

Traffic Management Model for Determining Airport Acceptance Rate (AAR)

Simplified methodology

Doc 9971
Appendix C

Definitions

Airport Acceptance Rate (AAR):

A dynamic parameter specifying the number of arrival aircraft that an airport, in conjunction with:

- terminal airspace
- ramp space
- parking space, and
- terminal facilities

can accept under specific conditions during any consecutive 60 minute period

Definitions

Airport Primary Runway Configuration:

An airport configuration which handles 3 percent or more of the annual operations

Definitions

Potential AAR:

The theoretical acceptance rate at the runway threshold – before taking other factors into consideration

Definitions

Actual AAR:

The Potential AAR at the runway threshold *adjusted* for other factors

Definitions

AAR adjustment factors:

The factors that must be considered when establishing the actual AAR. These may include:

- Weather conditions
- Runway conditions
- Aircraft type and fleet mix on final
- Taxiway layout
- Ramp space

For any runway configuration:

- Potential AAR
- Adjustment Factors

Actual AAR

Calculate the Actual AAR value for each airport runway configuration for the following weather conditions:

Visual Meteorological Conditions (VMC) - weather allows vectoring for visual approaches

Marginal VMC - weather does not allow vectoring for visual approaches, but visual separation on final is possible

Instrument Meteorological Conditions (IMC) - visual approaches and visual separation on final are not possible

Step 1

Calculate the Potential AAR

Determine the

- **average ground speed** crossing the runway threshold, and
- **the spacing interval** required between successive arrivals

Divide the groundspeed by the spacing interval to determine the Potential AAR

Step 1

Calculate the Potential AAR – formula method

Formula: Ground speed in knots at the runway threshold divided by spacing interval at the runway threshold in nautical miles

NOTE: when the quotient is a fraction, round down to the next whole number

Step 1

Potential AAR – examples

Example 1: $130 \text{ KTS} / 5 \text{ NM} = 26$

Potential AAR = 26 arrivals per hour

Example 2: $120 \text{ KTS} / 7 \text{ NM} = 17.14$
(round down to 17)

Potential AAR = 17 arrivals per hour

Step 1

Calculate the Potential AAR – table method

	<i>NM between aircraft at the runway threshold</i>									
	3	3.5	4	4.5	5	6	7	8	9	10
<i>Ground speed at the runway threshold</i>	<i>Potential AAR</i>									
140 kt	46	40	35	31	28	23	20	17	15	14
130 kt	43	37	32	28	26	21	18	16	14	13
120 kt	40	34	30	26	24	20	17	15	13	12
110 kt	36	31	27	24	22	18	15	13	12	11

Step 2

Identify any conditions that may reduce the Potential AAR. Conditions may include:

- Intersecting arrival and departure runways
- Lateral distance between arrival runways
- Dual use runways – runways that share arrivals and departures
- Taxiway layouts
- Availability of high-speed taxiways

Step 2

Conditions may include (continued):

- Airspace limitations and constraints
- Procedural limitations (noise abatement, missed approach procedures)
- Meteorological conditions

Step 3

For any runway configuration:

- Potential AAR
- Adjustment Factors

Actual AAR

Step 3

Example of Actual AAR:

<i>Runway configuration</i>	<i>AAR for VMC</i>	<i>AAR for marginal VMC</i>	<i>AAR for IMC</i>
RWY 13	24	21	19
RWY 31	23	20	17

Administrative considerations:

