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NEW YORK AIRPORTS DATA PACKAGE NUMBER 1, JOHN F. KENNEDY INTERN--ETC(U)
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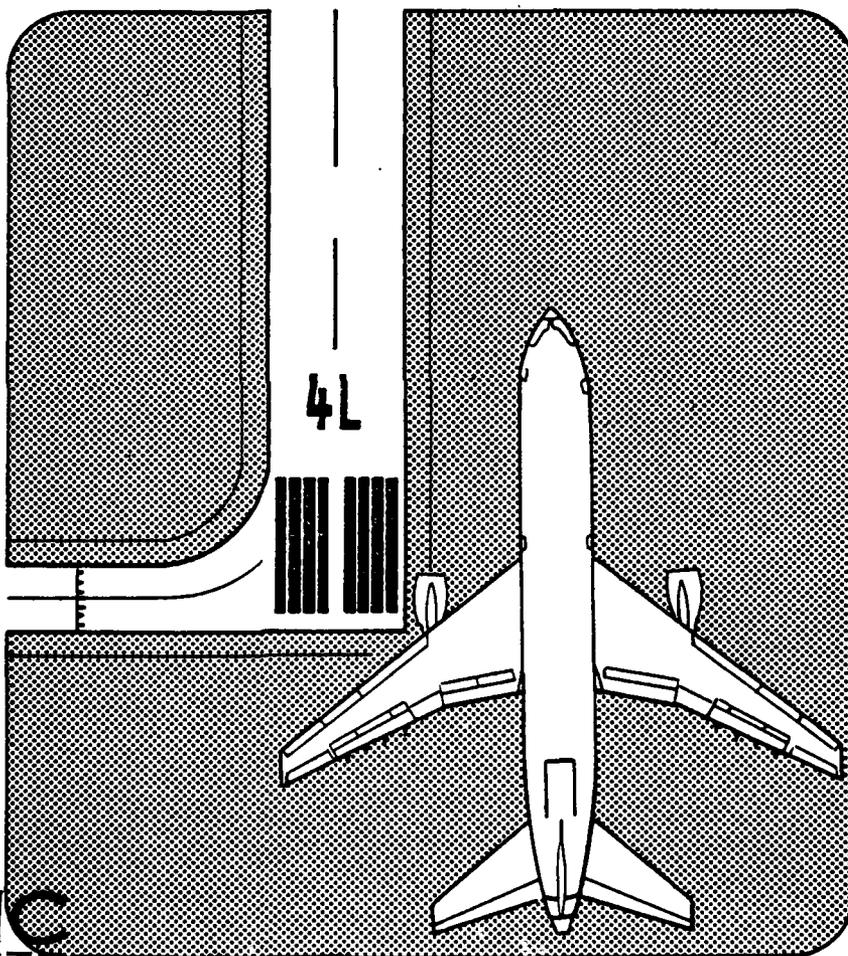
NEW YORK AIRPORTS

DATA PACKAGE NO. 1,

JOHN F. KENNEDY INTERNATIONAL AIRPORT,
LA GUARDIA AIRPORT.

AIRPORT IMPROVEMENT
TASK FORCE DELAY STUDIES

AD A 099864



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prepared for
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
under contract

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Peat, Marwick, Mitchell & Co.

JULY 1978

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P. O. BOX 8007

SAN FRANCISCO INTERNATIONAL AIRPORT

SAN FRANCISCO, CALIFORNIA 94128

Telephone: (415) 347-9521

July 6, 1978

Mr. Ray Fowler, AEM-100
 Federal Aviation Administration
 800 Independence Avenue, S.W.
 Washington, D.C. 20591

Re: Input Data for New York Simulation Model Calibration
 and Annual Delay Baseline Experiment

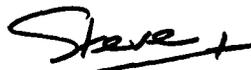
Dear Ray:

Enclosed are preliminary data packages for use during the
 second Task Force meeting on July 11, 1978:

- Attachments A and B contain the preliminary calibration data package and the preliminary annual delay baseline data package, respectively, for John F. Kennedy International Airport.
- Attachments C and D contain the preliminary calibration data package and the preliminary annual delay baseline data package, respectively, for LaGuardia Airport.

These attachments should be reviewed, revised, and approved
 by the New York Task Force prior to use in model runs.

Sincerely,



Stephen L. M. Hockaday
 Manager

SLMH/sq
 Enclosures

cc: Mr. J. R. Dupree, ALG-312
 Mr. C. Caifa, AEA-4
 (both w/encls)

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Attachment A

PRELIMINARY CALIBRATION DATA PACKAGE

John F. Kennedy International Airport

New York
Airport Improvement Task Force Delay Studies

Peat, Marwick, Mitchell & Co.
San Francisco, California

July 1978

INPUT DATAA. LOGISTICS

1. Title: John F. Kennedy International Airport Airfield
Simulation Model Calibration Run
2. Random Number Seeds: 2017, 3069, 4235, 5873, 6981,
7137, 8099, 9355, 0123, 1985.
3. Start and Finish Times: May 1, 1978: 20:00-23:00 GMT.
4. Print Options: Detailed run for one random number seed.
Summary run for ten random number seeds.
5. Airline Names:

<u>Name</u>	<u>Code</u>
Air Freight	AF
Air Taxi	AT
Allegheny	AL
American	AA
Braniff	BN
Delta	DL
Eastern	EA
Foreign International	FI
National	NA
Northwest	NW
Pan American	PA
Trans World	TW
United	UA
6. Processing Options: First run to check model input.
Other runs in COMPUTE mode.
7. Truncation Limits: \pm 3 standard deviations.
8. Time Switch: Not applicable.

