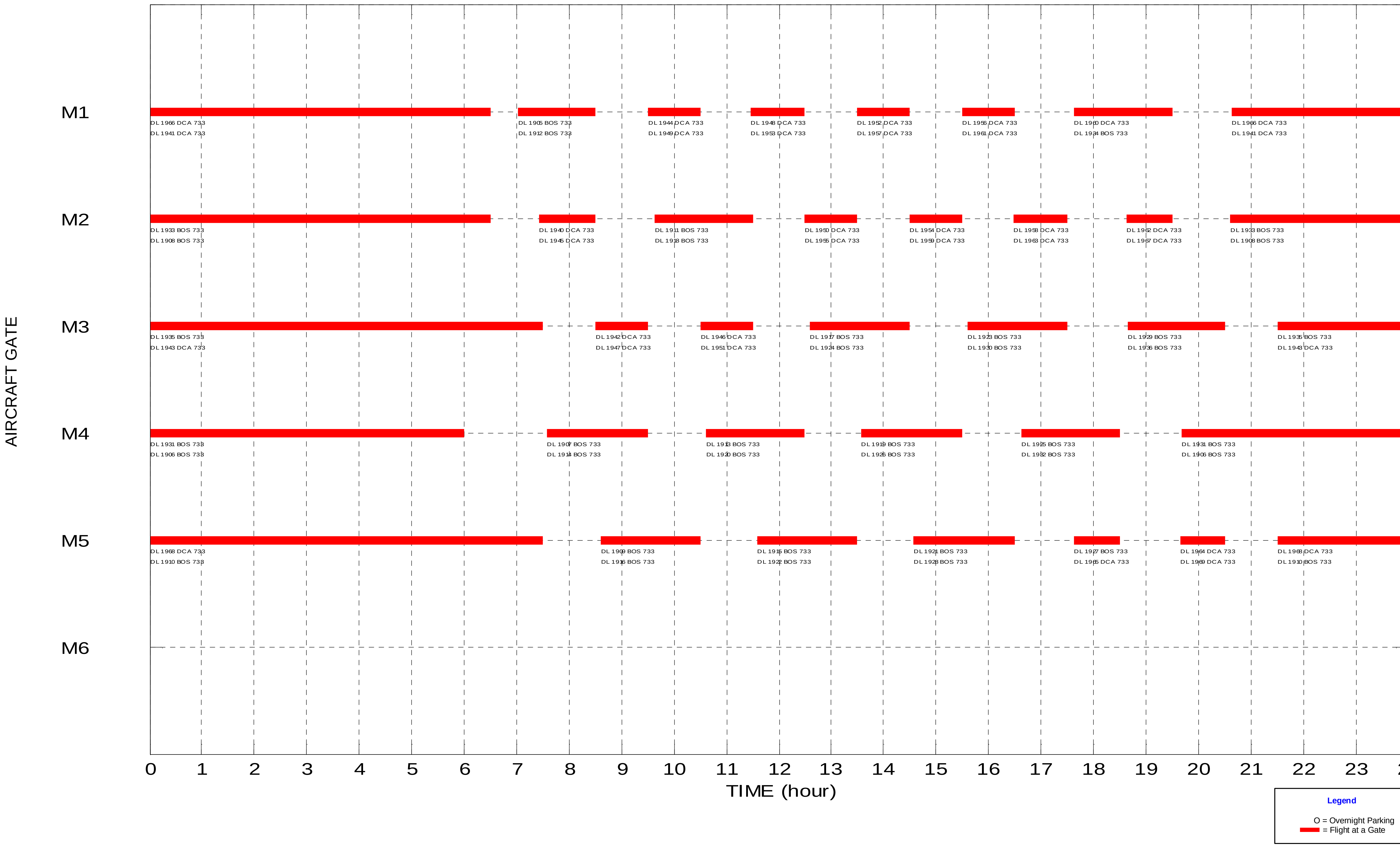
LaGuardia Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT U.S. AIR TERMINAL - US AIRWAYS AND SHUTTLE IN 2004

EXHIBIT 3

PB AVIATION



LaGuardia Airport

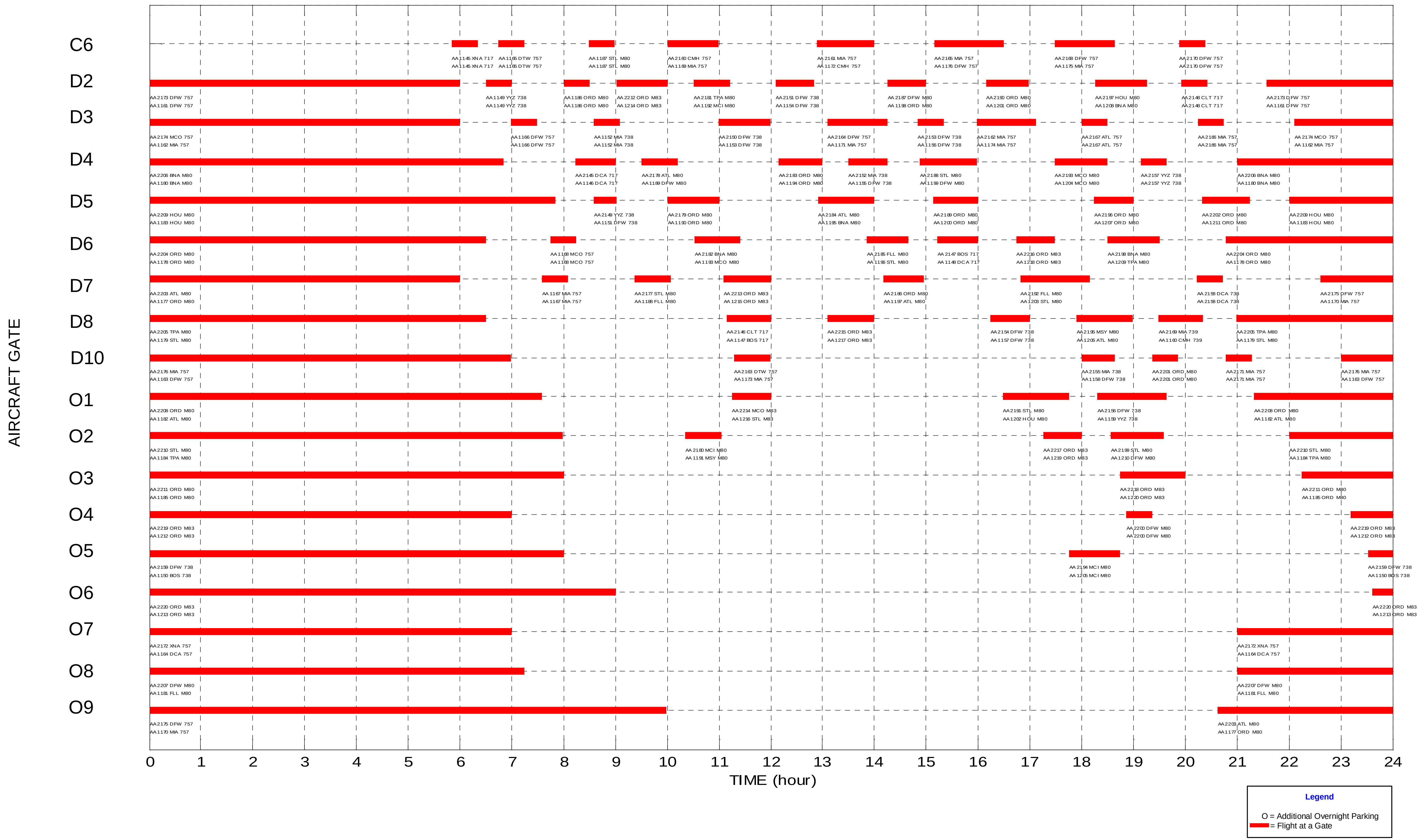
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT MARINE TERMINAL - DELTA SHUTTLE IN 2004

EXHIBIT 11

PB AVIATION

XX



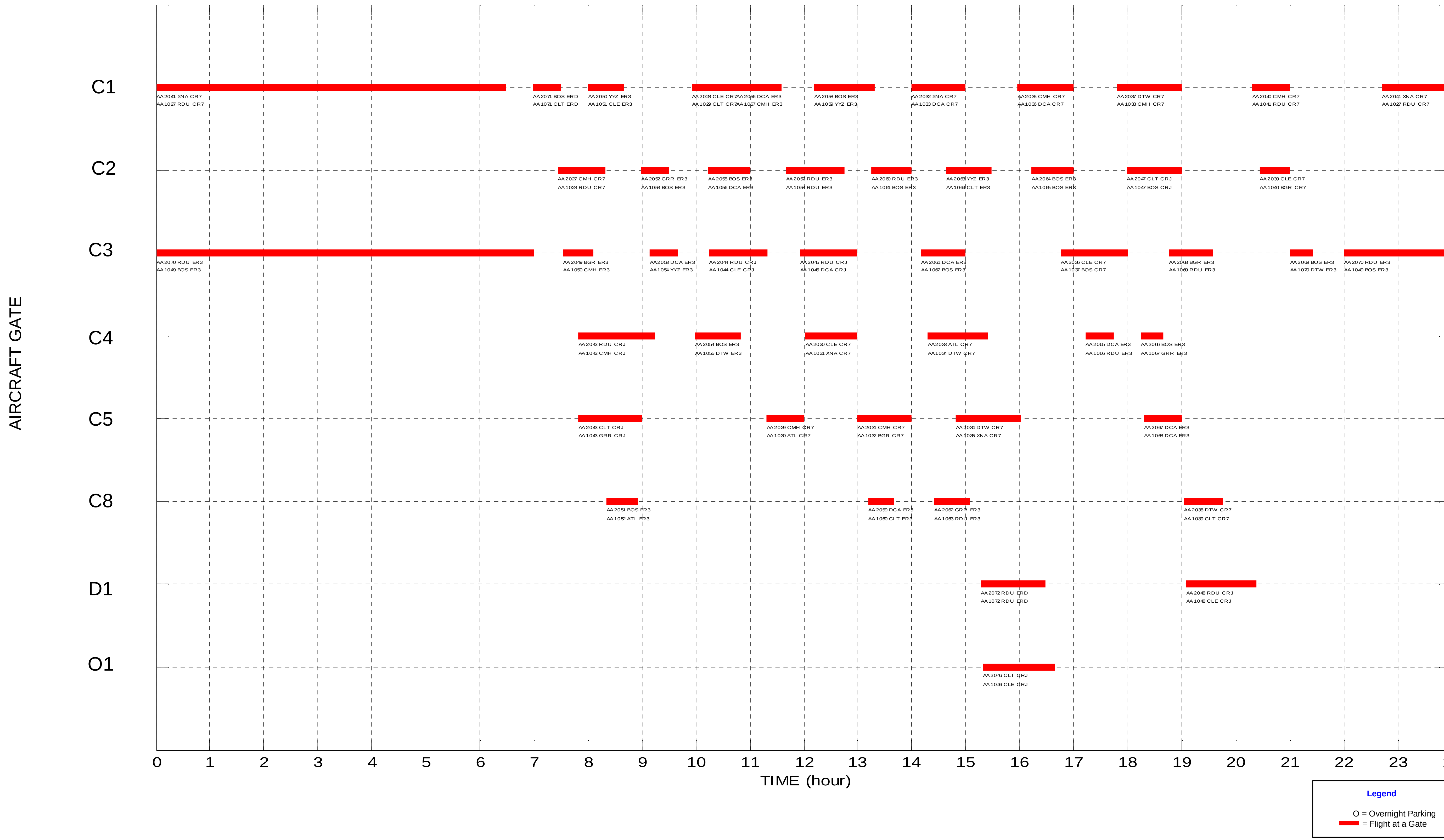
LaGuardia Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT CENTRAL TERMINAL C AND D - AMERICAN AIRLINES IN 2015

EXHIBIT 9

PB AVIATION



LaGuardia Airport

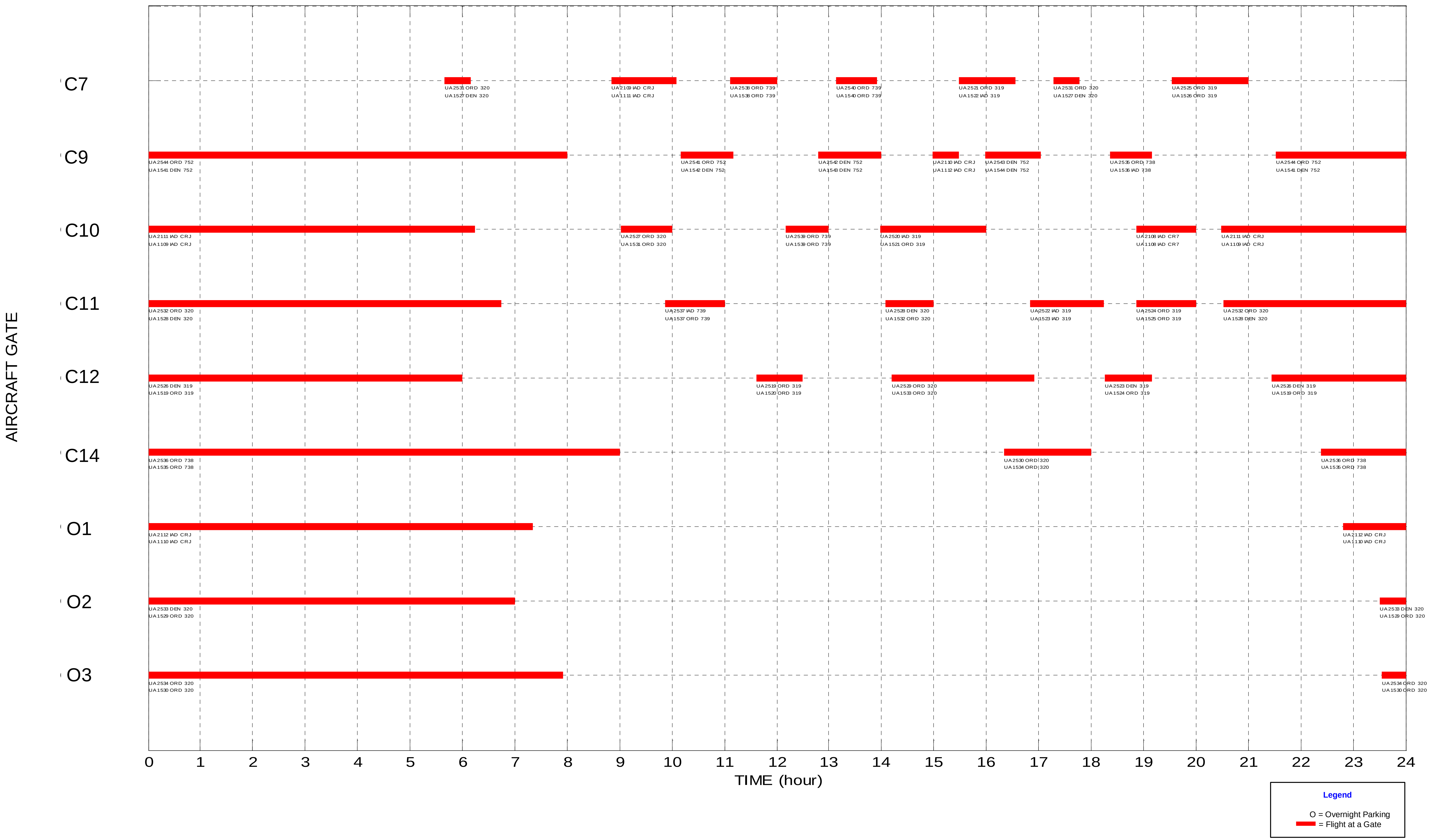
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT CENTRAL TERMINAL C - AMERICAN EAGLE IN 2015

EXHIBIT 7

PB AVIATION

XX



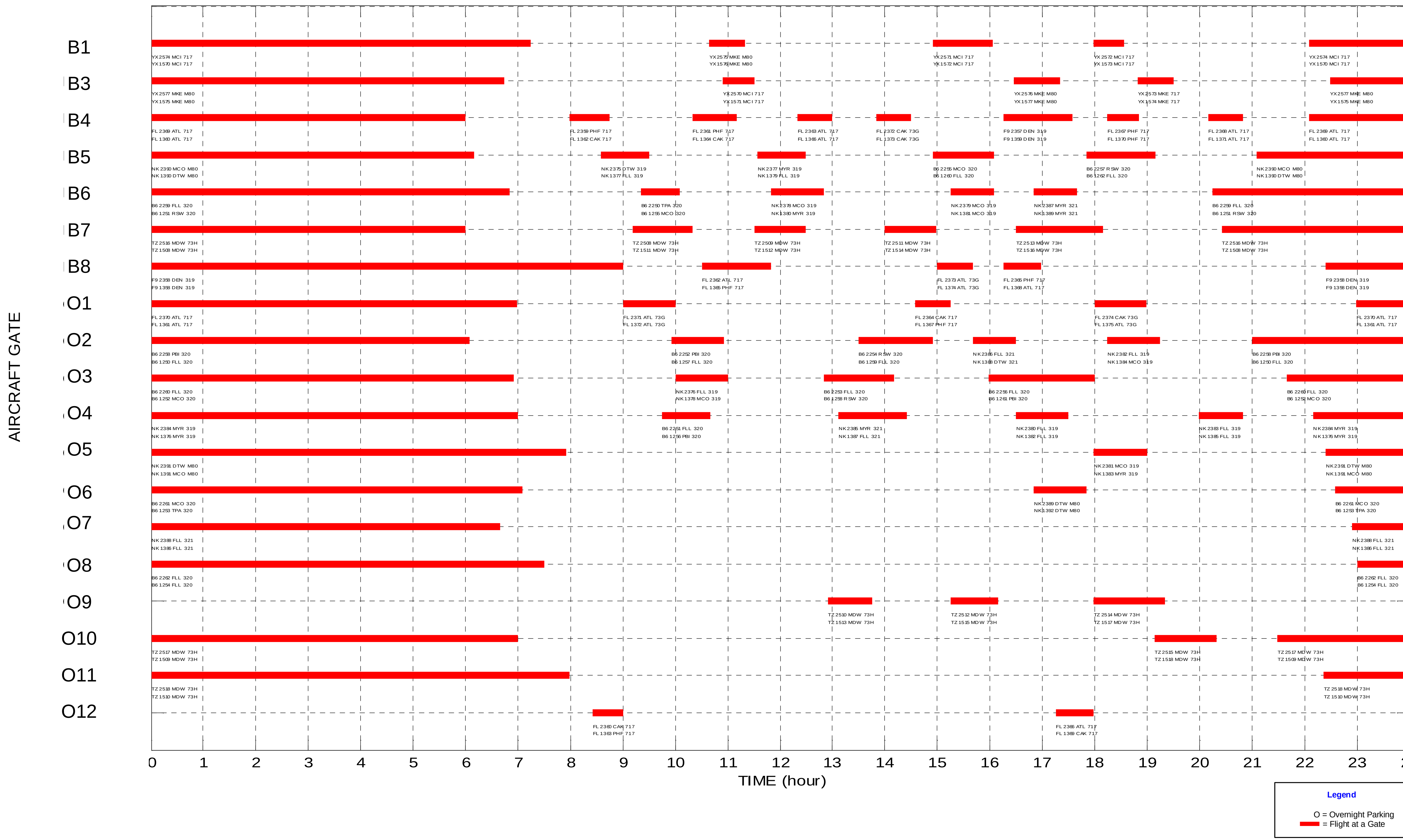
LaGuardia Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT CENTRAL TERMINAL C - UNITED AIRLINES IN 2015