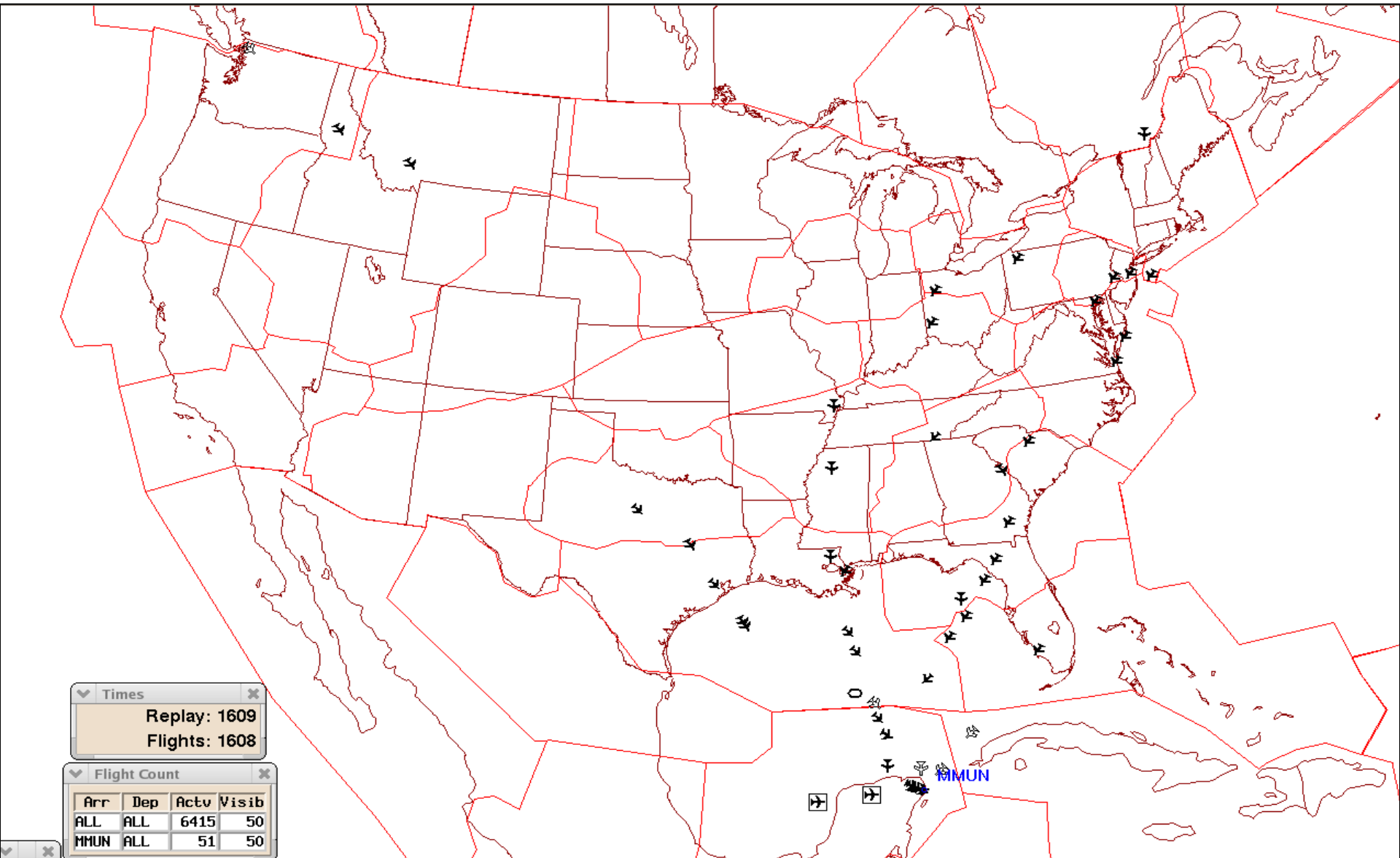
- Identify who is responsible for the establishment and implementation of AARs at the airports
- Recommend a collaborative and transparent process
- Establish a table of actual AARs for the airport runway configuration(s)
- Review and validate the airport runway configurations and associated AARs at least once each year

Why?

If you can measure it, you can manage it.



STATES/TERRITORIES	En-route Capacity	Apron / Parking Capacity	AAR		
			VFR	MVFR	I FR
Antigua and Barbuda	TMA Capacity 15 acft / Hr	6/H, 14/M TP, Ample parking for Exe Jets & L acft on disused Rwy	10	8	6
Barbados	TMA Capacity 24 acft / Hr	16/H, 6/M, or Combi: 10/H, 6M J, 20/M TP /Exe Jets, 3/L P & 5/L J / P	15	11	8
French Antilles - Guadeloupe	TMA Capacity 27 acft / Hr	10/H, 1/M J, 8/M TP or Combi: 8/H, 5/M J, 6/M TP 6/L P or 8/H, 5/M J, 2/M TP, 13/L P	X		
- Martinique	TMA Capacity 22 acft / Hr	8/H, 4/M J, 6/M RJ, 9/M TP, 1/L J, 3/L P	X		
Grenada	TMA Capacity 13 acft / Hr	3/H, 2/M J, 2/M TP. Gen Av Parking for 4/M Exe Jets	11	9	7
St. Kitts/Nevis - (R.L. Bradshaw Intl)	16 acft / Hr	8/HJ, 7/M TP Combi Parking for more than No. of Positions	17	14	6
- New Castle	Not Applicable	3/M TP 2/M Exec Jet, Long Term, 4/L T	15	12	5
Saint Lucia – <u>Hewanorra</u>	CTR Capacity 7 acft / 15 min	3/H, 2/M J, 1/M TP, 3/L P / J or Combi: 2/H, 3/M, 3/M TP, 3/L P / J	6	acft / Hr	
= George Charles		3/M TP, 1/L P	X		
St. Vincent and the Grenadines	TMA Capacity 10 acft / 15 min	3/M TP & 4/L P (E.T. Joshua)	10	acft / Hr	
Trinidad & Tobago - <u>Piarco</u>	ACC - Sector Capacity 12 acft / 15 min. Combi 10 acft / 15 min	14/H, 11/M J, 3/M TP, 2/L P. Off gate 3/L J or Combi: 5/L J & P	14	10	8
- Crown Pt.	CTR Capacity 10 acft / 15 min	3/H, 2/M J, 2/M TP, 4/L P	11	8	6