B. AIRFIELD PHYSICAL CHARACTERISTICS

9. Airfield Network: See Figure 1.
10. Number of Runways: 3.
11. Runway Identification: 31L, 31R, 32.
12. Departure Runway End Links: 109, 167, 158.

13. Runway Crossing Links: 163, 180, 242, 243.
14. Exit Taxiway Location: 157, 176, 191, 192, 193, 194, 195, 196, 197, 238, 243.
15. Holding Areas: On Taxiway Z between Runways 4L-22R and 4R-22L; area No. 10.
16. Airline Gates: Not applicable.
17. General Aviation Basing Areas: West of terminal area between Taxiways O and Q; area No. 13.

C. ATC PROCEDURES

18. Aircraft Separations:

Arrival-Arrival Separation (n.m.)

1. VFR: Accounting to Report No. FAA-EM-78-8.

		<u>Trail Aircraft Class</u>			
		<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
Lead	A	1.9	1.9	1.9	1.9
Aircraft	B	1.9	1.9	1.9	1.9
Class	C	2.7	2.7	1.9	1.9
	D	4.5	4.5	3.6	2.7

2. IFR: Calibration to be done includes VFR only.

Departure-Departure Separations (seconds)

1. VFR

		<u>Trail Aircraft Class</u>			
		<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
Lead	A	35	35	45	50
Aircraft	B	35	35	45	50
Class	C	50	50	60	60
	D	120	120	120	90

2. IFR

		<u>Trail Aircraft Class</u>			
		<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
Lead	A	60	60	60	60
Aircraft	B	60	60	60	60
Class	C	60	60	60	60
	D	120	120	120	90

Departure-Arrival Separation (n.m.): To be based on reduced field data or departure runway occupancy times.

Arrival-Departure Separation (seconds): To be based on reduced field data or arrival runway occupancy times.

19. Route Data: See Figure 2.

20. Two-Way Path Data: 158, 159, 160, 161, 162, 163, 164, 165, 166, 184, 202, 220, 275.

21. Common Approach Paths:

<u>Aircraft Class</u>	<u>Length of Common Approach Path</u>
A	6.0
B	6.0
C	6.0
D	6.0

22. Vectoring Delays:

This input allocates delays among vectoring and holding. Model input values will be used that hold arrival aircraft if delays to arrival aircraft exceed 10 minutes.

23. Departure Runway Queue Control:

Aircraft are assigned departure runways to preclude airspace crossovers, not to balance departure queues.

24. Gate Hold Control:

Aircraft are held at gates when departure queue at runway is 10 or more, except when gate holds would cause gate congestion.

25. Departure Airspace Constraints:

Aircraft are not held at gates due to departure airspace constraints.

26. Inter-Arrival Gap:

With this runway use, arrival aircraft are delayed in the arrival airspace when departure delays exceed 10 minutes.

27. Runway Crossing Delay Control:

Arrival and departure runway operations are only interrupted for a taxiing aircraft to cross an active runway when the taxiing aircraft is delayed by 10 minutes or more.

D. AIRCRAFT OPERATIONAL CHARACTERISTICS28. Exit Taxiway Utilization:

		Exit Utilization (Percent)				
		<u>E</u>	<u>D</u>	<u>B</u>	<u>A</u>	<u>W</u>
<u>Class</u>						
Runway 31R	A	100	0	0	0	0
	B	61	39	0	0	0
	C	0	5	59	36	0
	D	0	4	37	53	6

		Exit Utilization (Percent)			
		<u>L</u>	<u>M</u>	<u>N</u>	<u>PA</u>
<u>Class</u>					
Runway 31L	A	100	0	0	0
	B	17	33	50	0
	C	7	33	57	3
	D	0	16	47	37

		Exit Utilization (Percent)	
		<u>Y</u>	<u>E</u>
<u>Class</u>			
Runway 32	A	10	90
	B	0	100
	C	0	0
	D	0	0

29. Arrival Runway Occupancy Times:

		Runway Occupancy Times (Seconds)				
		<u>E</u>	<u>D</u>	<u>B</u>	<u>A</u>	<u>W</u>
Runway 31R	A	44	-	-	-	-
	B	40	51	-	-	-
	C	-	45	48	61	-
	D	-	48	55	65	72

		Runway Occupancy Times (Seconds)			
		<u>L</u>	<u>M</u>	<u>N</u>	<u>PA</u>
Runway 31L	A	35	-	-	-
	B	33	45	54	-
	C	32	37	50	59
	D	-	42	50	61

		Runway Occupancy Times (Seconds)	
		<u>Y</u>	<u>E</u>
Runway 32	A	25	40
	B	-	35
	C	-	-
	D	-	-