EXHIBIT 8

PB AVIATION



LaGuardia Airport

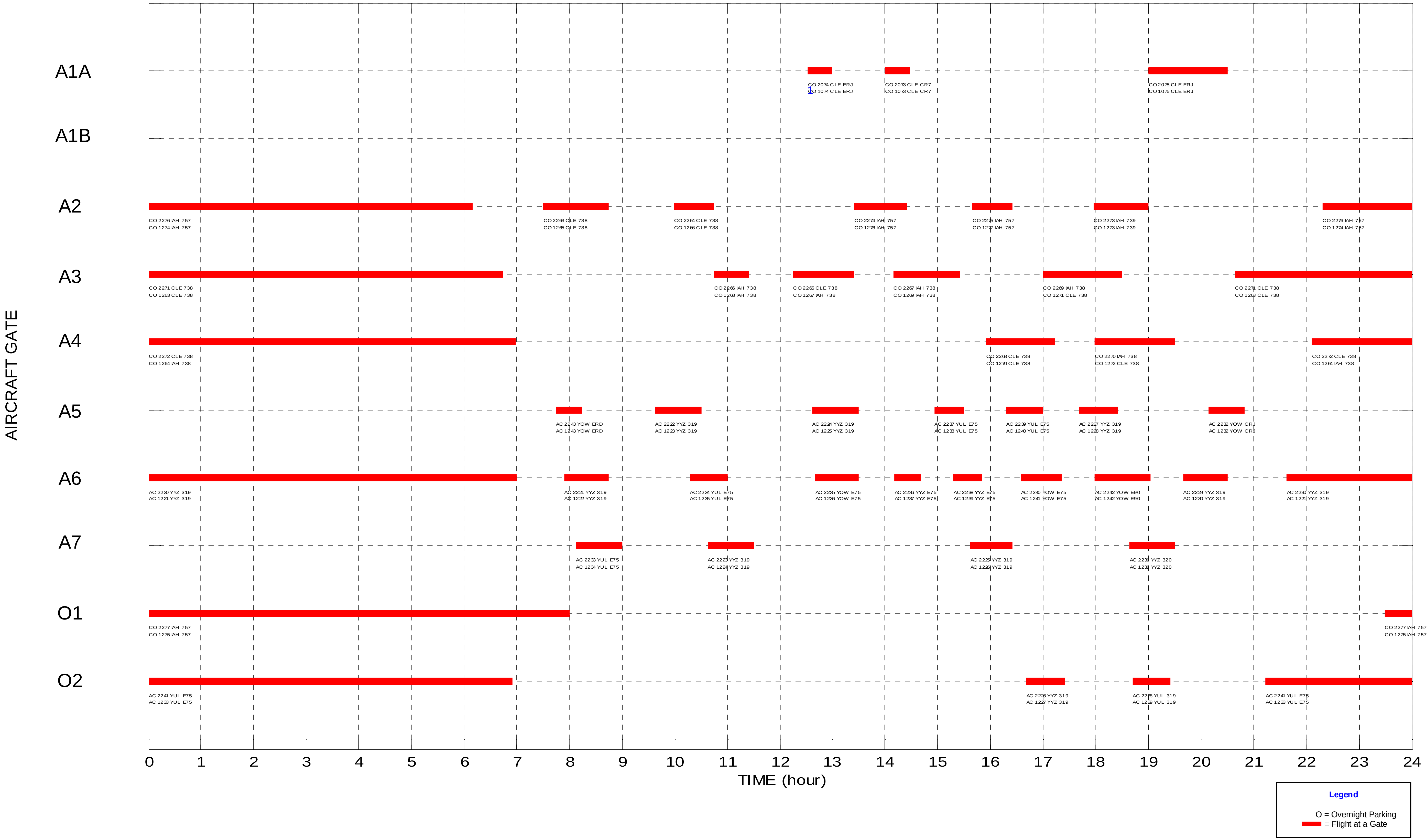
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT CENTRAL TERMINAL B - YX, FL, B6, AND TZ IN 2015

EXHIBIT 6

PB AVIATION

XX



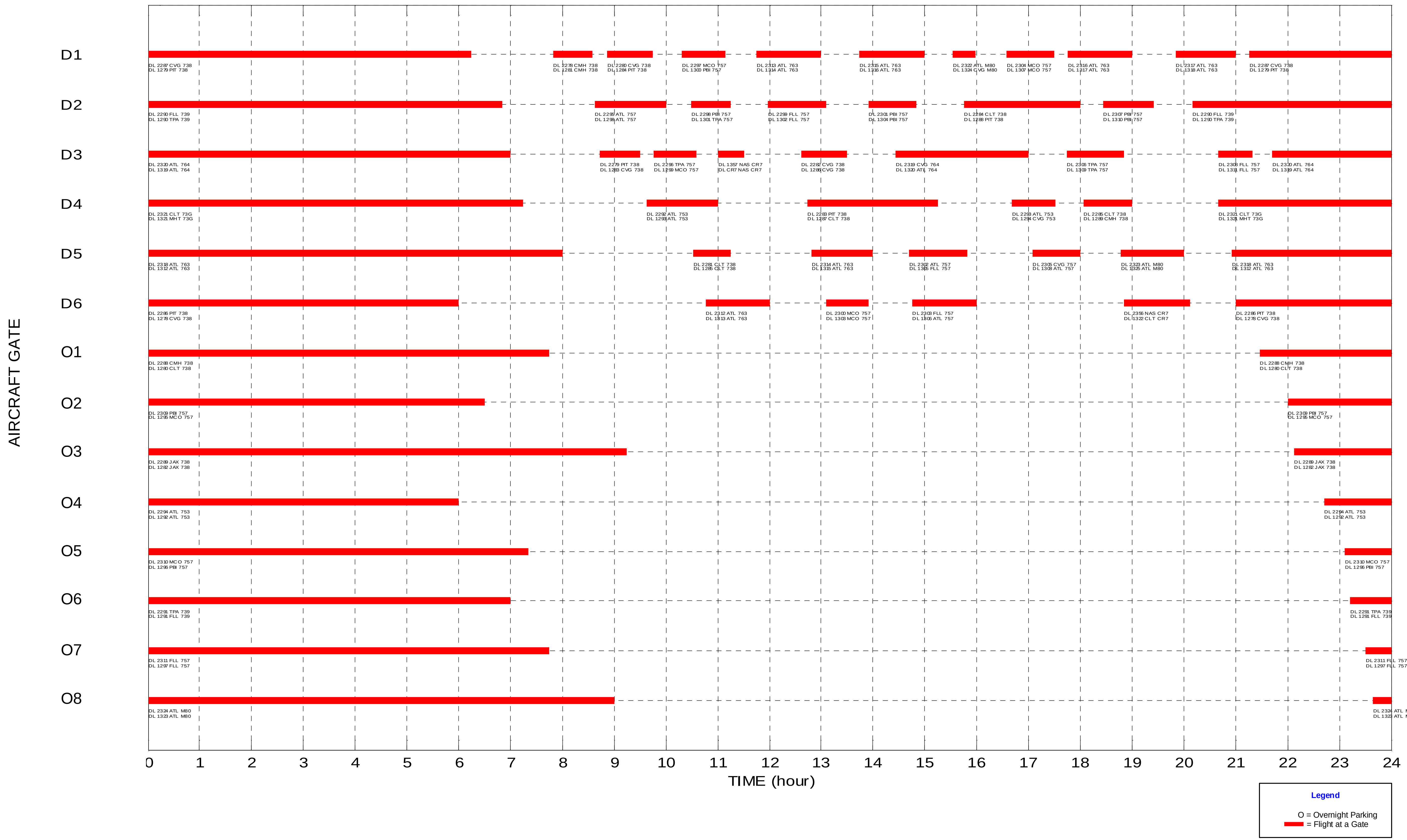
LaGuardia Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT CENTRAL TERMINAL A - CONTINENTAL AIRLINES AND AIR CANADA IN 2015

EXHIBIT 5

PB AVIATION



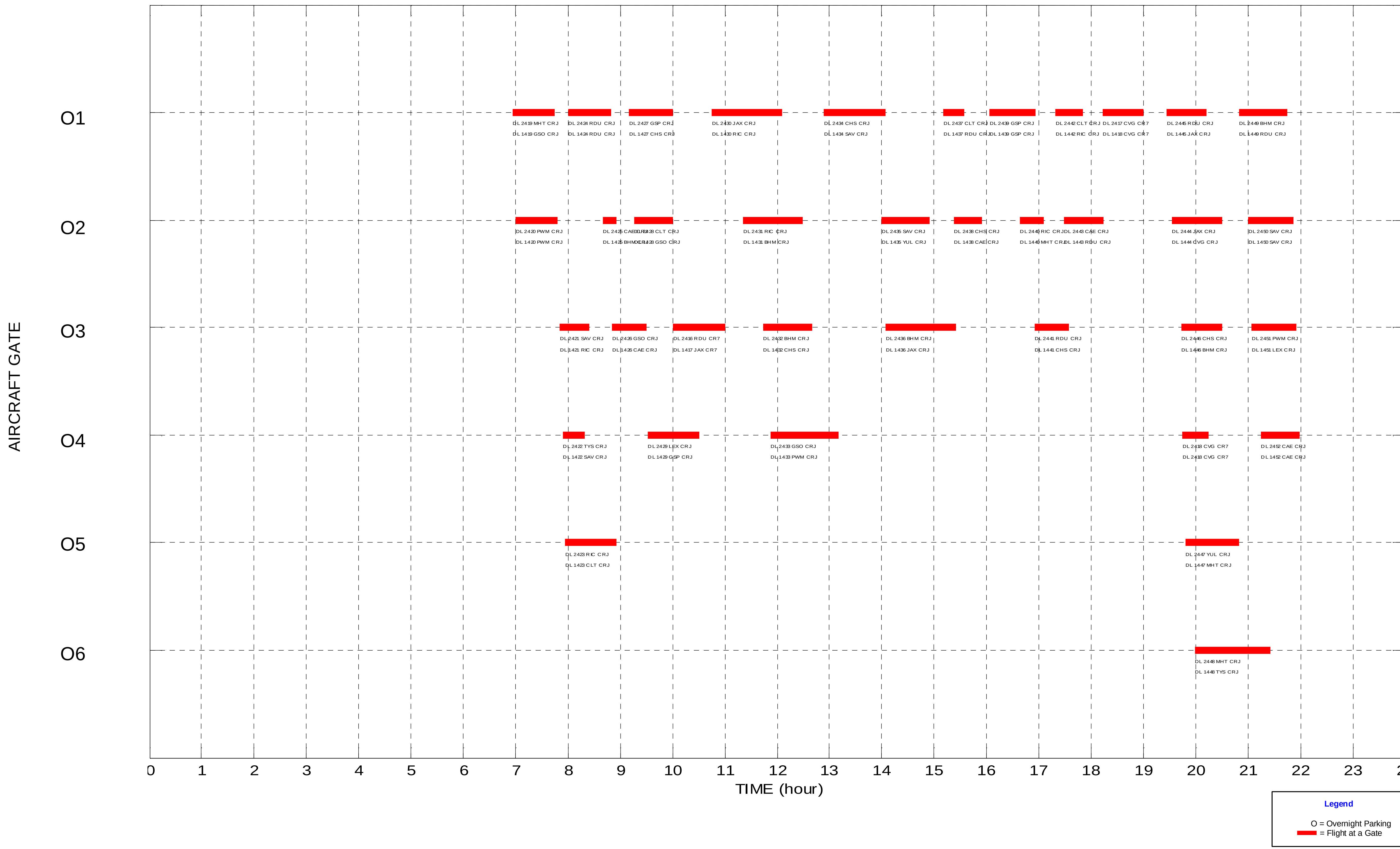
LaGuardia Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT DELTA TERMINAL - DELTA AIRLINES IN 2015

EXHIBIT 1

PB AVIATION



LaGuardia Airport

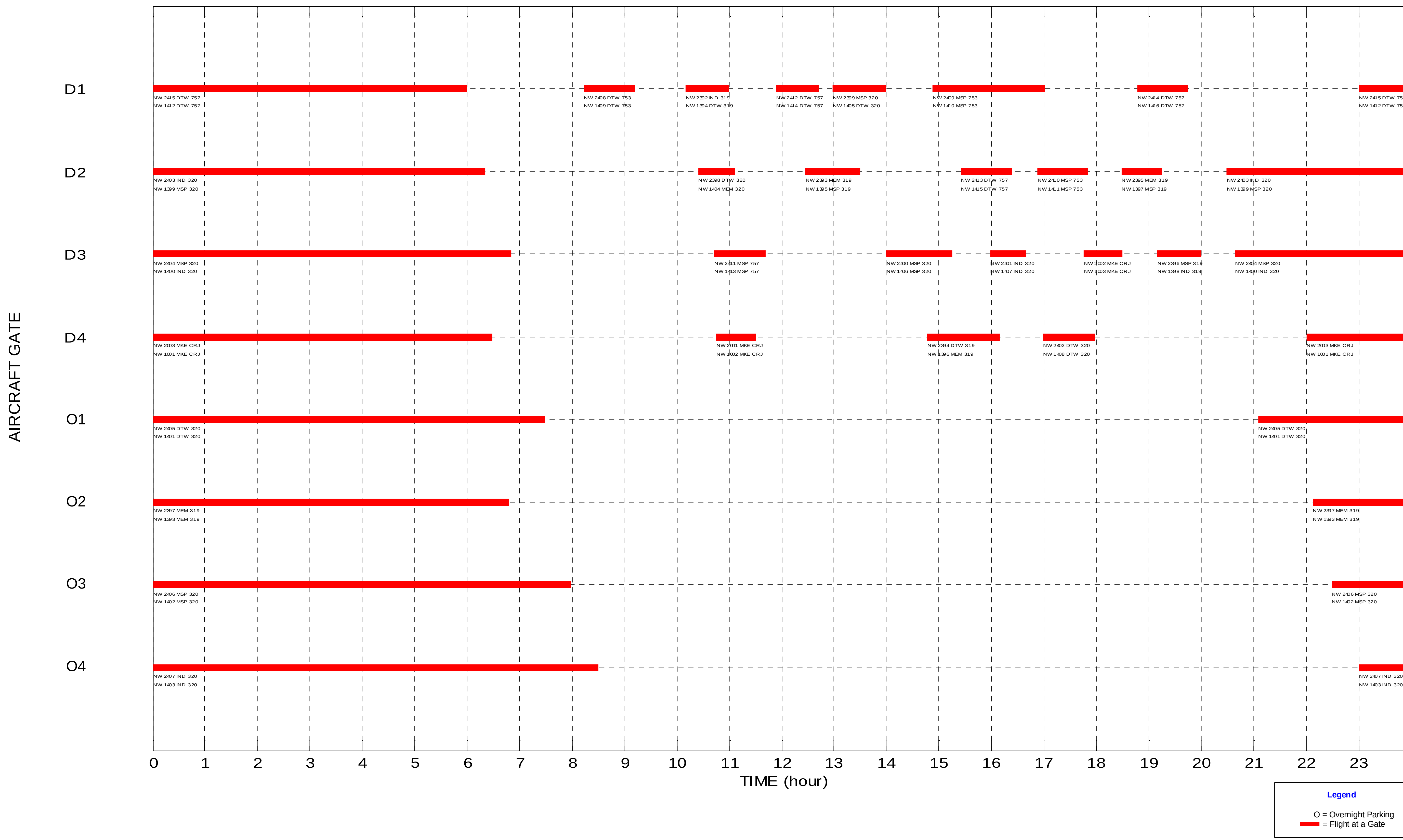
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT EAST END AREA - COMAIR IN 2015