Open Data Set Map Search By Callsign GDT Mode IPM Mode Update

FCAMU1/H

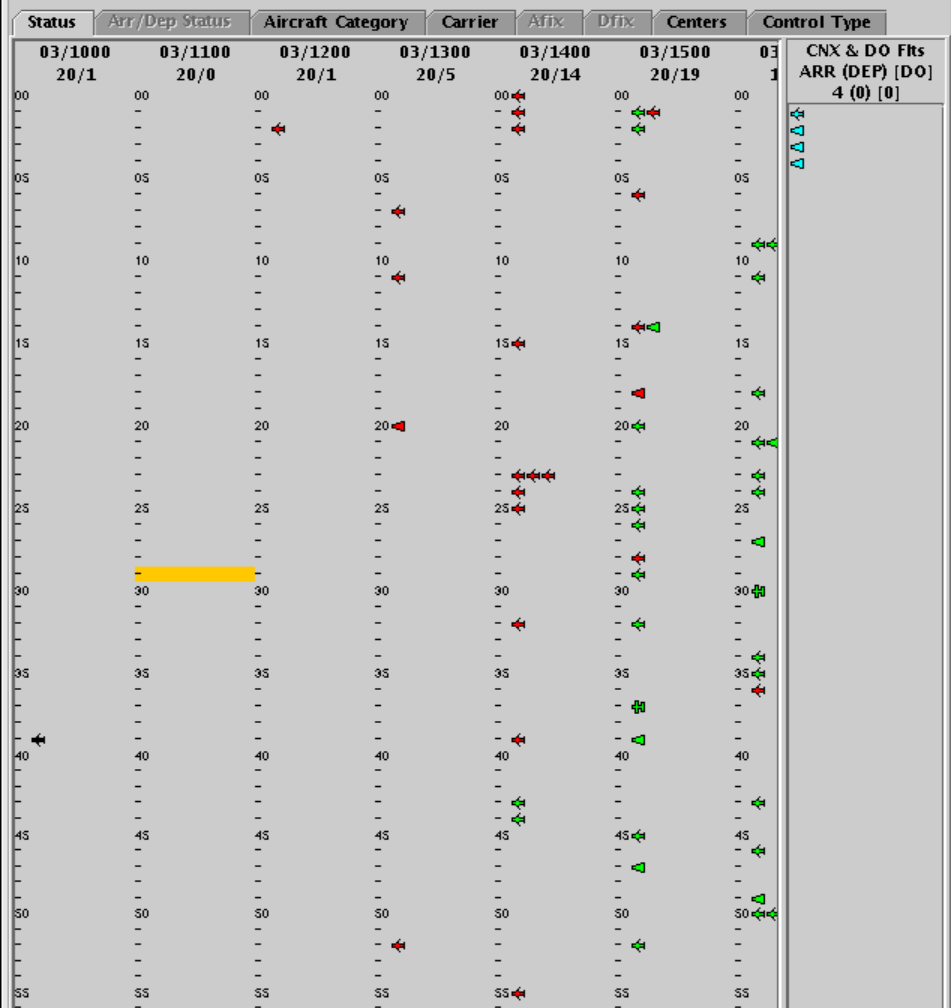
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File View Time Line Display Help



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Flight List: FCAMU1 2010/Apr/03 1129 HIST