30. Touch & Go Occupancy Times: Not applicable.31. Departure Runway Occupancy Times:

<u>Aircraft Class</u>	<u>Runway Occupancy Time (seconds)</u>	
	<u>Mean</u>	<u>Standard Deviation</u>
A	34	4
B	34	4
C	39	4
D	39	4

32. Taxi Speeds: To be based on reduced field data.33. Approach Speeds:

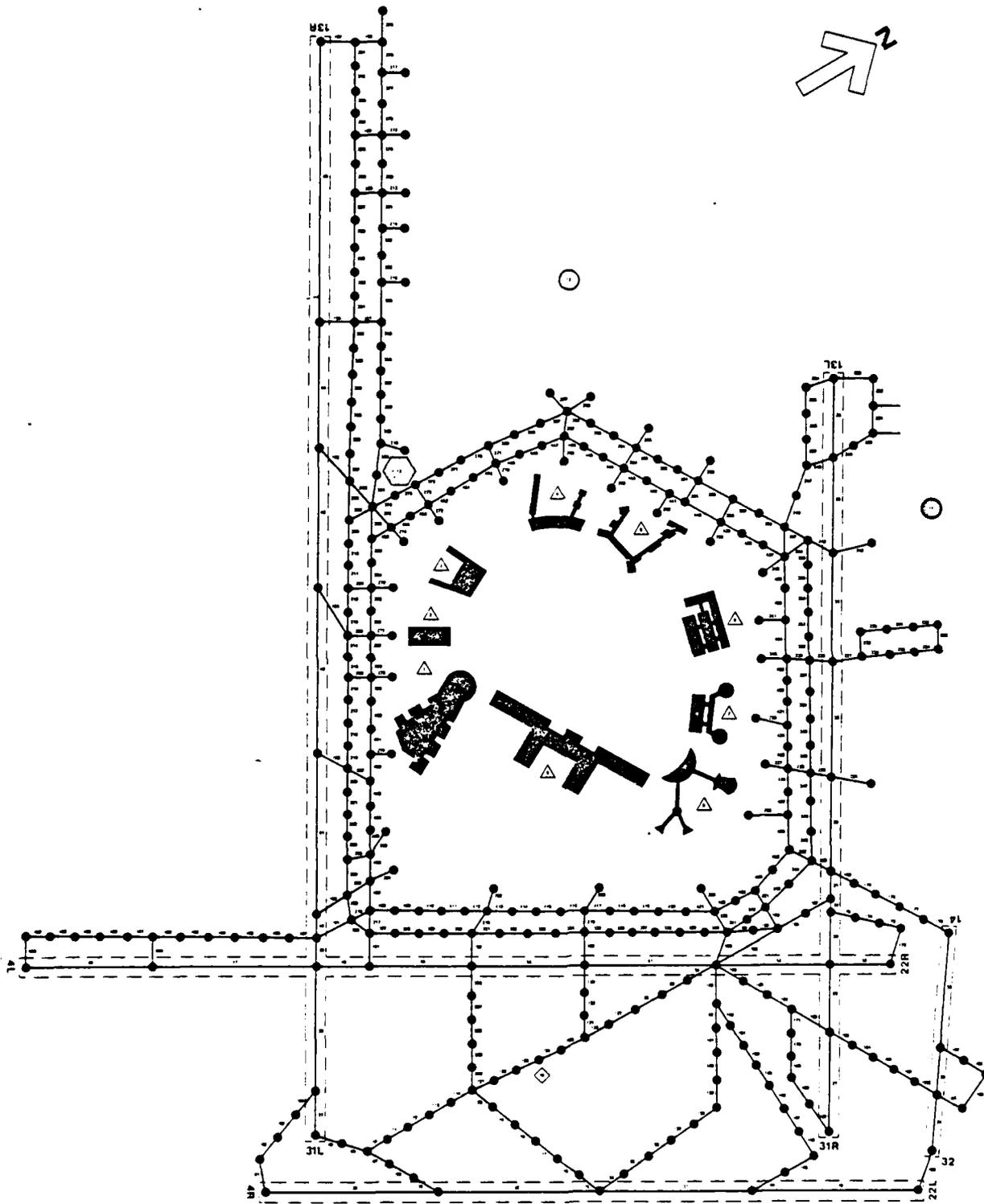
<u>Aircraft Class</u>	<u>Approach Speed (knots)</u>	
	<u>Mean</u>	<u>Standard Deviation</u>
A	120	10
B	120	10
C	130	10
D	140	10

34. Gate Service Times: Not applicable to calibration.
35. Airspace Travel Times: To be based on reduced field data.
36. Runway Crossing Times: To be based on reduced field data (20 seconds).
37. Lateness Distribution: Not applicable to calibration.
38. Demand: To be based on reduced field data.

OUTPUT DATA

- A. FLOW RATES: To be based on reduced field data.
- B. DELAYS: To be based on reduced field data.
- C. TRAVEL TIMES: To be based on reduced field data.