EXHIBIT 10

PB AVIATION

XX



LaGuardia Airport

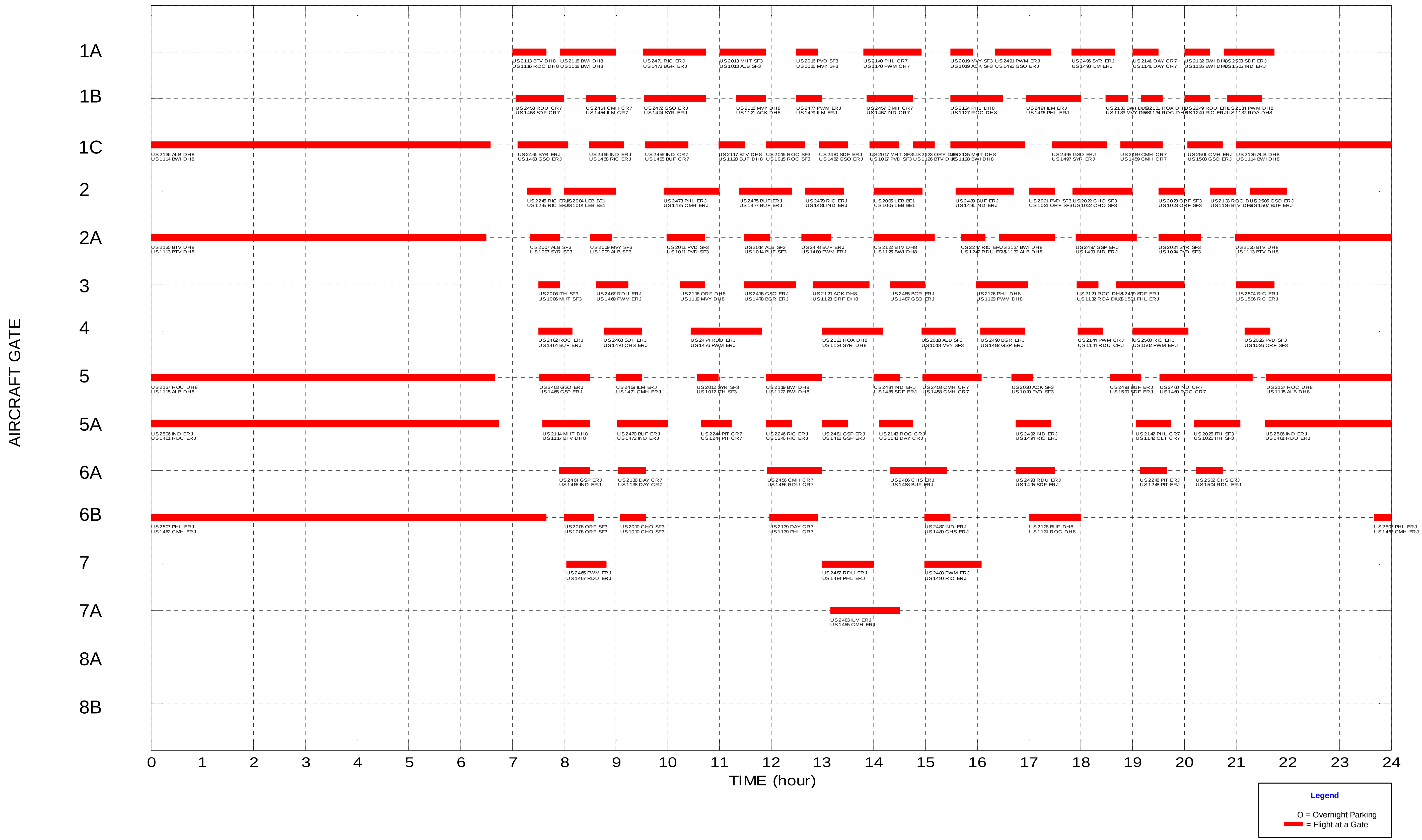
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT DELTA TERMINAL - NORTHWEST AIRLINES IN 2015

EXHIBIT 2

PB AVIATION

XX



LaGuardia Airport

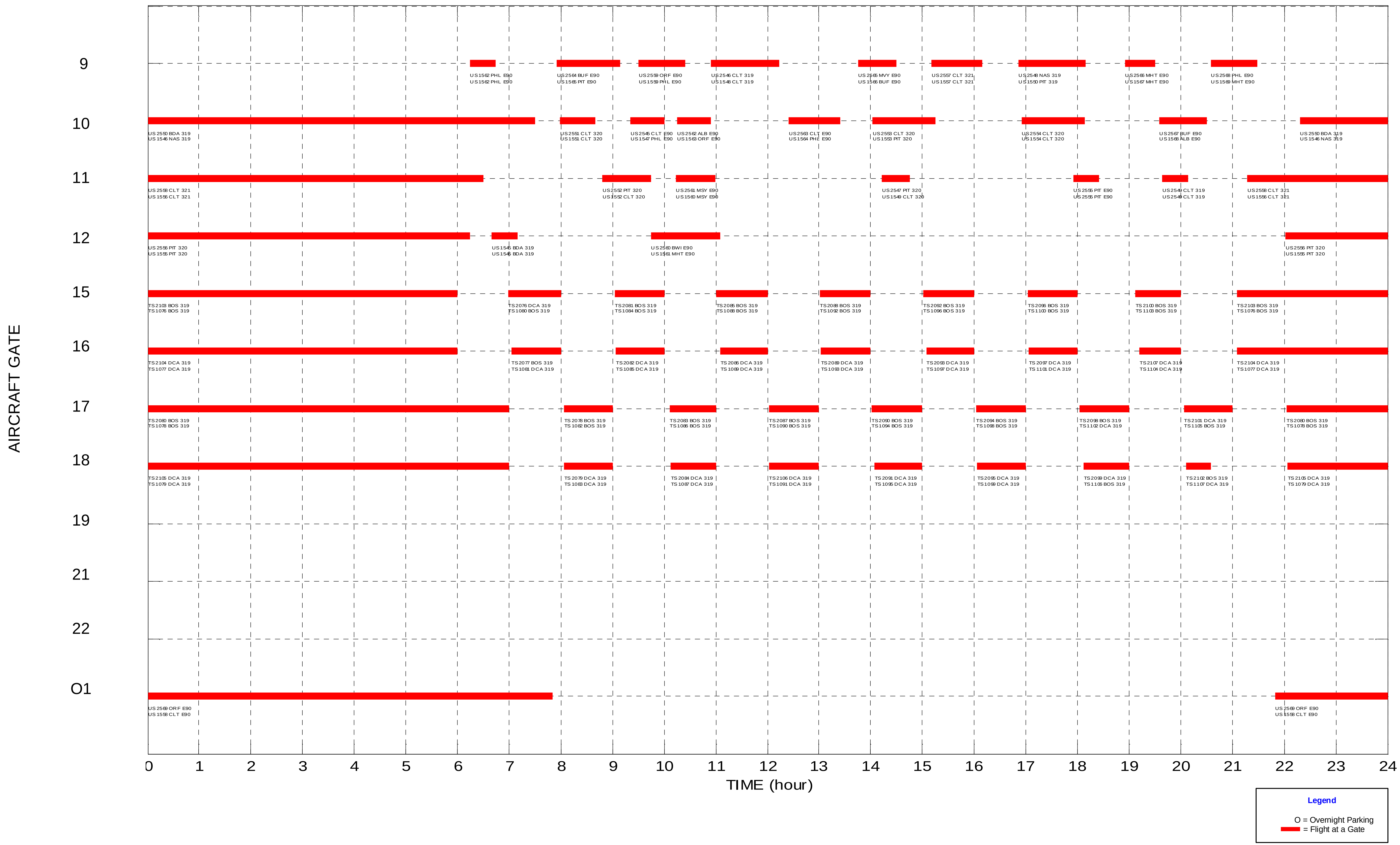
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT U. S. AIR TERMINAL - US EXPRESS IN 2015

EXHIBIT 4

XX

PB AVIATION



LaGuardia Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

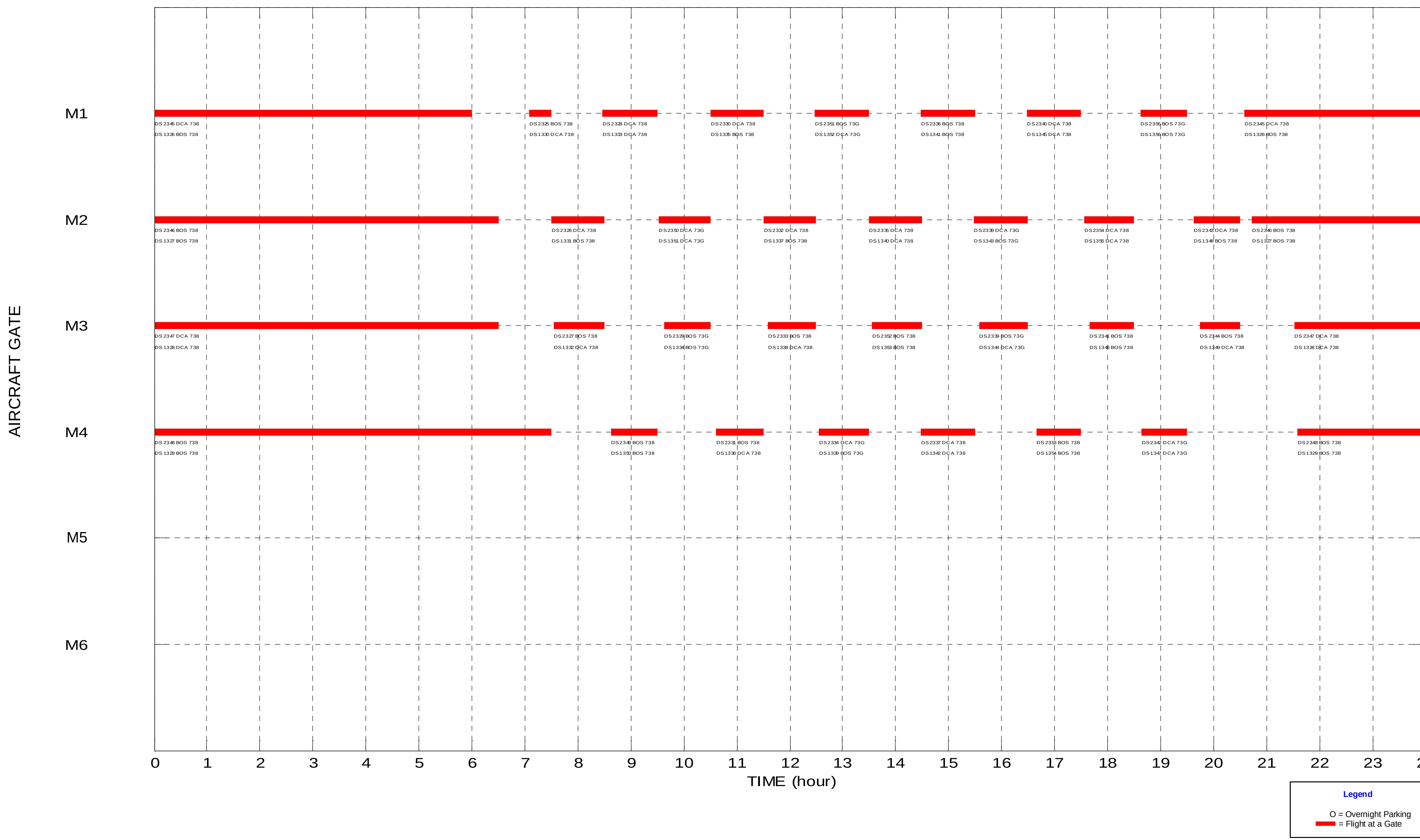
AIRCRAFT RAMP CHART
AT U.S. AIR TERMINAL -
US AIRWAYS AND SHUTTLE IN 2015

EXHIBIT

3

PB AVIATION

XX



LaGuardia Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT MARINE TERMINAL - DELTA SHUTTLE IN 2015

EXHIBIT 11

PB AVIATION

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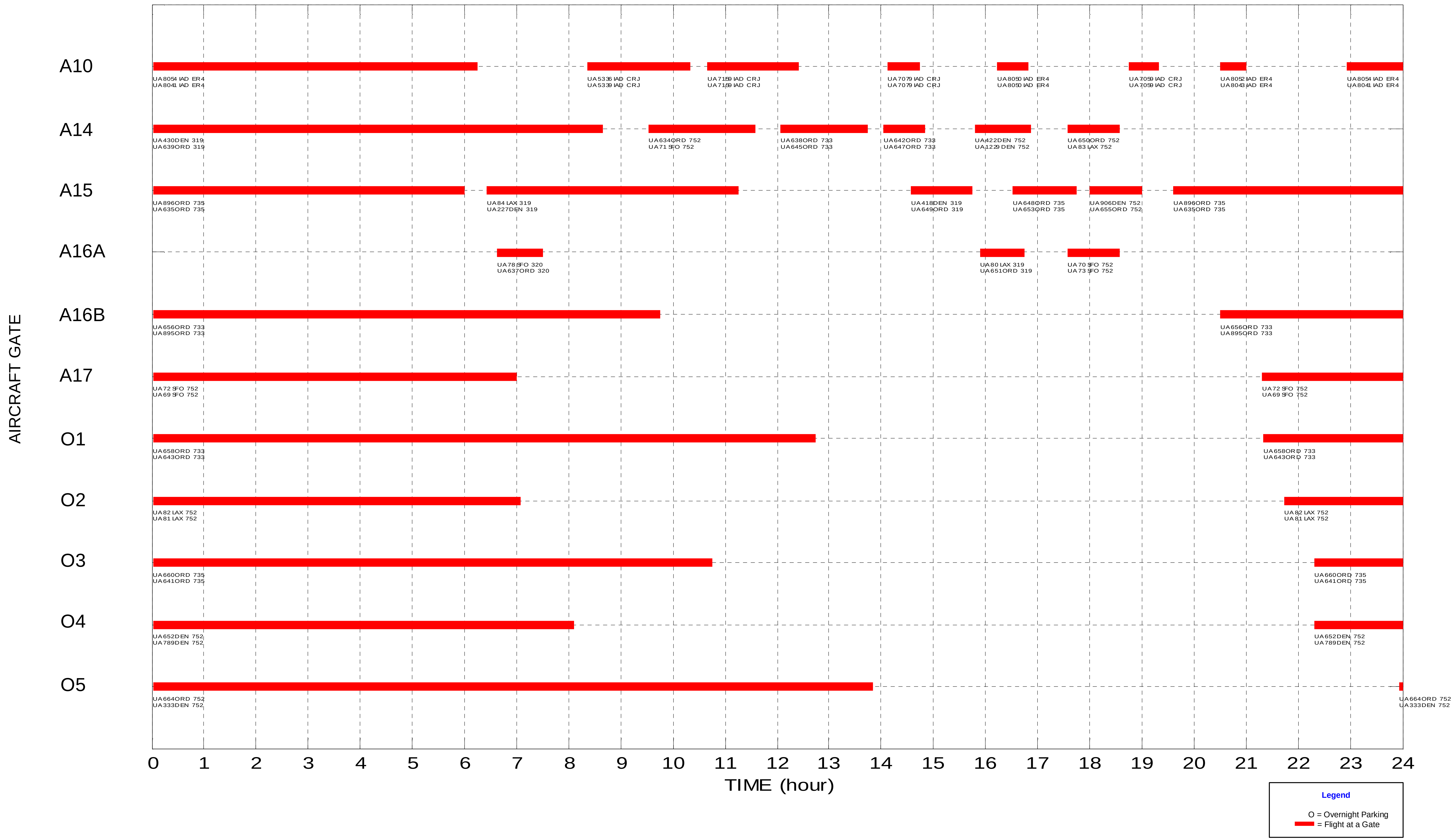


Newark International Airport

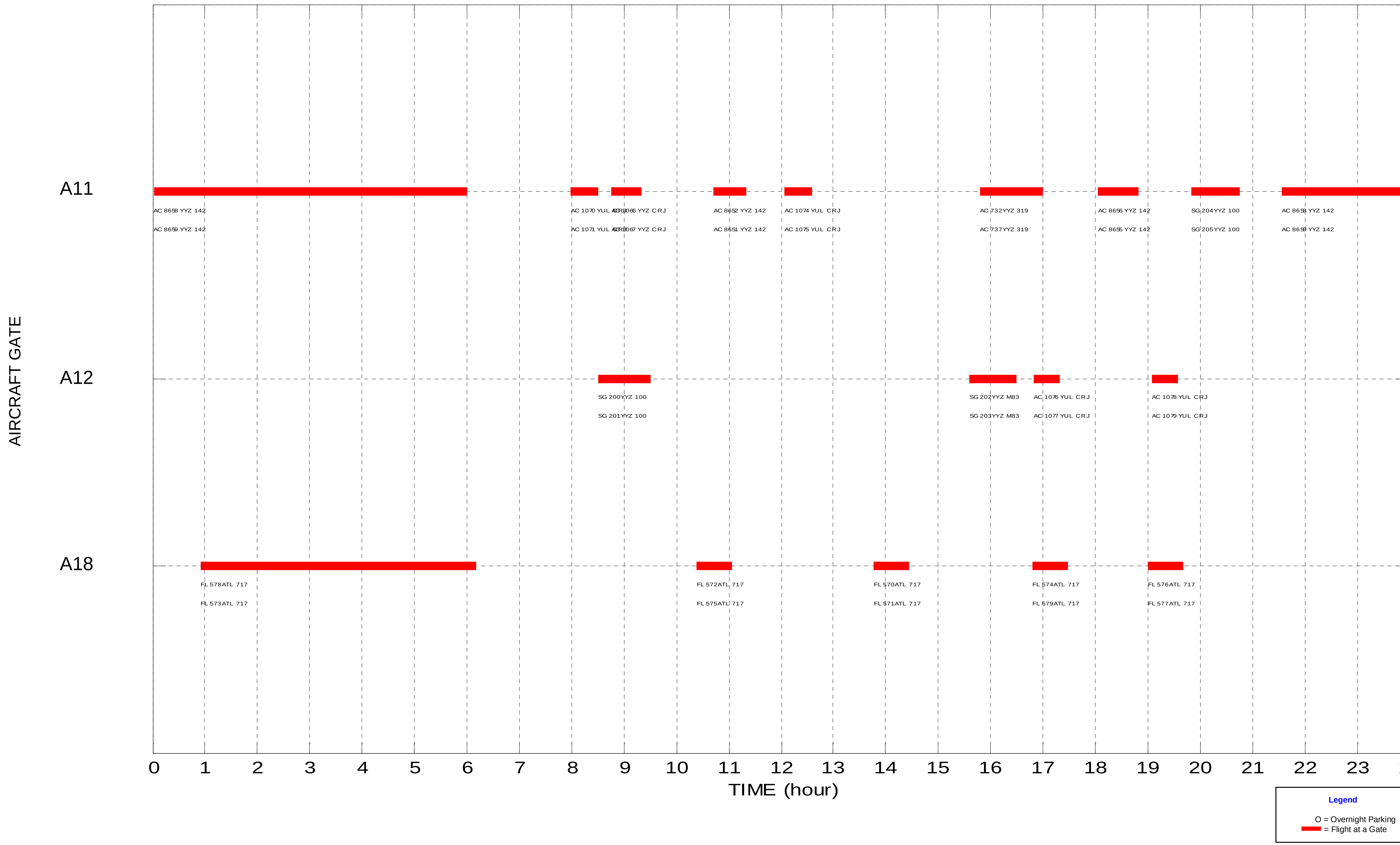
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A1 - UNITED AIRLINES IN 2004