File View Flight List Help



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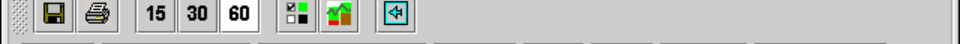
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	ACID	ORIG	DEST	ETD	ENTRY	CTL_ELEM	DCENTR	ACENTR
1	GWY502	ORD	MMUN	P03/1141	03/1501	-	ZAU	ZMX
2	SCX563	MSP	MMUN	A03/1104	03/1501	-	ZMP	ZMX
3	AWE820	CLT	MMUN	P03/1205	03/1502	-	ZTL	ZMX
4	TRS7751	MKE	MMUN	A03/1103	03/1506	-	ZAU	ZMX
5	SCX571	MSP	MMUN	A03/1115	03/1514	-	ZMP	ZMX
6	AWE803	PHL	MMUN	P03/1157	03/1514	-	ZNY	ZMX
7	TSC578	CYUL	MMUN	E03/1108	03/1518	-	CZU	ZMX
8	DAL529	ATL	MMUN	L03/1259	03/1520	-	ZTL	ZMX
9	AAL2185	MIA	MMUN	L03/1349	03/1524	-	ZMA	ZMX
10	ATE6809	STL	MMUN	P03/1232	03/1525	-	ZKC	ZMX
11	AMX6483	ORD	MMUN	P03/1215	03/1526	-	ZAU	ZMX

Total flights: 19

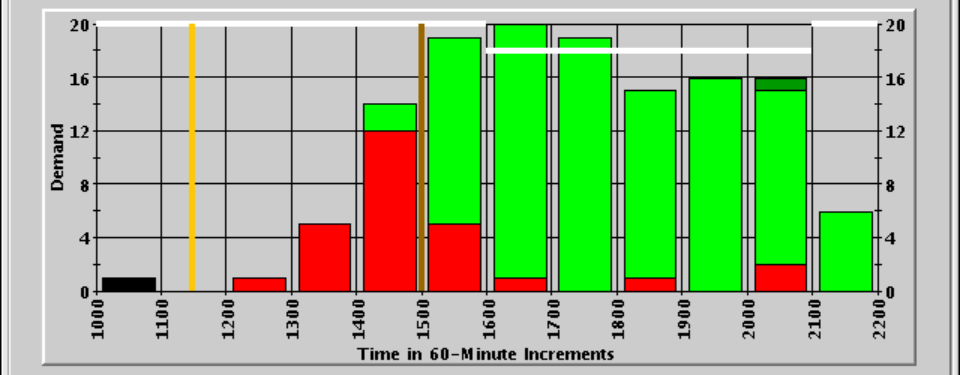
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File View Bar Graph Display Help



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FCAMU1/H

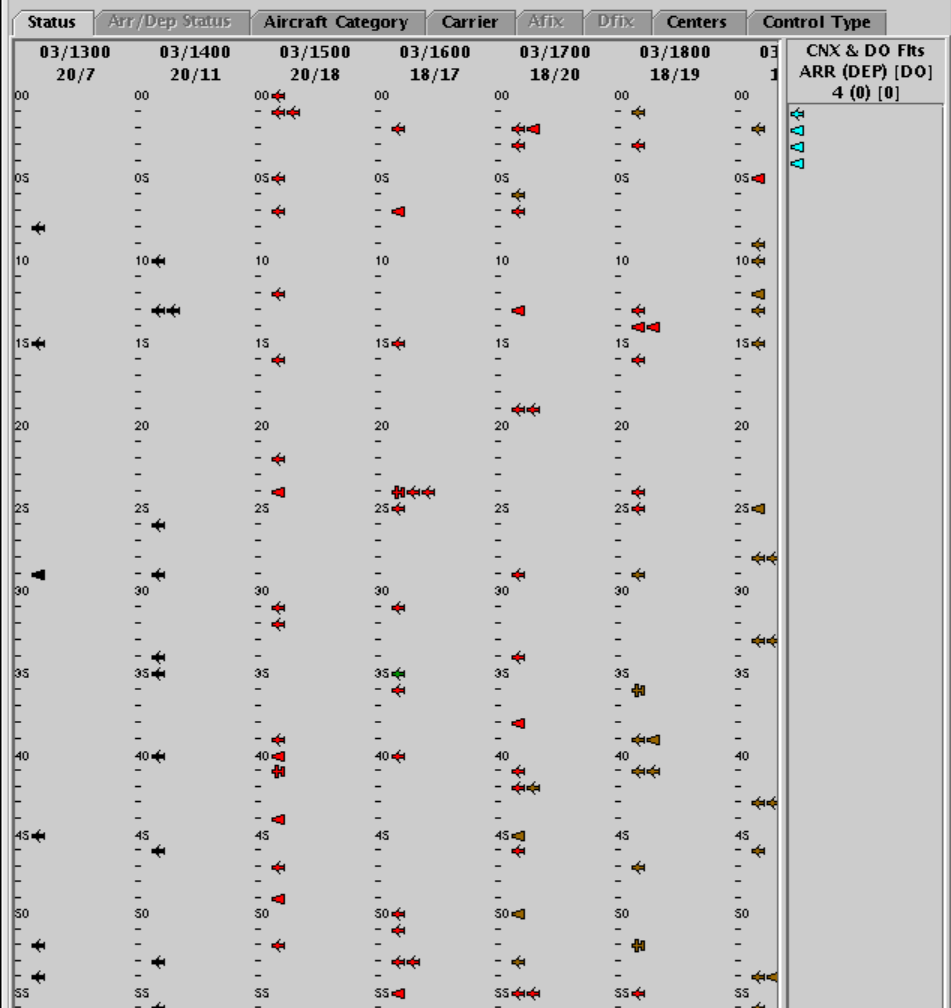
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File View Time Line Display Help