Figure 1

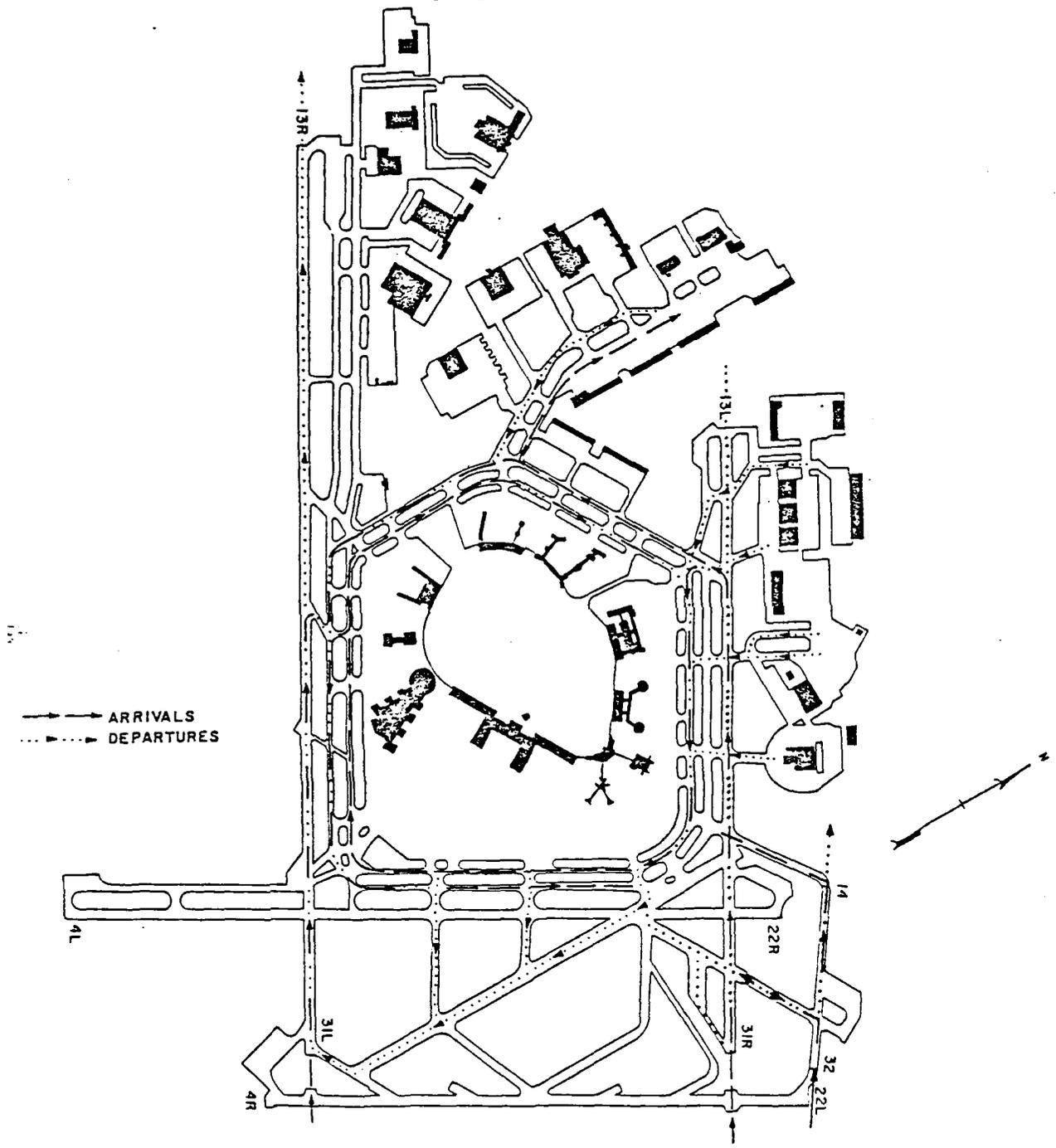


AIRFIELD NETWORK

JOHN F. KENNEDY INTERNATIONAL AIRPORT

Figure 2

RUNWAY-USE AND ROUTING FOR
JOHN F. KENNEDY INTERNATIONAL AIRPORT
CALIBRATION RUN



Attachment B

PRELIMINARY ANNUAL DELAY BASELINE
DATA PACKAGE

JOHN F. KENNEDY INTERNATIONAL AIRPORT

New York
Airport Improvement Task Force Delay Studies

Peat, Marwick, Mitchell & Co.
San Francisco, California

July 1978

1. Annual Demand: 346,061 (1977)

2. Group Specification:

3 day groups : High, Average, Low
 12 week groups : 12 months, January through December
 3 weather groups: VFR, IFR1, IFR2

9 runway uses :	<u>Arrivals</u> <u>Runway</u>	<u>Departures</u> <u>Runway</u>
1.	31R, 31L ^a	31L
2.	22L, 13R ^b	22R
3.	13L, 22L ^c	13R
4.	4R, 4L	4L
5.	31L	31L
6.	22R	22R
7.	4L	4L
8.	13R	13R
9.	31R	31R

3,4. Traffic Distribution:

Week Group	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
% of annual in one week	1.80	1.89	1.89	2.01	1.96	2.02	2.10	2.01	1.96	1.91	1.78	1.68
Number of weeks in month	4.43	4.00	4.43	4.29	4.43	4.29	4.43	4.43	4.29	4.43	4.29	4.43
% of annual in month	7.97	7.56	8.37	8.62	8.68	8.67	9.30	8.90	8.41	8.46	7.64	7.44

5,6. Daily Traffic Distribution:

Day Group	<u>High</u>	<u>Avg.</u>	<u>Low</u>
% of weekly in one day	15.4	14.5	13.3
Number of days	1	4	2
% of weekly traffic in day group	15.4	58.0	26.6

- a. 31L is used about 1.2% of the time.
 b. 13R is used about 1% of the time.
 c. 22L is used about 0.6% of the time.

7. Weather Occurrences:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
% VFR	89	89	84	92	88	83	90	89	88	93	91	90
% IFR1	5	5	6	3	4	7	6	8	8	5	3	6
% IFR2	6	6	10	5	8	10	4	3	4	2	6	4

8. Hourly Runway Capacity:

Runway Use	Hourly Capacity (Operations/hour)		
	VFR	IFR1	IFR2
1	76 ^d	61	61
2	87 ^e	61	60
3	67 ^f	53	53
4	75	61	60
5	52	49	48
6	52	49	48
7	52	49	48
8	52	49	48
9	52	49	48

9. Runway Use/Weather Group Demand Factors:

For all runway uses:

	Weather		
	VFR	IFR1	IFR2
	1.0	1.0	0.9

10. Runway Use Occurrences^g:

Runway Use	Percent Occurrence		
	VFR	IFR1	IFR2
1	36.1	-	0.3
2	23.0	0.7	2.3
3	17.9	0.5	1.2
4	6.7	1.6	1.6
5	2.6	-	-
6	2.4	0.1	0.1
7	0.9	0.2	0.2
8	1.1	-	-
9	0.5	-	-

d. When 31L is not used for arrivals, capacity is 65.

e. When 13R is not in use, capacity is 75.

f. When 22L is not used for arrivals, capacity is 60.

g. PMM&Co. estimates based on 1977 PMS records.

11. Hourly Traffic:

<u>Hour</u>	<u>% daily traffic</u>						
00-01	2.4	06-07	1.3	12-13	3.5	18-19	7.6
01-02	1.8	07-08	2.5	13-14	3.6	19-20	8.1
02-03	1.8	08-09	3.9	14-15	4.5	20-21	6.4
03-04	0.8	09-10	4.1	15-16	6.6	21-22	6.5
04-05	0.6	10-11	4.3	16-17	8.4	22-23	5.6
05-06	1.2	11-12	3.4	17-18	7.9	23-24	3.2

12,13. Delay Curve Specification: To be determined after airfield simulation runs.

14. Percent Arrivals:

<u>Hour</u>	<u>% Arrivals</u>						
00-01	66	06-07	76	12-13	38	18-19	44
01-02	56	07-08	51	13-14	57	19-20	49
02-03	66	08-09	45	14-15	69	20-21	48
03-04	43	09-10	21	15-16	71	21-22	40
04-05	44	10-11	37	16-17	66	22-23	35
05-06	69	11-12	45	17-18	58	23-24	31

15. Cancellation/Diversion Specification: To be provided by Task Force.

16. User-Specified Title: JFK ANNUAL BASELINE

ATTACHMENT C

PRELIMINARY CALIBRATION DATA PACKAGE

LaGuardia Airport

New York
Airport Improvement Task Force Delay Studies

Peat, Marwick, Mitchell & Co.
San Francisco, California

July 1978

INPUT DATAA. LOGISTICS

1. Title: LaGuardia Airport Airfield
Simulation Model Calibration Run
2. Random Number Seeds: 2017, 3069, 4235, 5873, 6981,
7137, 8099, 9355, 0123, 1985.
3. Start and Finish Times: 20.00-23.00 GMT, May 4
4. Print Options: Detailed run for one random number seed.
Summary run for ten random number seeds.
5. Airline Names:

<u>Name</u>	<u>Code</u>
Air Taxi	AT
Allegheny	AL
American	AA
Braniff	BN
Delta	DL
Eastern	EA
National	NA
North Central	NC
Northwest	NW
Ozark	OZ
Piedmont	PI
Southern	SO
Trans World	TW
United	UA
6. Processing Options: First run to check model input.
Other runs in COMPUTE mode.
7. Truncation Limits: + 3 standard deviations.
8. Time Switch: Not applicable.

B. AIRFIELD PHYSICAL CHARACTERISTICS

9. Airfield Network: See Figure 1.
10. Number of Runways: 2
11. Runway Identification: 13, 22

12. Departure Runway End Links: 50, 114
13. Runway Crossing Links: 82, 85, 86
14. Exit Taxiway Location: 77, 78, 80, 81, 82, 178, 179
15. Holding Areas: 44, 45, 46
16. Airline Gates: See Figure 1.
17. General Aviation Basing Areas: West of terminal area, 48.