EXHIBIT 1

XX

PB AVIATION



Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A1 - AIR CANADA AND AIRTRAN IN 2004

EXHIBIT 2

PB AVIATION

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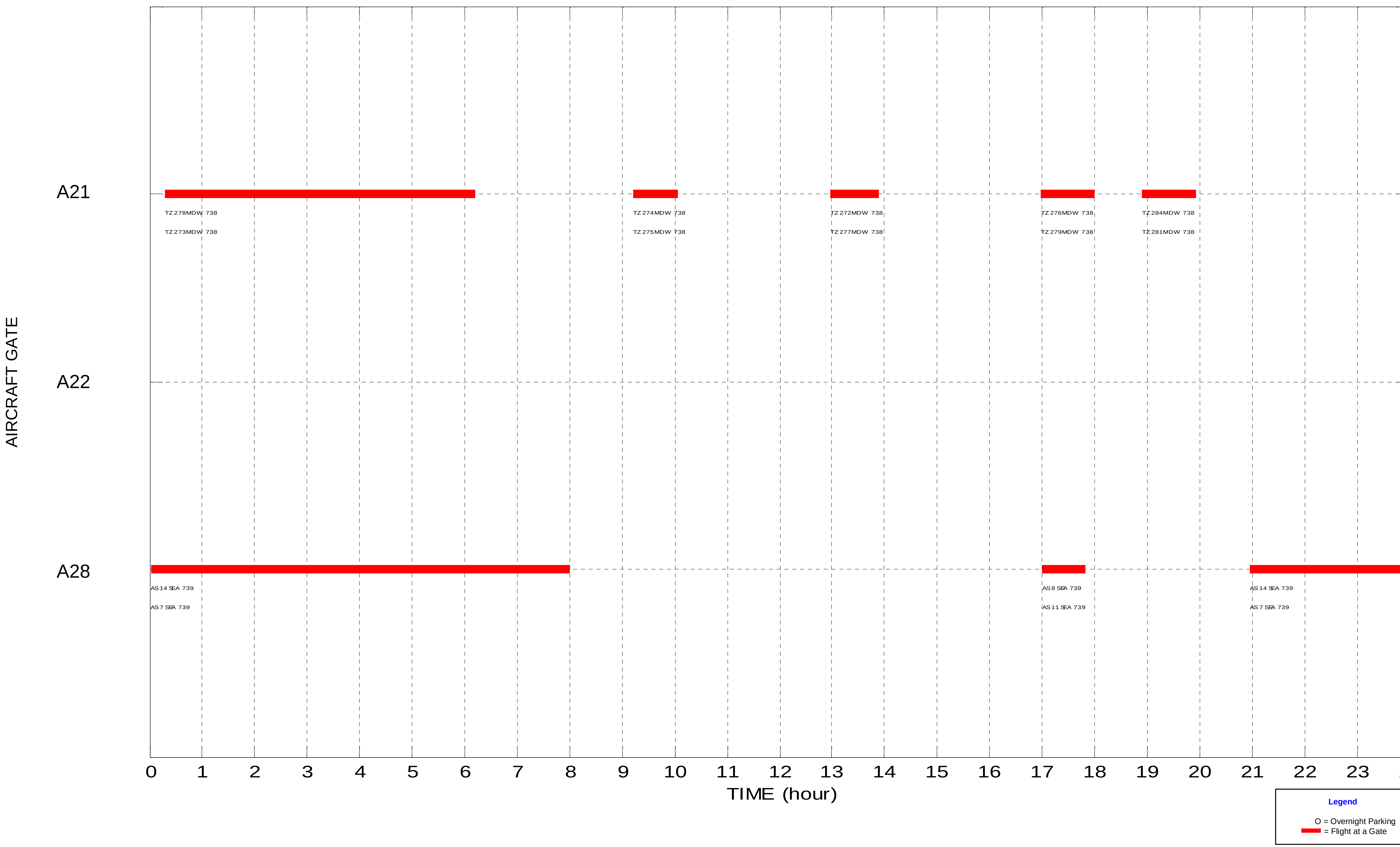


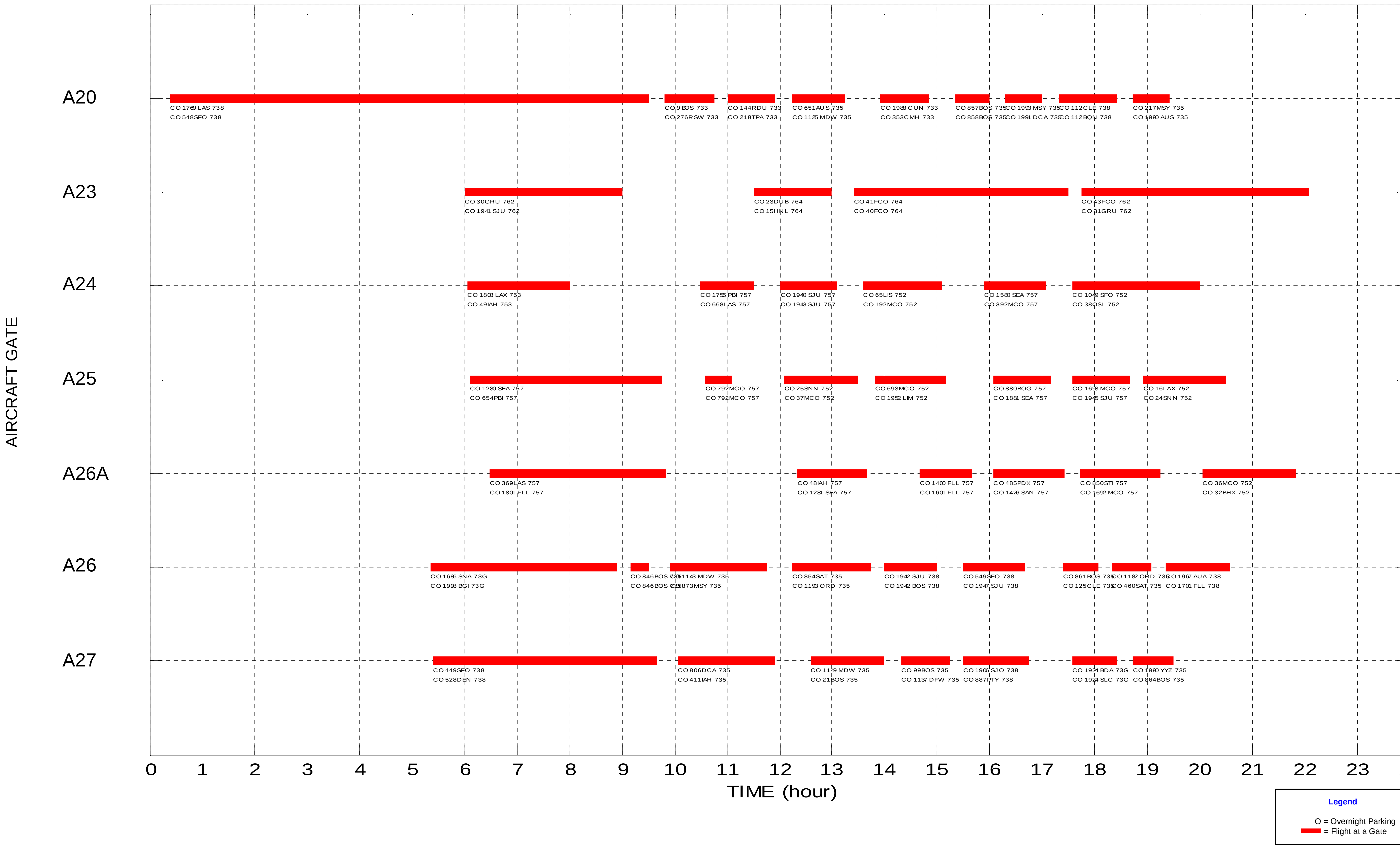
Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A2 - ATA AND ALASKA AIRLINES IN 2004

EXHIBIT 3

PB AVIATION



Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A2- CONTINENTAL AIRLINES IN 2004

EXHIBIT 10

PB AVIATION

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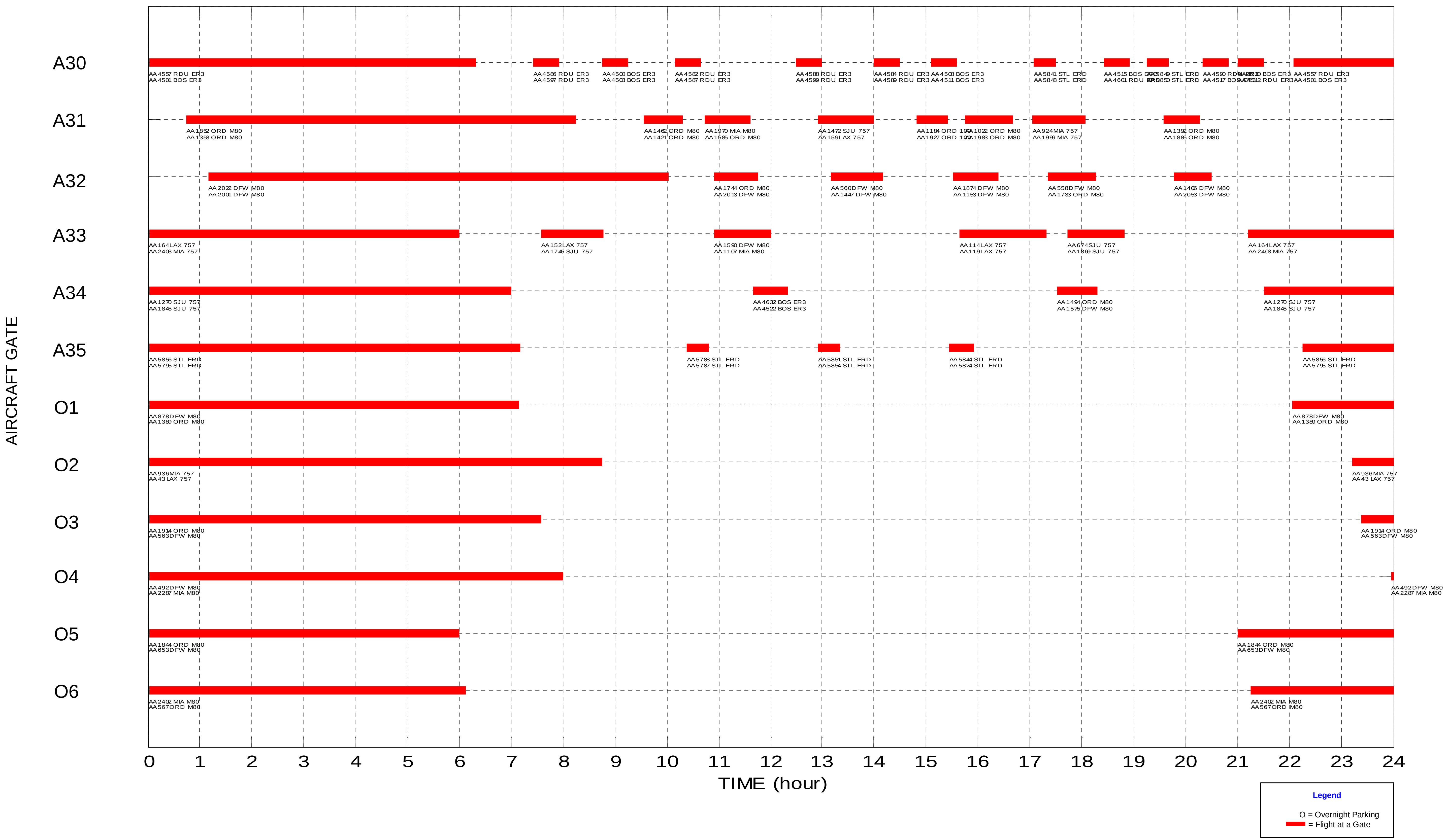


Newark International Airport

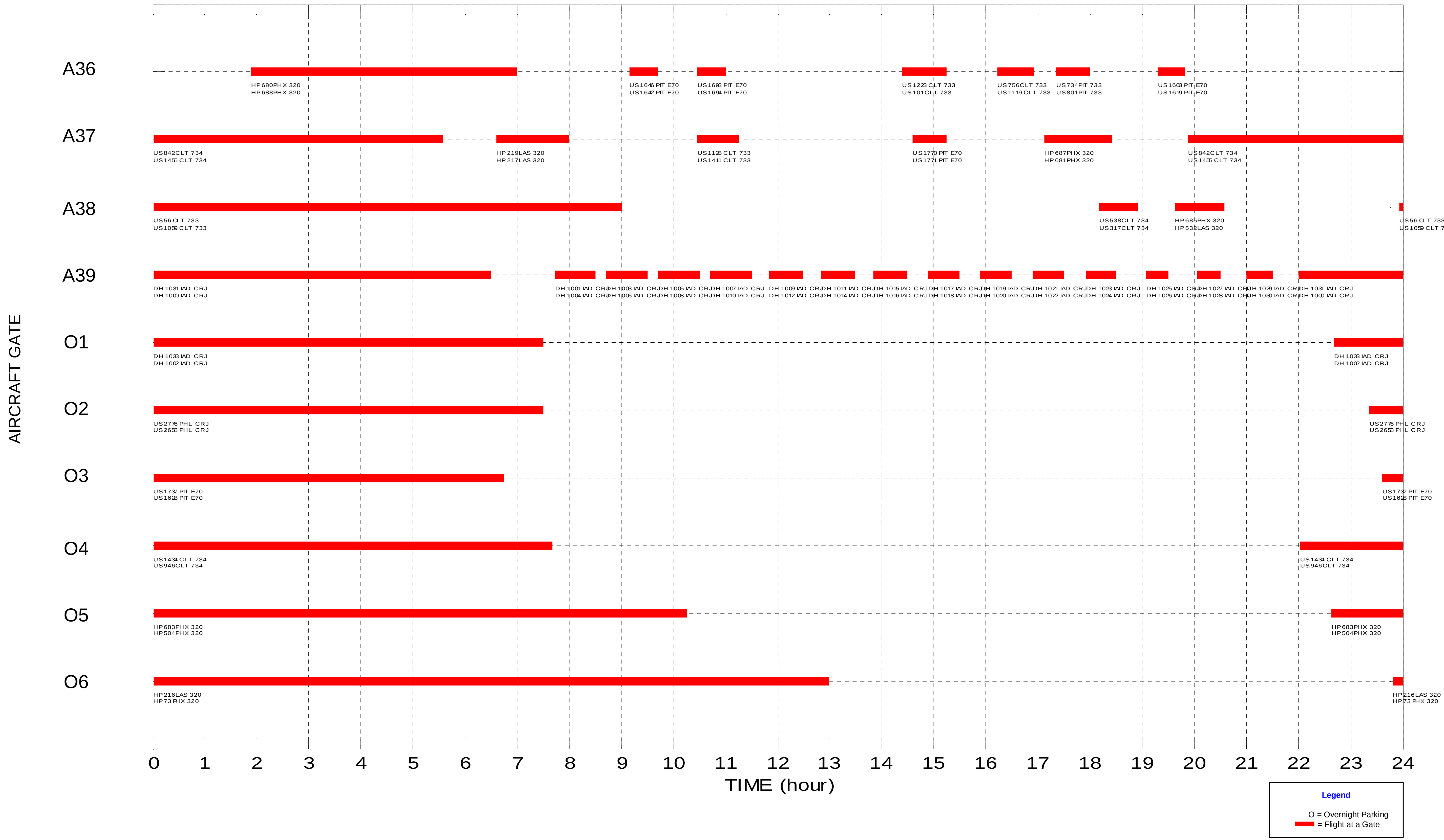
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A3- AMERICAN AIRLINES IN 2004