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Flight List: FCAMU1 2010/Apr/03 1459 HIST

File View Flight List Help



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Current Info
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	ACID	ORIG	DEST	ETD	ENTRY	CTL_ELEM	DCENTR	ACENTR
1	AWE820	CLT	MMUN	A03/1209	03/1500	FCAMU1	ZTL	ZMX
2	TRS7751	MKE	MMUN	A03/1103	03/1501	FCAMU1	ZAU	ZMX
3	SCX571	MSP	MMUN	A03/1115	03/1501	FCAMU1	ZMP	ZMX
4	GWY502	ORD	MMUN	E03/1133	03/1505	FCAMU1	ZAU	ZMX
5	DAL529	ATL	MMUN	A03/1257	03/1507	FCAMU1	ZTL	ZMX
6	COA164	IAH	MMUN	A03/1318	03/1512	FCAMU1	ZHU	ZMX
7	AAL2185	MIA	MMUN	A03/1349	03/1516	FCAMU1	ZMA	ZMX
8	WJA2900	CYHZ	MMUN	A03/1040	03/1522	FCAMU1	CZM	ZMX
9	TSC578	CYUL	MMUN	E03/1108	03/1524	FCAMU1	CZU	ZMX
10	JBU761	JFK	MMUN	E03/1149	03/1531	FCAMU1	ZNY	ZMX
11	ATE6809	STL	MMUN	E03/1239	03/1532	FCAMU1	ZKC	ZMX

Total flights: 18

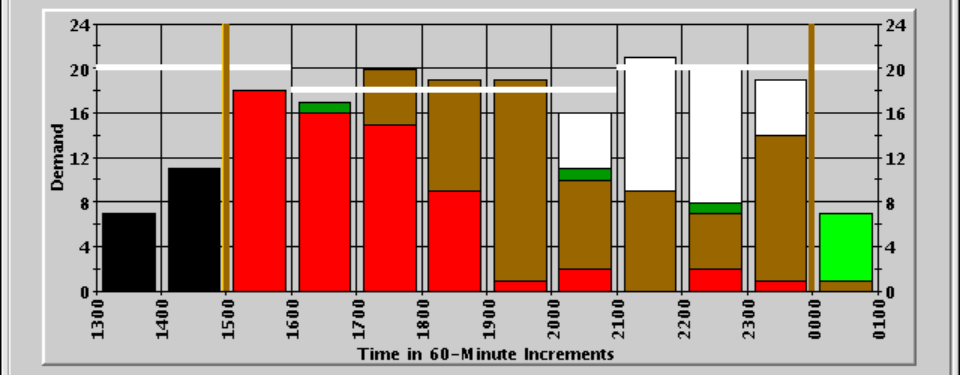
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Status Arr/Dep Status Aircraft Category Carrier Affix Dfifx Centers Control Type

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8th
Global ATFM
Conference



Thank you !