C. ATC PROCEDURES

18. Aircraft Separations: These values are based on Report No. FAA-EM-78-8.

Arrival-Arrival Separation (n.m.)

		<u>Trail Aircraft Class</u>			
		<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
Lead	A	1.9	1.9	1.9	1.9
Aircraft	B	1.9	1.9	1.9	1.9
Class	C	2.7	2.7	1.9	1.9
	D	4.5	4.5	3.6	2.7

Departure-Departure Separations (seconds)

		<u>Trail Aircraft Class</u>			
		<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
Lead	A	35	35	45	50
Aircraft	B	35	35	45	50
Class	C	50	50	60	60
	D	120	120	120	120

Departure-Arrival Separation (n.m.): 0.4 miles

Arrival-Departure Separation (seconds): 10 seconds

19. Route Data: See Figure 2.
20. Two-Way Path Data: To be based on reduced field data.

21. Common Approach Paths:

<u>Aircraft Class</u>	<u>Length of Common Approach Path</u>
A	6.0
B	6.0
C	6.0
D	6.0

22. Vectoring Delays:

This input allocates delays among vectoring and holding. Model input values will be used that hold arrival aircraft if delays to arrival aircraft exceed 10 minutes.

23. Departure Runway Queue Control: Not applicable.24. Gate Hold Control: Not applicable.25. Departure Airspace Constraints:

Aircraft are not held at gates due to departure airspace constraints.

26. Inter-Arrival Gap:

With this runway use, arrival aircraft are delayed in the arrival airspace when departure delays exceed 10 minutes.

27. Runway Crossing Delay Control:

Arrival and departure runway operations are only interrupted for a taxiing aircraft to cross an active runway when the taxiing aircraft is delayed by 10 minutes or more.

D. AIRCRAFT OPERATIONAL CHARACTERISTICS28. Exit Taxiway Utilization:

	<u>Class</u>	<u>Exit Utilization (percent)</u>				
		<u>F</u>	<u>D</u>	<u>C</u>	<u>B</u>	<u>A</u>
Runway 22	A	100	0	0	0	0
	B	57	0	43	0	0
	C	0	6	58	36	0
	D	0	0	9	72	19

29. Arrival Runway Occupancy Times:

	Class	Runway Occupancy Times (seconds)				
		F	D	C	B	A
Runway 22	A	40	-	-	-	-
	B	42	-	48	-	-
	C	-	41	44	52	-
	D	-	-	47	58	64

30. Touch & Go Occupancy Times: Not applicable.31. Departure Runway Occupancy Times:

Aircraft Class	Runway Occupancy Time (seconds)	
	Mean	Standard Deviation
A	34	4
B	34	4
C	39	4
D	39	4

32. Taxi Speeds: To be based on reduced field data.33. Approach Speeds:

Aircraft Class	Approach Speed (knots)	
	Mean	Standard Deviation
A	110*	10
B	120	10
C	130	10
D	140	10

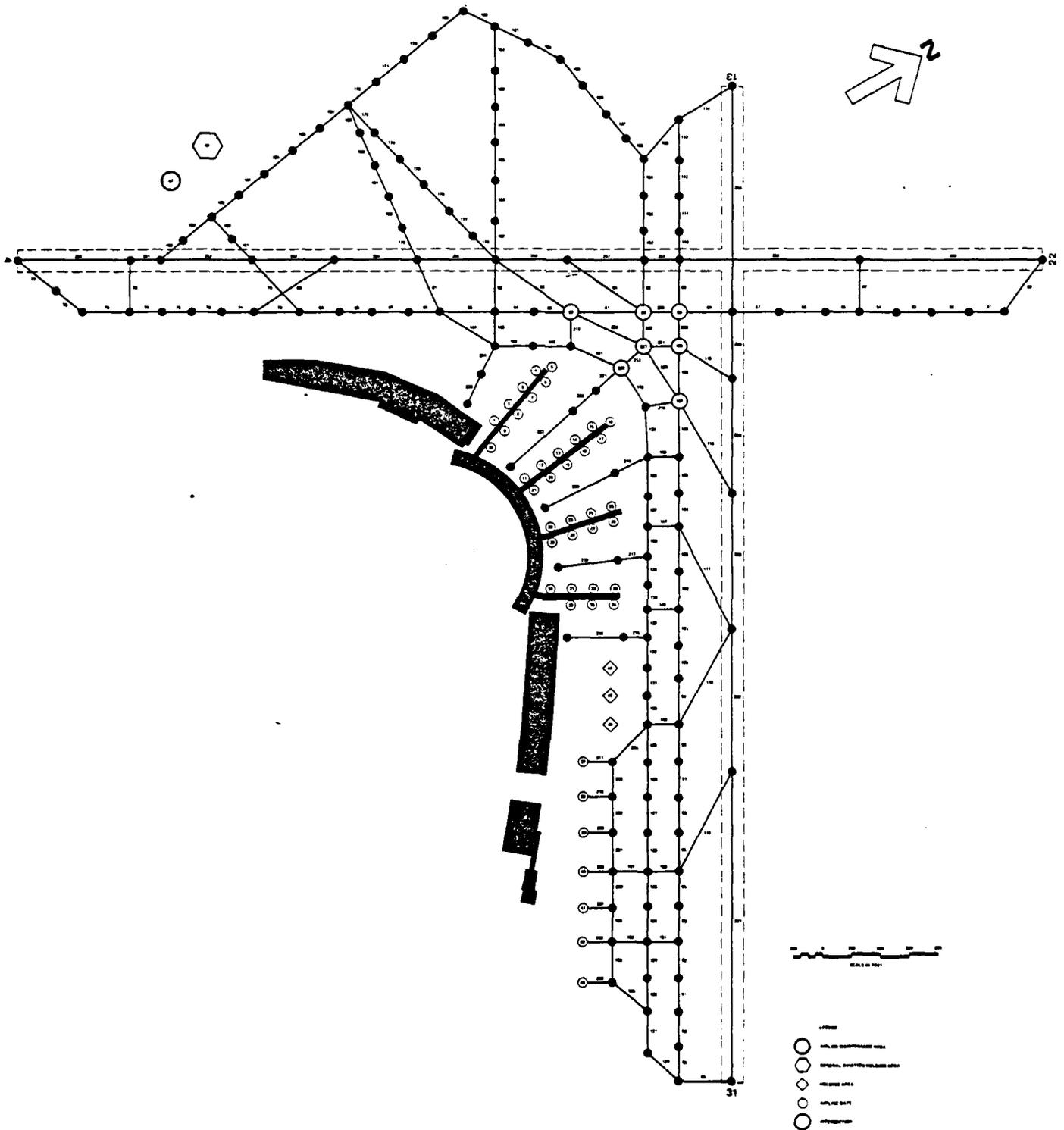
*120 knots in IFR.