EXHIBIT 5

PB AVIATION

XX



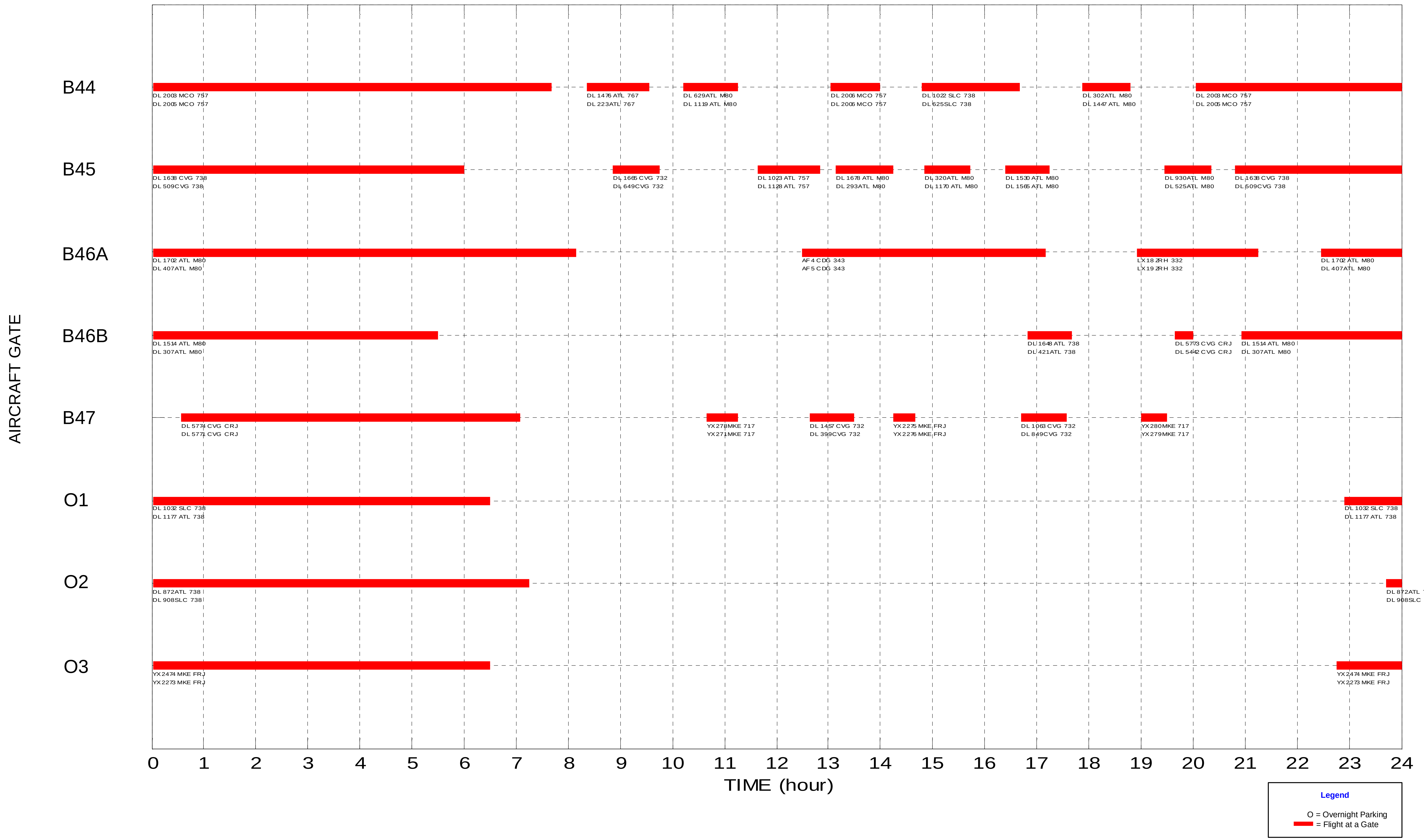
Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A3- US, HP, AND DH IN 2004

EXHIBIT 4

PB AVIATION



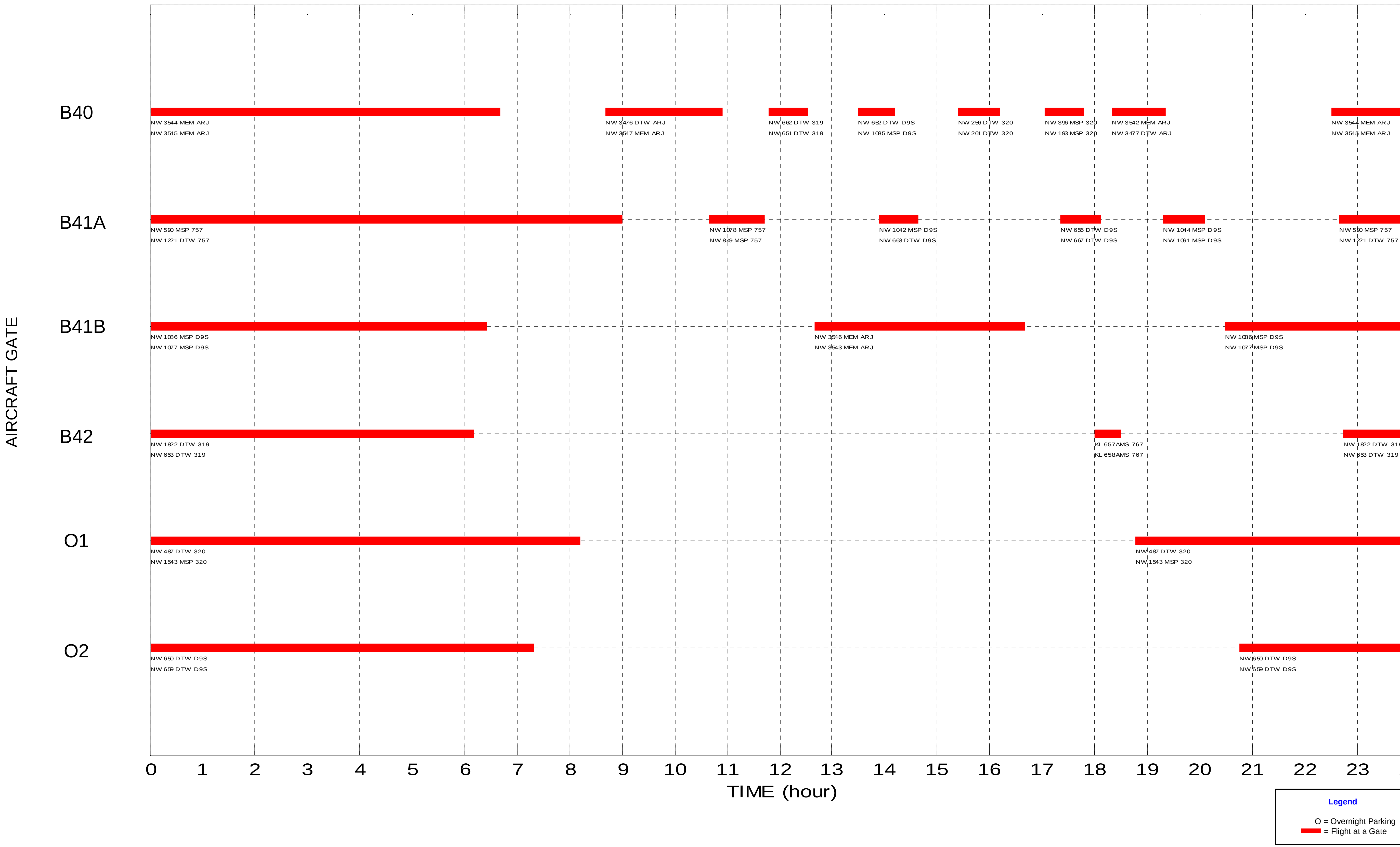
Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL B1- DL, YX, SONG IN 2004

EXHIBIT 7

PB AVIATION



Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL B1- NORTHWEST AIRLINES IN 2004

EXHIBIT 6

PB AVIATION

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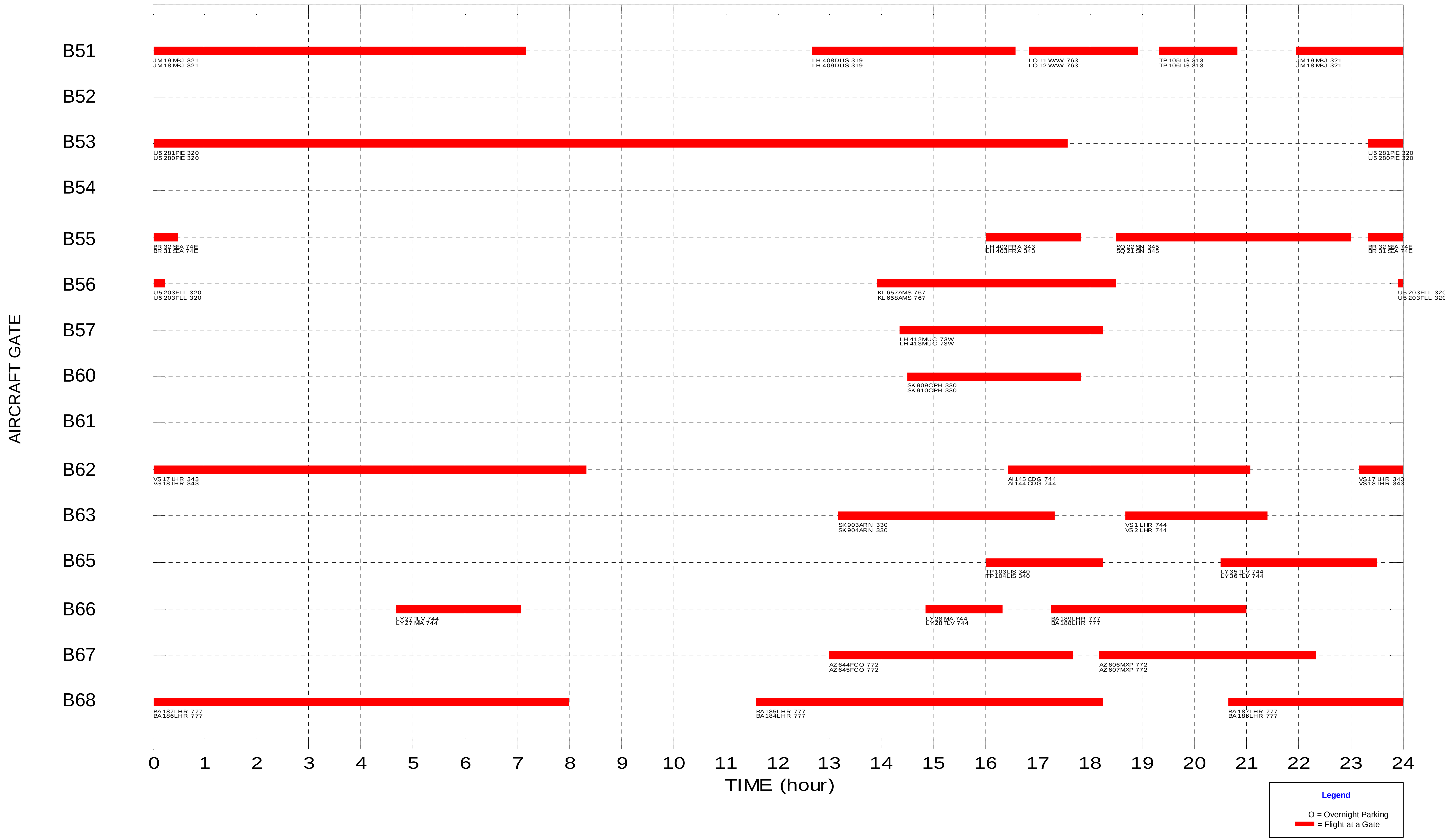


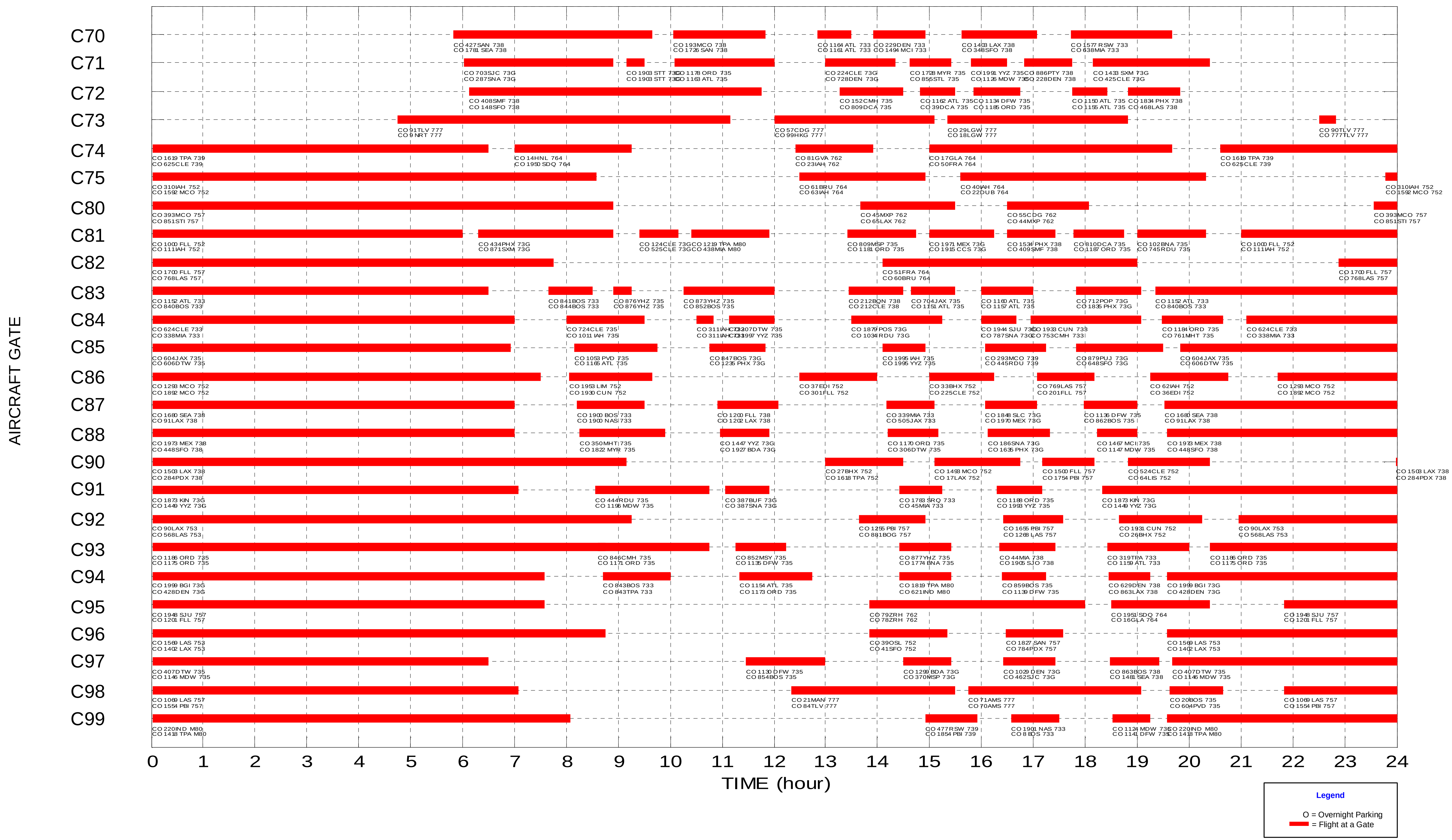
Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL B2 AND B3-COMMON USE IN 2004

EXHIBIT 8

PB AVIATION



Newark International Airport

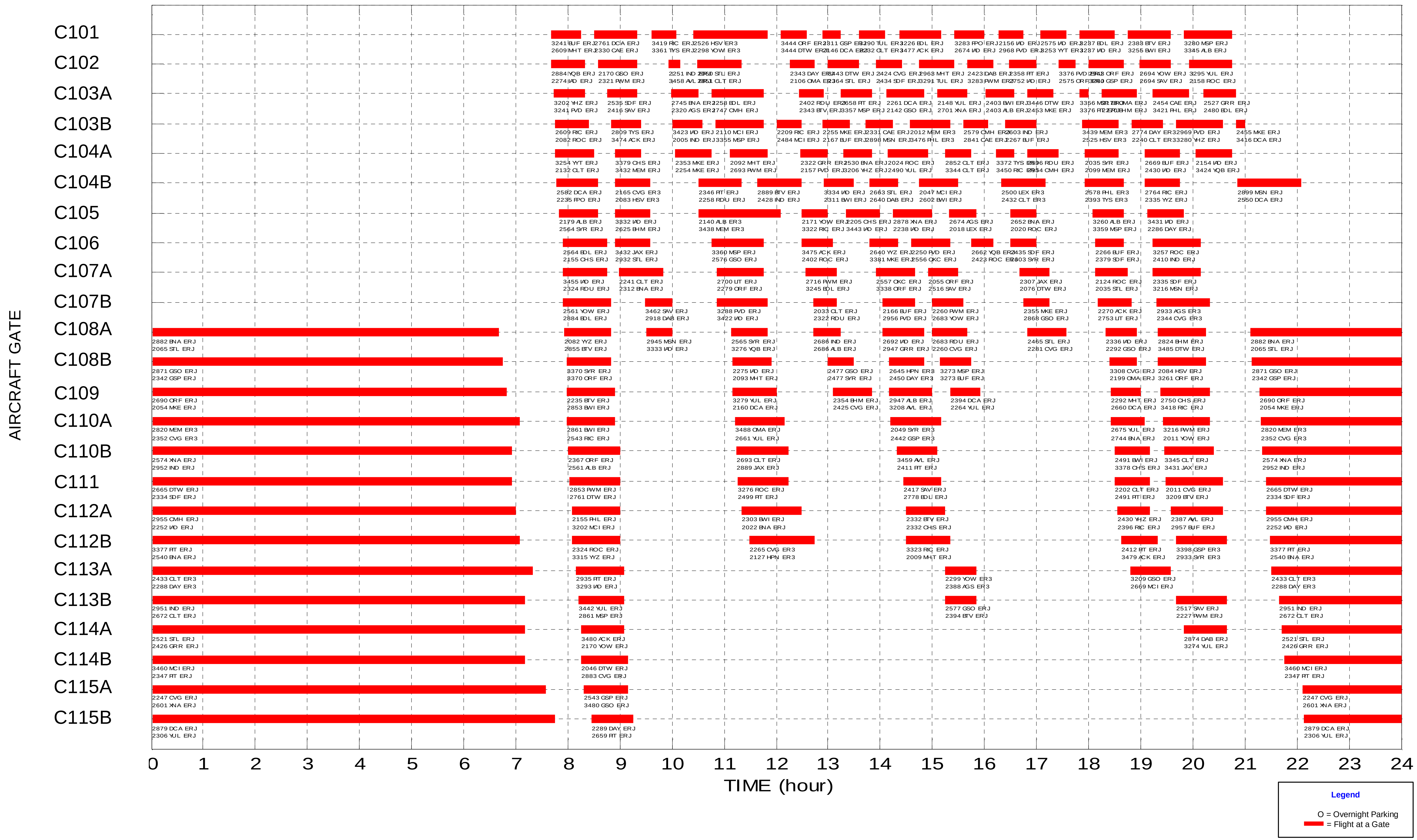
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL C1- CONTINENTAL AIRLINES IN 2004

EXHIBIT 11

XX

PB AVIATION



Newark International Airport

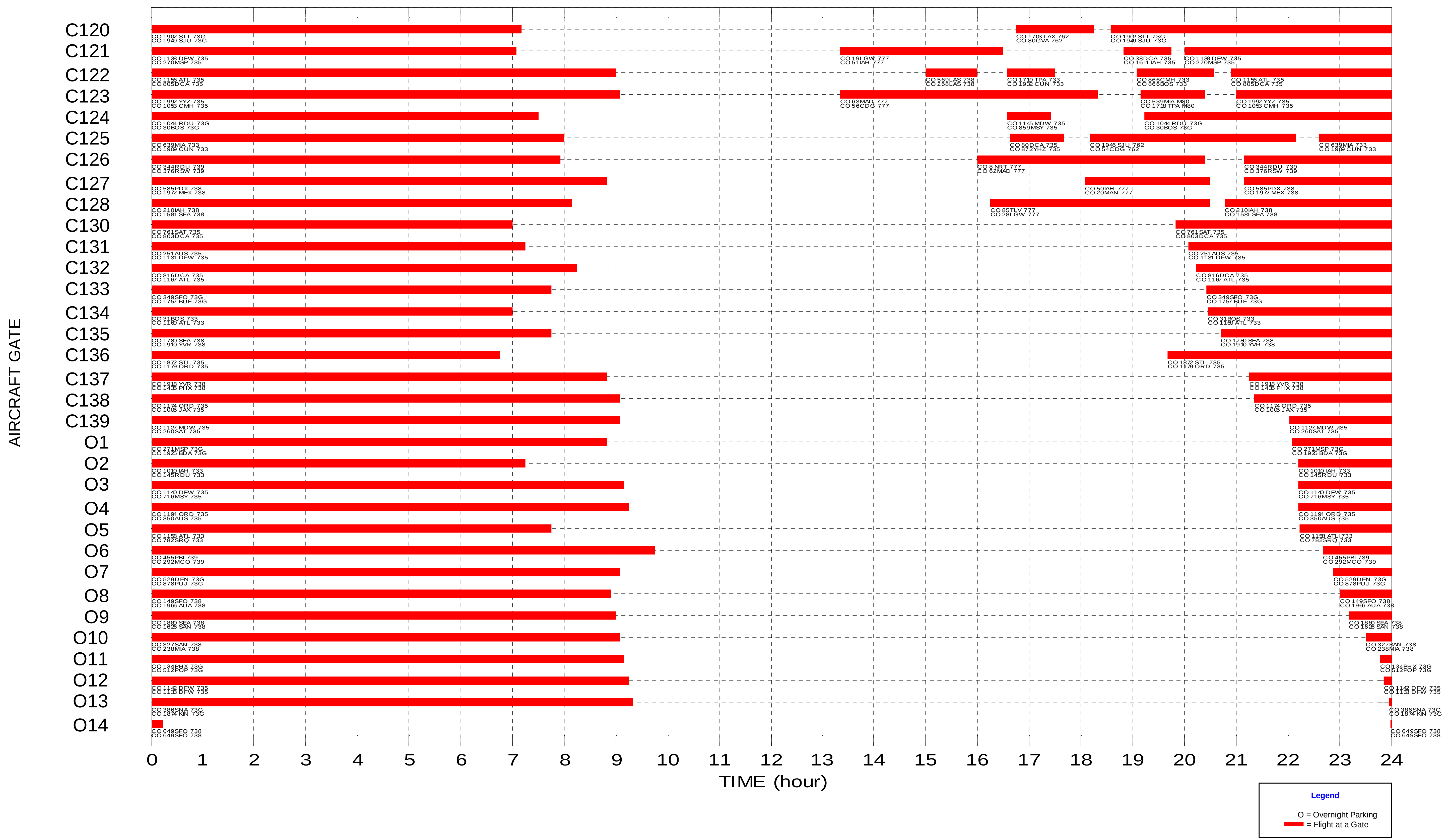
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL C2- CONTINENTAL EXPRESS IN 2004

EXHIBIT 9

PB AVIATION

XX



Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL C3- CONTINENTAL AIRLINES IN 2004

EXHIBIT 12

PB AVIATION

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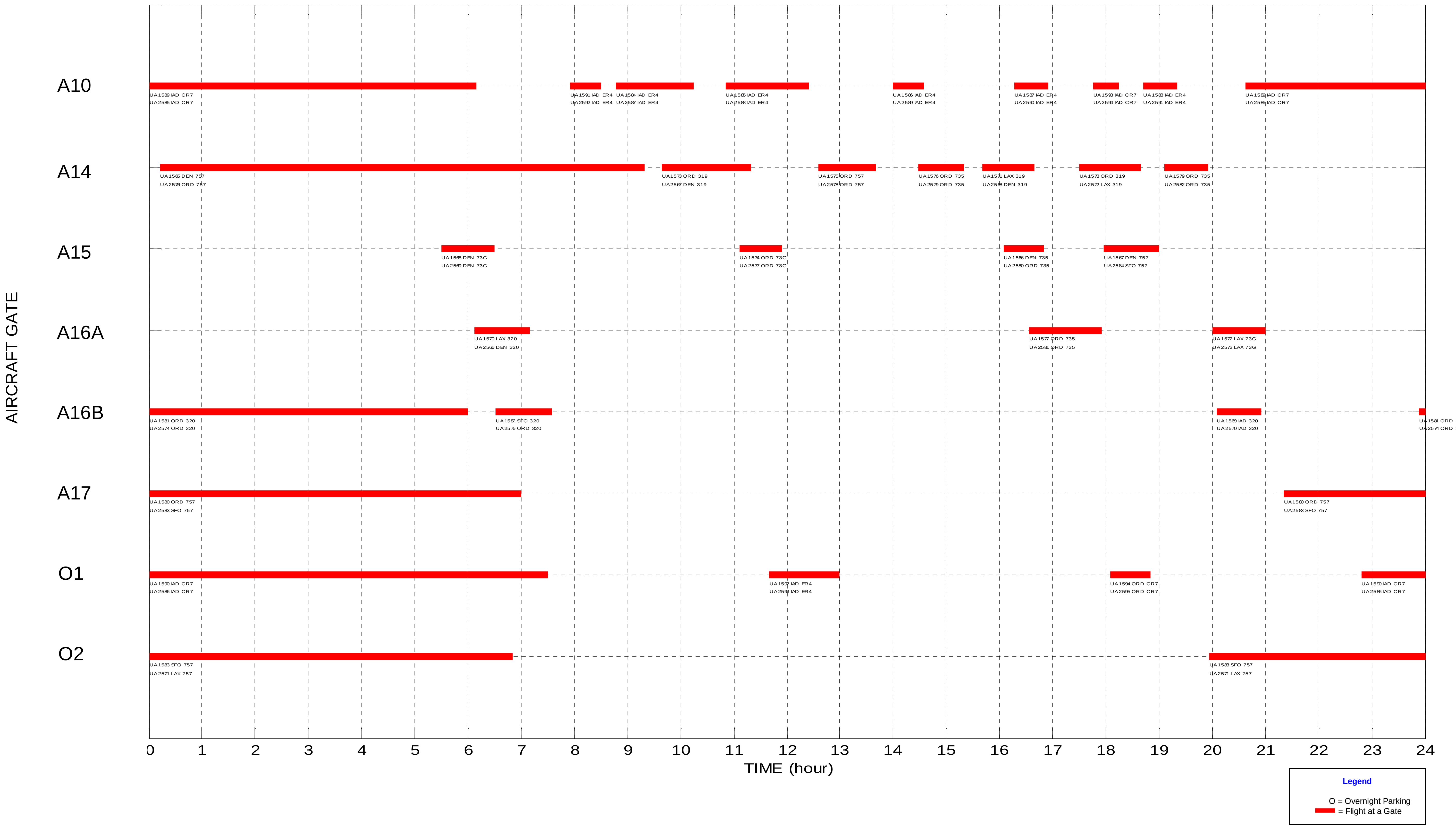

Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A1 - UNITED AIRLINES IN 2015

EXHIBIT 1

PB AVIATION

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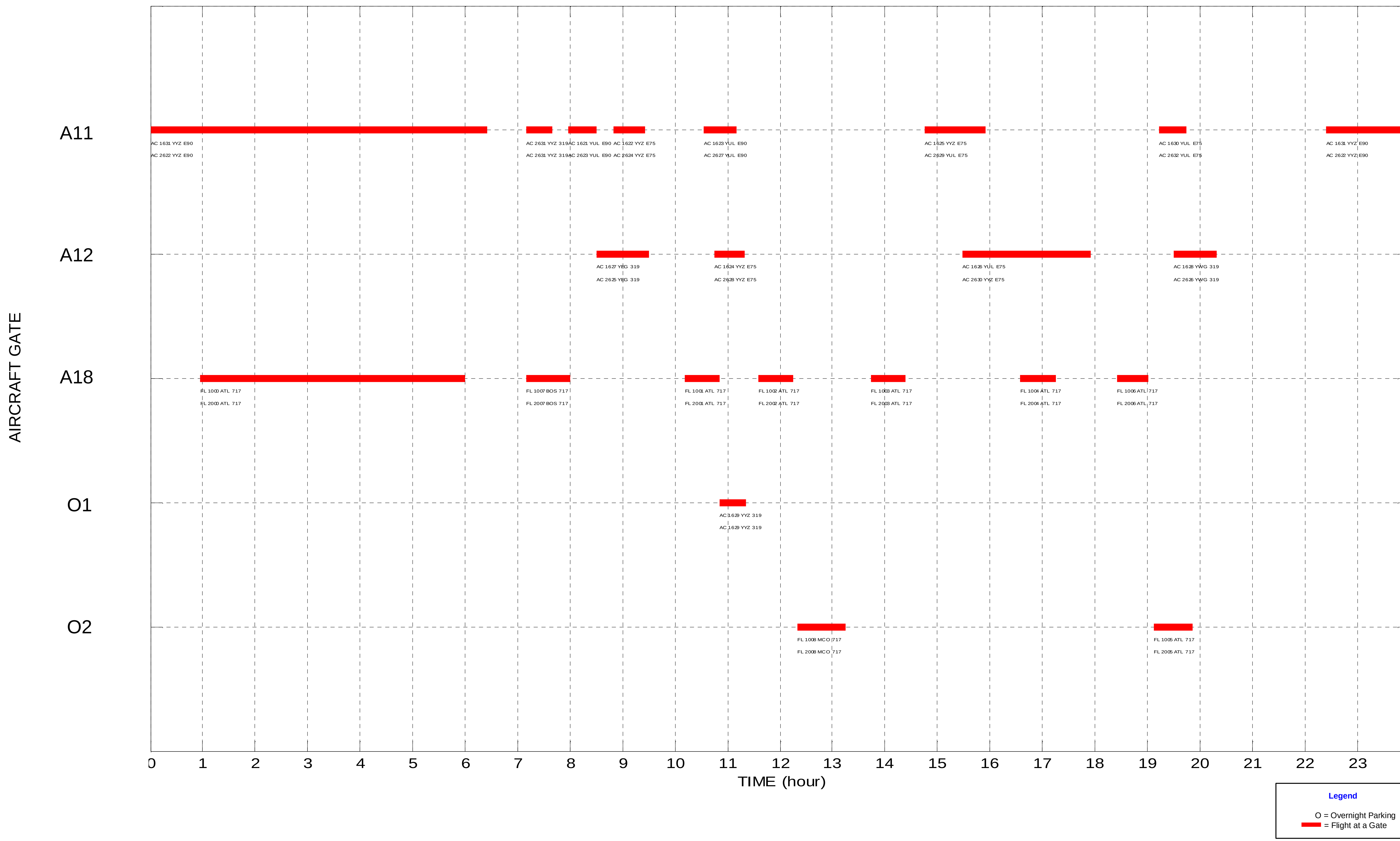


Newark International Airport

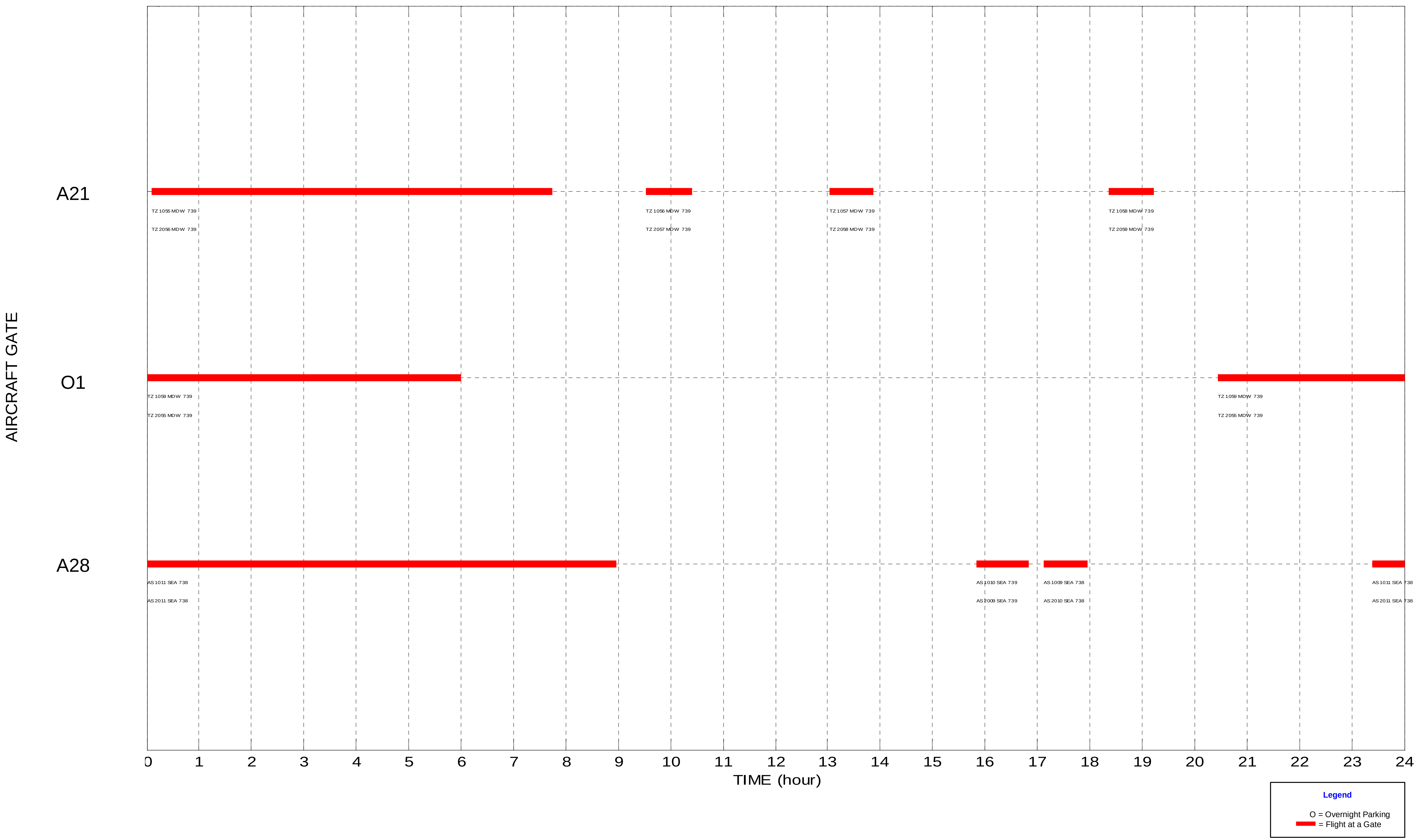
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A1 - AIR CANADA AND AIRTRAN IN 2015

EXHIBIT 2

PB AVIATION

XX



Newark International Airport

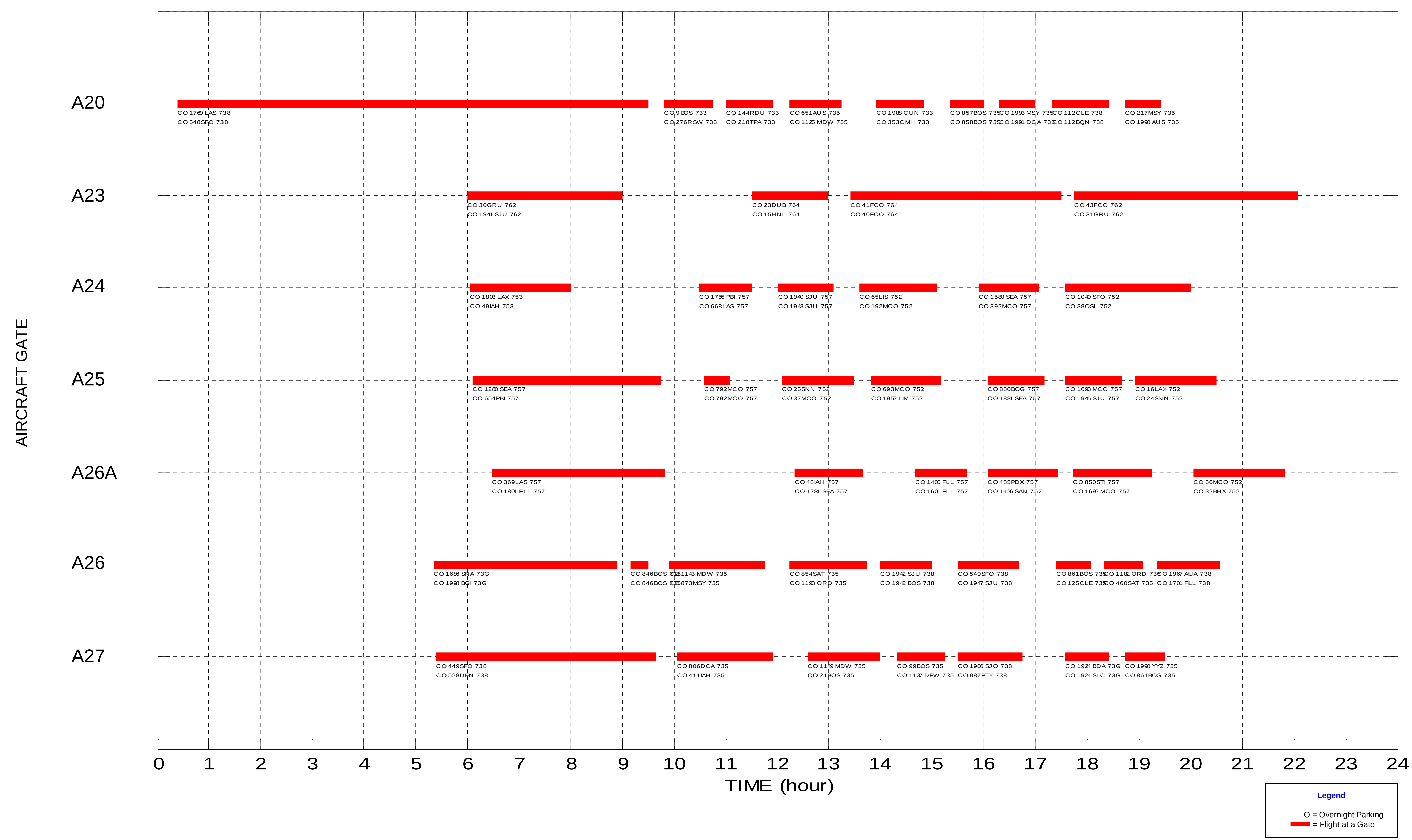
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A2 - ATA AND ALASKA AIRLINES IN 2015