34. Gate Service Times: Not applicable.35. Airspace Travel Times: To be based on reduced field data.36. Runway Crossing Times: To be based on reduced field data.37. Lateness Distribution: Not applicable.38. Demand: To be based on reduced field data.

OUTPUT DATA

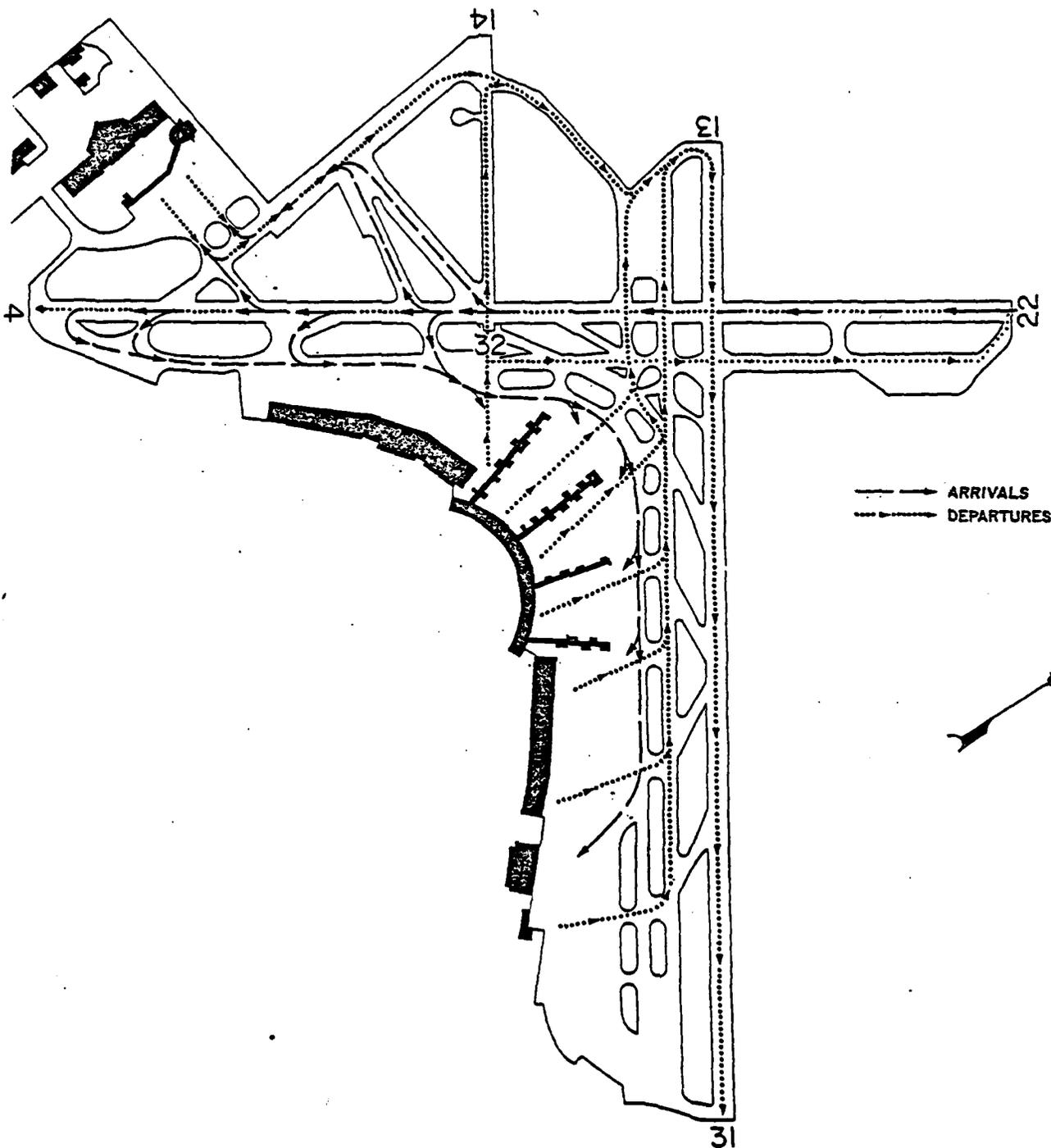
- A. FLOW RATES: To be based on reduced field data.
- B. DELAYS: To be based on reduced field data.
- C. TRAVEL TIMES: To be based on reduced field data.