EXHIBIT 3

PB AVIATION

XX



Newark International Airport

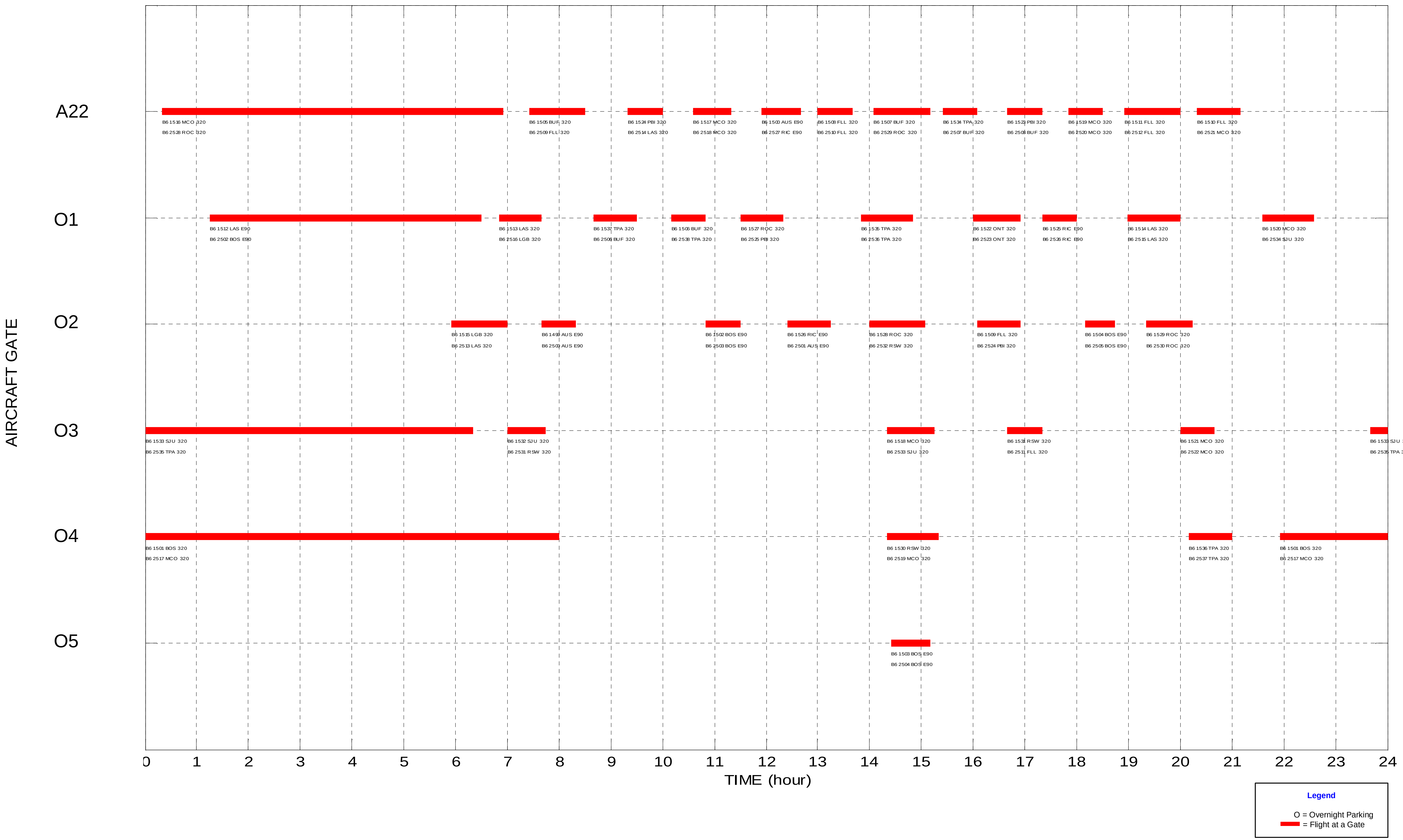
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A2- CONTINENTAL AIRLINES IN 2004

EXHIBIT 10

XX

PB AVIATION



Newark International Airport

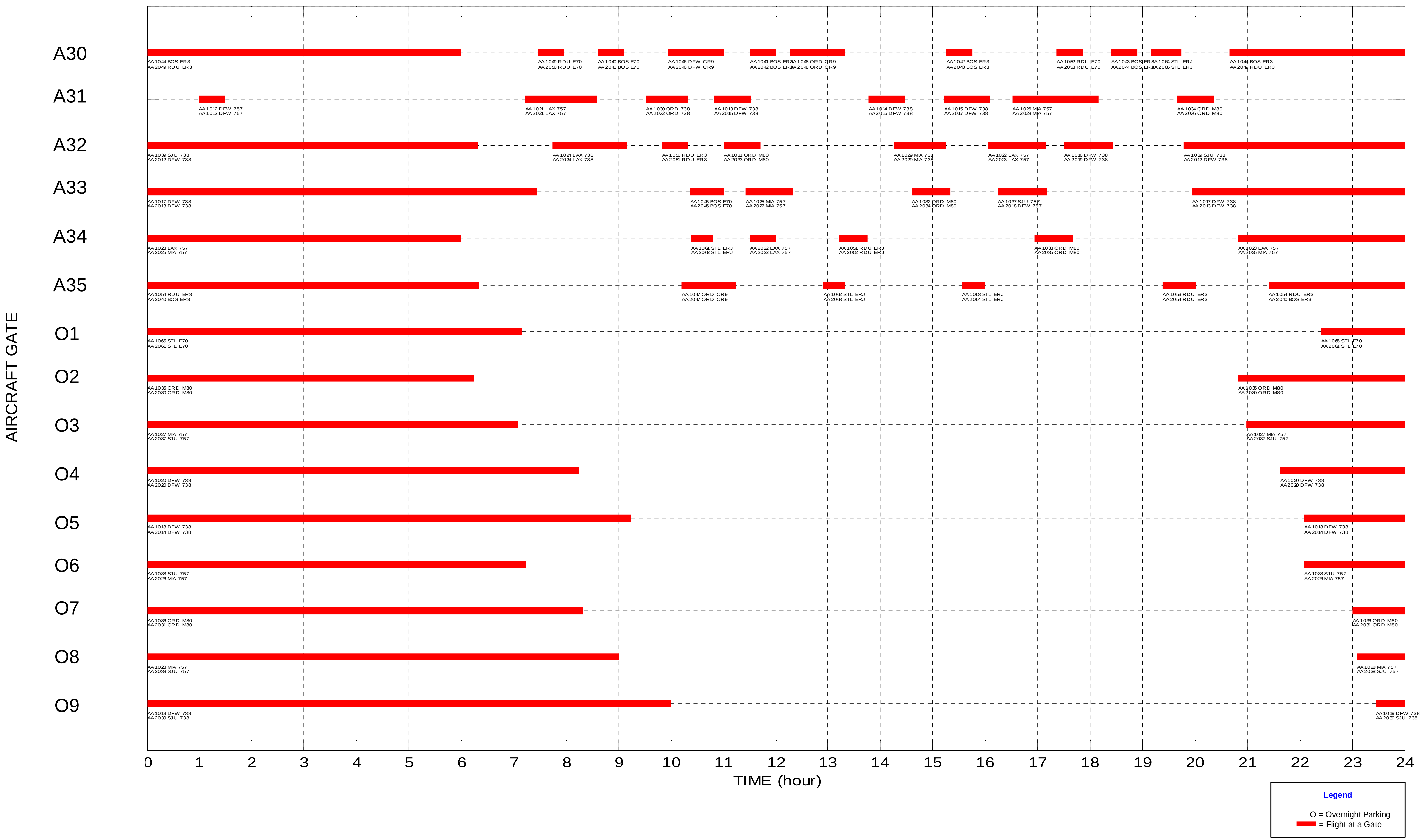
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A2 - JetBlue AIRLINES IN 2015

EXHIBIT 13

PB AVIATION

XX



Newark International Airport

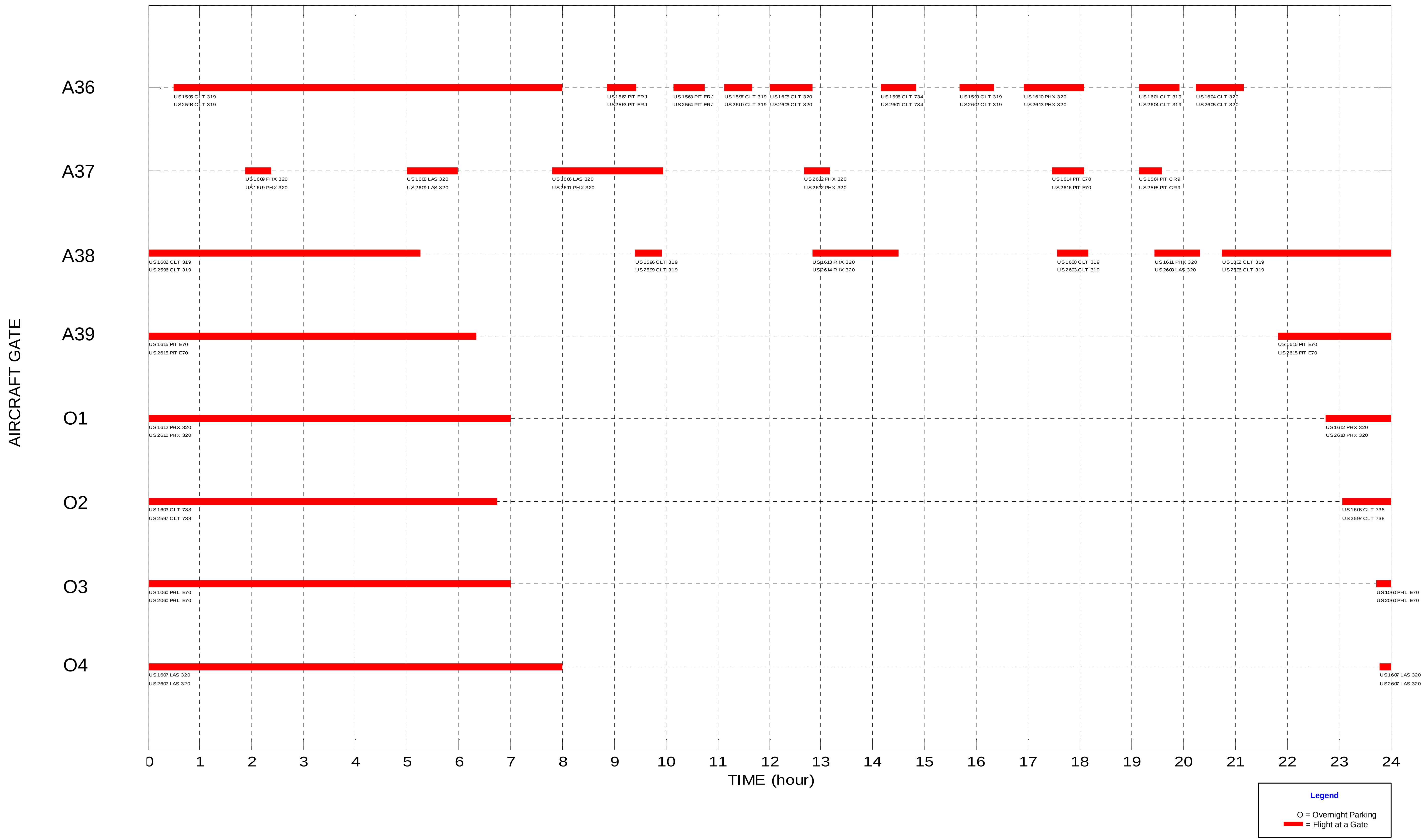
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A3- AMERICAN AIRLINES IN 2015

EXHIBIT 5

PB AVIATION

XX



Newark International Airport

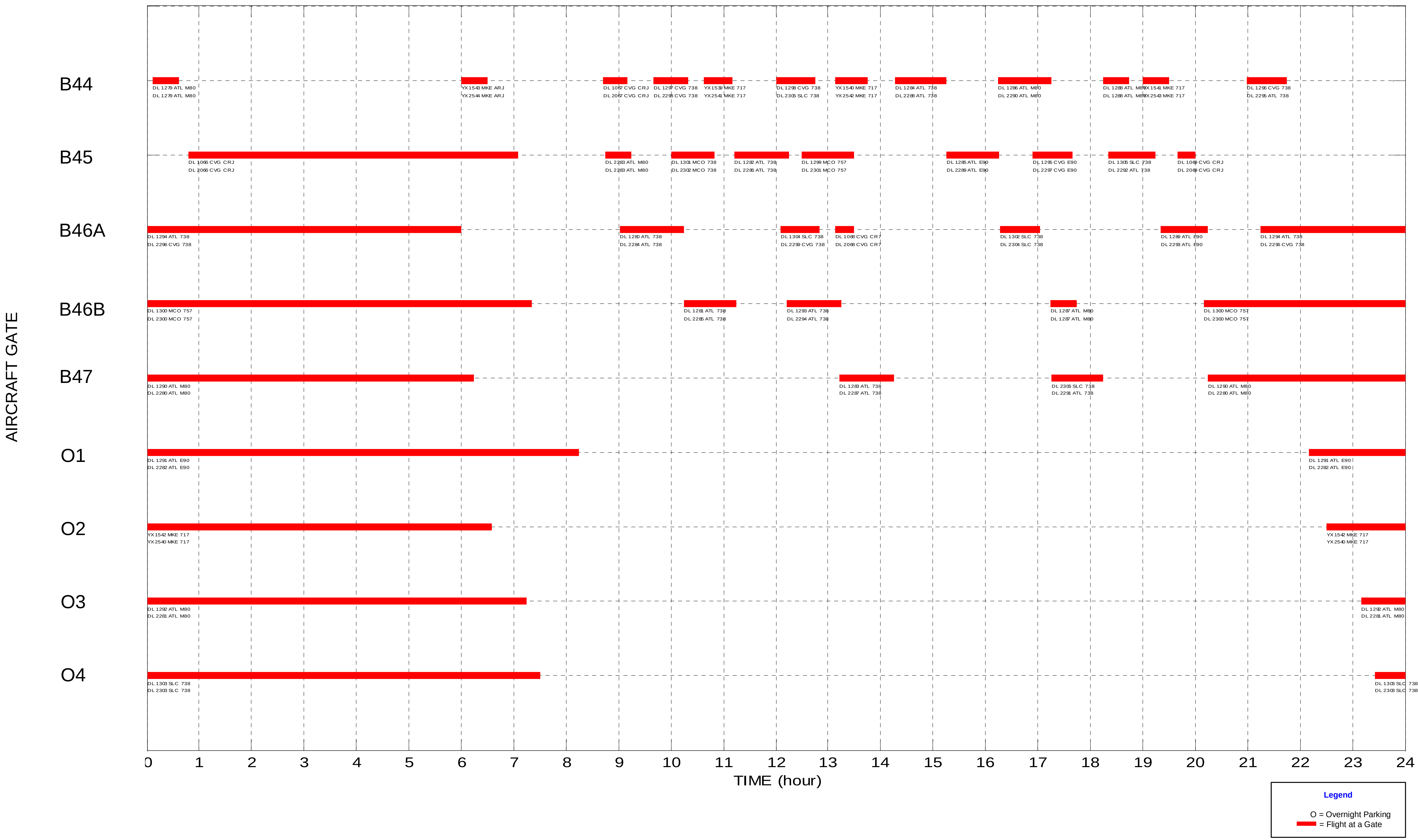
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL A3- US AIRWAYS IN 2015