Figure 1



**AIRFIELD NETWORK
LA GUARDIA AIRPORT**

RUNWAY-USE AND ROUTING FOR
LAGUARDIA AIRPORT
CALIBRATION RUN



Attachment D

PRELIMINARY ANNUAL DELAY BASELINE
DATA PACKAGE

LaGuardia Airport

New York
Airport Improvement Task Force Delay Studies

Peat, Marwick, Mitchell & Co.
San Francisco, California

July 1978

1. Annual Demand: 353,333 (1977)

2. Group Specification:

3 day groups : High, Average, Low
 12 week groups : 12 months, January through December
 3 weather groups: VFR, IFR1, IFR2

7 runway uses :	<u>Arrivals Runway</u>	<u>Departures Runway</u>
1.	22	13
2.	22	31
3.	31	31
4.	31	4
5.	4	13
6.	13	4
7.	4	4
8.	13	13

3,4. Traffic Distribution:

Week Group	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
% of annual in one week	1.75	1.81	1.88	1.92	1.90	2.06	1.95	2.01	1.99	1.99	1.93	1.82
Number of weeks in month	4.43	4.00	4.43	4.29	4.43	4.29	4.43	4.43	4.29	4.43	4.29	4.43
% of annual in month	7.75	7.24	8.33	8.24	8.42	8.84	8.64	8.90	8.54	8.82	8.28	8.06

5,6. Daily Traffic Distribution:

Day Group	<u>High</u>	<u>Avg</u>	<u>Low</u>
% of weekly in one day	16.2	14.8	10.9
Number of days	3	2	2
% of weekly traffic in day group	48.6	29.6	21.8

7. Weather Occurrences:

Month	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
% VFR	88	97	85	92	89	86	93	91	91	92	89	89
% IFR1	6	5	6	3	6	9	5	7	7	5	6	6
% IFR2	6	5	9	5	5	5	2	2	2	3	5	5

8. Hourly Runway Capacity Parameters:

<u>Runway Use</u>	<u>Hourly Capacity (Operations/hour)</u>		
	<u>VFR</u>	<u>IFR1</u>	<u>IFR2</u>
1	77	74	55
2	76	73	44
3	50	49	-
4	77	-	-
5	77	74	56
6	74	-	-
7	50	49	45
8	49	36	36

9. Runway Use/Weather Group Demand Factors:

For all runway uses:

	<u>Weather</u>		
	<u>VFR</u>	<u>IFR1</u>	<u>IFR2</u>
	1.0	1.0	0.9

10. Runway Use Occurrences:*

<u>Runway Use</u>	<u>Percent Occurrence</u>		
	<u>VFR</u>	<u>IFR1</u>	<u>IFR2</u>
1	23.2	1.6	0.8
2	23.8	0.4	0.2
3	18.0	0.1	--
4	14.9	--	--
5	3.7	1.6	1.8
6	4.4	--	--
7	1.6	1.1	0.6
8	1.2	0.6	0.4

*PMM&Co. estimates based on 1977 PMS records.

11. Hourly Traffic:

<u>Hour</u>	<u>% daily traffic</u>						
00-01	0.6	06-07	0.4	12-13	5.9	18-19	7.1
01-02	0.2	07-08	4.1	13-14	6.5	19-20	7.2
02-03	0.1	08-09	6.7	14-15	6.2	20-21	5.8
03-04	0.1	09-10	7.0	15-16	6.3	21-22	5.3
04-05	0.1	10-11	5.9	16-17	6.8	22-23	2.8
05-06	0.2	11-12	5.9	17-18	7.0	23-24	1.8

12,13. Delay Curve Specification: To be determined after airfield simulation runs.

14. Percent Arrivals:

<u>Hour</u>	<u>% Arrivals</u>						
00-01	53	06-07	69	12-13	51	18-19	53
01-02	69	07-08	35	13-14	49	19-20	50
02-03	57	08-09	50	14-15	51	20-21	51
03-04	50	09-10	46	15-16	46	21-22	51
04-05	71	10-11	53	16-17	55	22-23	48
05-06	62	11-12	52	17-18	48	23-24	61

15. Cancellation Diversion Specification: To be provided by Task Force.

16. User-Specified Title: LGA ANNUAL BASELINE