EXHIBIT 4

XX

PB AVIATION



Newark International Airport

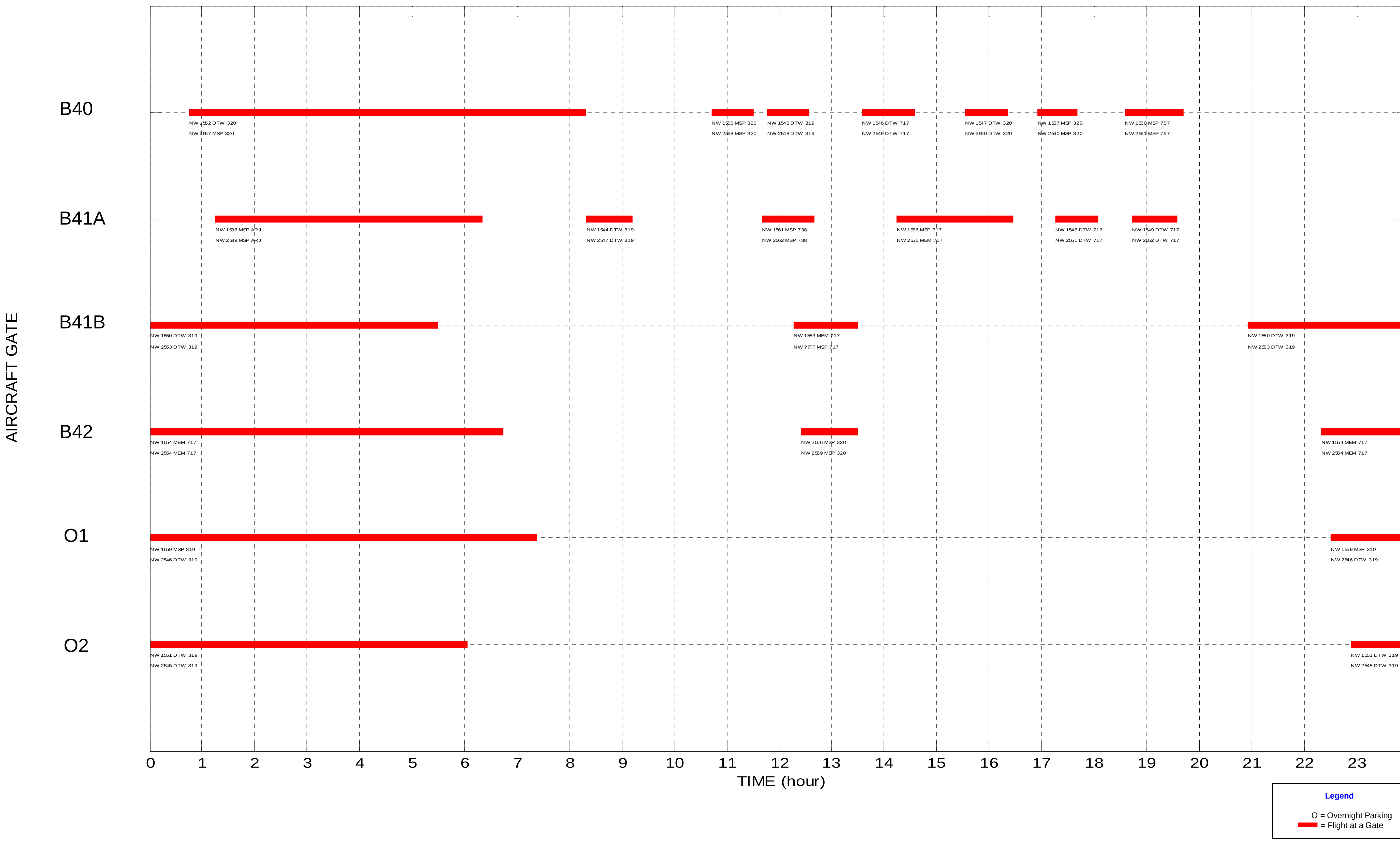
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL B1- DL, YX, SONG IN 2015

EXHIBIT 7

PB AVIATION

XX



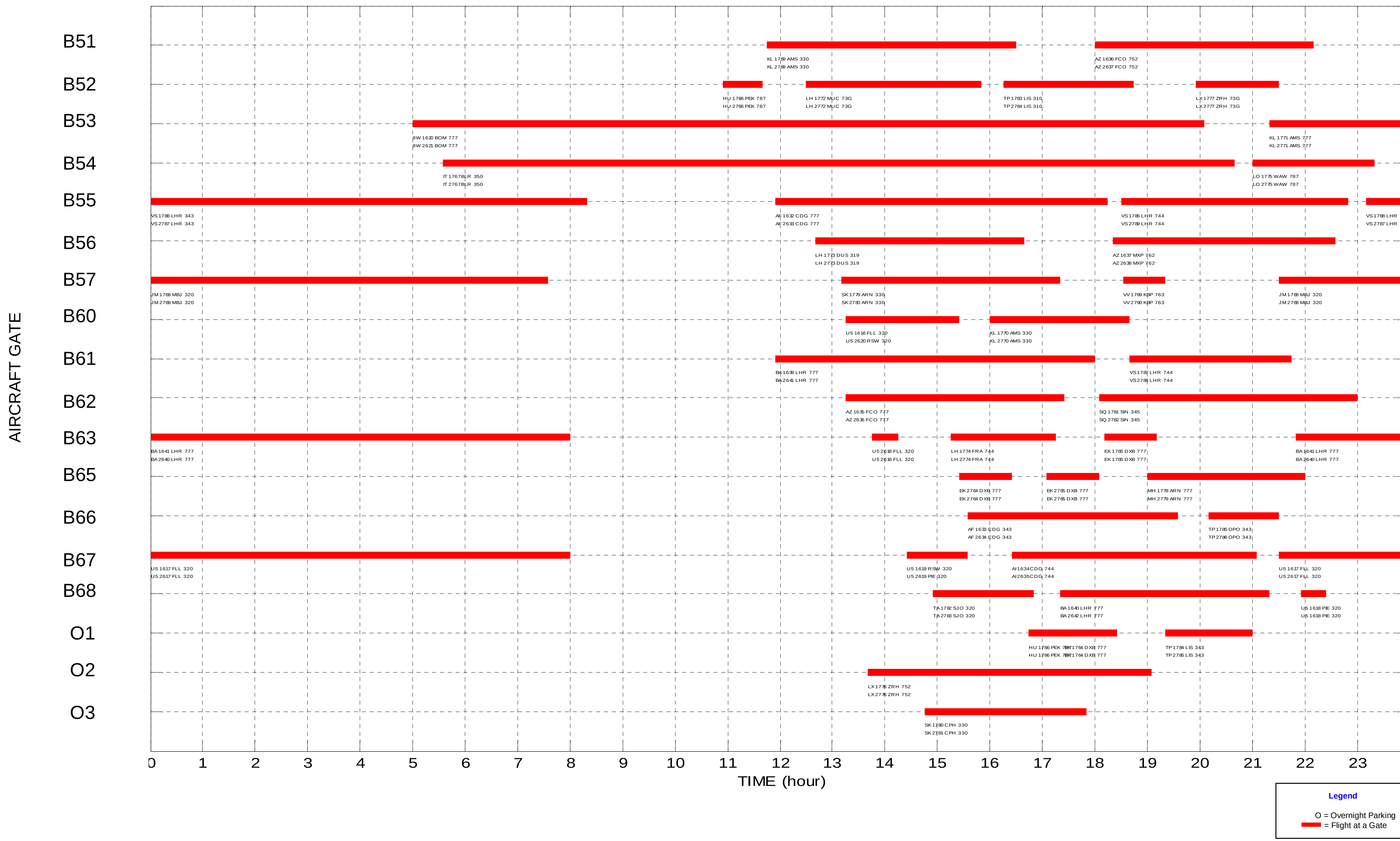
Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL B1- NORTHWEST AIRLINES IN 2015

EXHIBIT 6

PB AVIATION



Newark International Airport

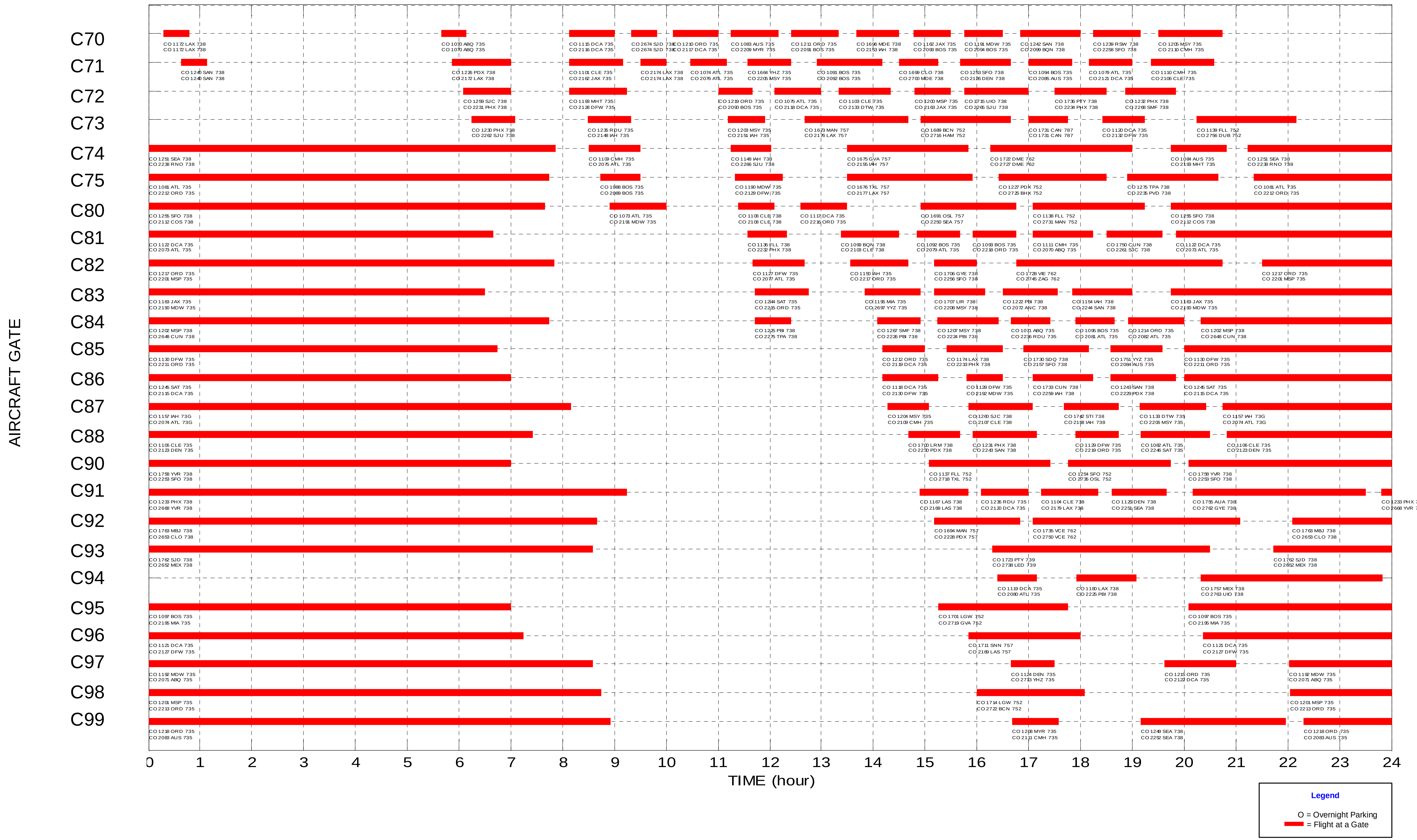
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL B2 AND B3-COMMON USE IN 2015

EXHIBIT 8

PB AVIATION

XX



Newark International Airport

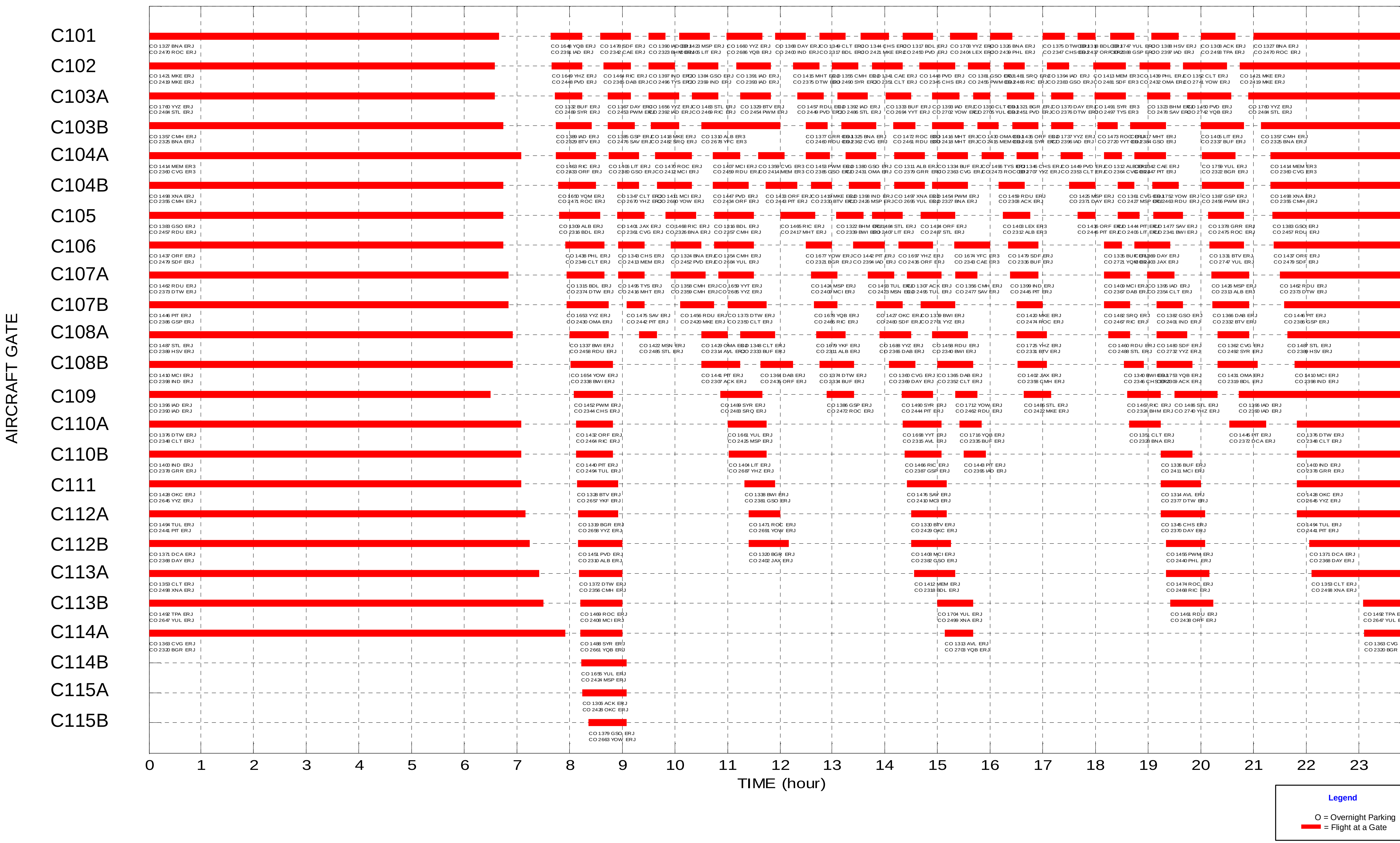
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL C1- CONTINENTAL AIRLINES IN 2015

EXHIBIT 11

PB AVIATION

XX



Newark International Airport

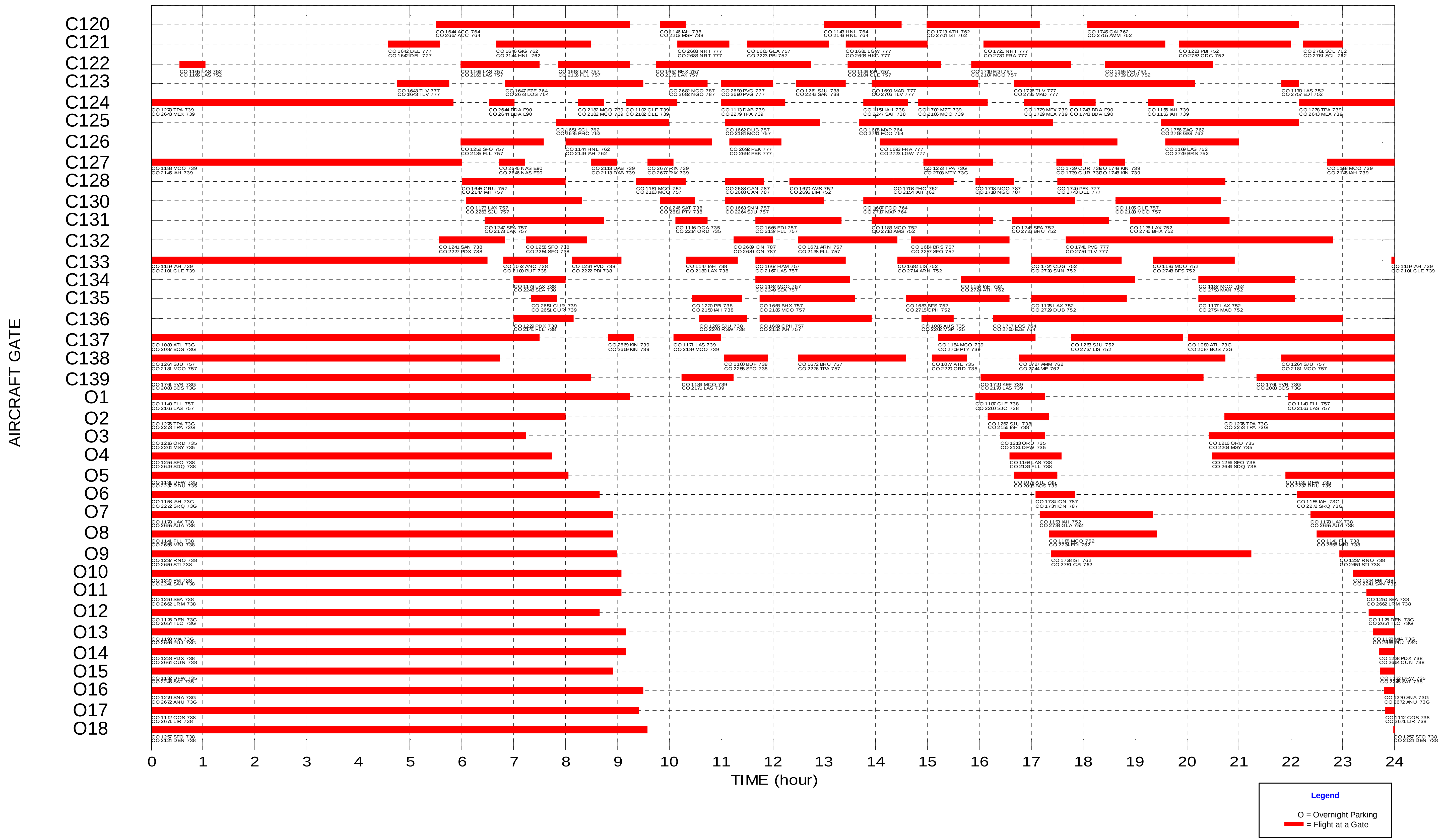
FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL C2-CONTINENTAL EXPRESS IN 2004

EXHIBIT 9

XX

PB AVIATION



Newark International Airport

FAA REGIONAL AIR SERVICE DEMAND STUDY

AIRCRAFT RAMP CHART AT TERMINAL C3- CONTINENTAL AIRLINES IN 2015

EXHIBIT 12

PB AVIATION

XX