

## **Appendix F**

### **Jet Fuel Consumption Due to Departure Procedures Component**

## Appendix F – Reduced Fuel Consumption Due to Departure Procedures Component

This Appendix describes the methodology used to estimate the reduction in fuel consumption that would occur with the Departure Procedures Component of the Proposed Project. As discussed in Section 1.3 of this EA, implementing the Departures Procedures Component would increase departure rates from Runway 8R and Runway 27R, thereby reducing taxi-out delay. The reduction in taxi-out delay would reduce the amount of fuel consumed by aircraft waiting in departure queues on these runways. Due to air traffic control procedures that are used for runway crossings of Runway 8R, a 2.0 minute reduction per departure should be attainable on this runway. However, to be conservative, the analysis assumed only a 1.5 minute reduction would be achieved. For the purpose of the analysis, it is assumed that a 1.0 minute per departure reduction is attainable on Runway 27R.

The EDMS provides estimates of fuel consumed when aircraft are delayed. To be consistent with the aircraft noise analysis prepared in support of this EA, the INM departure data assignments for Runway 8R and Runway 27R were extracted from the INM and used in the EDMS. Notably, because the EDMS database has different data than the INM with respect to aircraft engines, the distribution of aircraft types and respective engine assignments was made using data from the DOA's Noise and Operations Monitoring System (NOMS). The aircraft/engine distribution used in the EDMS to estimate the reduction in fuel consumption with the Departure Procedures Component is provided in **Table F-1**. Because the input for the INM assumes aircraft operational values to six decimal places representing the number of departures on an annual average day and the EDMS requires whole numbers representing data for an entire year, the INM's fractional average day data was converted to whole numbers representing activity over an entire year. The calculation that was used to convert the Runway 27R INM departures to EDMS departures is provided below:

$$\text{Number of INM Daily Departures} \times \% \text{ of Aircraft Type in NOMS database} \times 365 \text{ Days per Year} = \text{Number of EDMS Annual Departures (Rounded to the Nearest Whole Number)}$$

The aircraft data in Table F-1 (aircraft types and number of departures) and the anticipated reduction in departure delay discussed above (1.5 minutes on Runway 8R and 1.0 minute on Runway 27R) were used as input to the EDMS to obtain the estimated reduction in fuel consumption with the Departure Procedures Component of the Proposed Project. Table F-1 also provides the EDMS estimated levels of fuel saved by each type of aircraft and the total estimated amount for the years 2010 and 2015.

**Table F-1**  
**Reduced Fuel Consumption -- Departure Procedures Component**

EDMS Aircraft Name	EDMS Engine Assignment	Annual Departures With/Without Proposed Project <sup>a</sup>				Reduced Fuel Consumption With Proposed Project (gallons) <sup>b</sup>			
		Runway 27R		Runway 8R		Runway 27R		Runway 8R	
		2010	2015	2010	2015	2010	2015	2010	2015
B717-200	BR700-715A1-30	17,775	17,187	9,013	8,238	76,423	73,895	58,127	53,129
B737-500	CFM56-3C-1	675	0	345	0	3,599	0	2,759	0
B737-700	CFM56-7B22	11,726	13,287	7,467	8,461	52,937	59,984	50,564	57,295
B737-800	CFM56-7B26	9,811	17,710	4,099	7,006	47,666	86,043	29,872	51,057
B737-200	JT8D-9	0	0	0	0	0	0	0	0
B737-300	CFM56-3-B1	0	0	0	0	0	0	0	0
B747-400	CF6-80C2B5F 1862 M39	630	840	14	18	11,160	14,880	372	478
B757-200	PW2037	19,675	20,618	7,265	7,170	128,581	134,743	71,218	70,286
B767-300	CF6-80C2B7F 1862M39	9,172	9,182	2,849	2,871	80,053	80,140	37,299	37,587
B767-400	CF6-80C2B8FA 1862M39	1,942	2,240	555	600	17,117	19,743	7,338	7,933
B777-200	Trent 892	1,499	2,435	141	212	19,335	31,408	2,728	4,102
A318-100 Series	CFM56-5B8/P SAC	2	2	10	16	8	8	61	97
A319-100 Series	CFM56-5B6/P	390	624	2,617	3,974	1,626	2,602	16,371	24,860
A320-100 Series	V2500-A1	930	1,477	1,577	2,383	4,958	7,874	12,611	19,057
A320-200 Series	CFM56-5B3/2P DAC-II	90	143	153	231	503	799	1,283	1,937
A330-200 Series	CF6-80E1A3 Standard	185	2,592	9	113	1,806	25,298	132	1,654
A340-300 Series	CFM56-5C4	213	213	0	0	2,271	2,271	0	288
DC9-30	JT8D-7 Series	12	0	302	0	67	0	2,514	0
DC9-40	JT8D-11	12	0	302	0	75	0	2,834	0
DC9-50	JT8D-17	0	0	208	0	0	0	1,977	0
MD-82	JT8D-217C	510	392	1,336	966	3,004	2,309	11,804	8,535

**Table F-1**  
**Reduced Fuel Consumption -- Departure Procedures Component**

EDMS Aircraft Name	EDMS Engine Assignment	Annual Departures With/Without Proposed Project <sup>a</sup>				Reduced Fuel Consumption With Proposed Project (gallons) <sup>b</sup>			
		Runway 27R		Runway 8R		Runway 27R		Runway 8R	
		2010	2015	2010	2015	2010	2015	2010	2015
MD-81	JT8D-217C	20	16	13	10	118	94	115	88
MD-83	JT8D-219	260	198	167	127	1,502	1,144	1,448	1,101
MD-88	JT8D-219	21,484	16,345	13,753	10,444	124,146	94,450	119,208	90,526
MD-90	V2525-D5	97	74	62	47	534	407	512	388
A340-300 Series	CFM56-5C4	0	555	0	18	0	5,918	0	0
AT72-200	PW127	0	0	0	0	0	0	0	0
Bombardier CRJ-100	CF34-3A1 LEC II	705	715	820	832	1,503	1,525	2,623	2,661
Bombardier CRJ-200	CF34-3B	20,253	20,558	23,573	23,927	42,581	43,222	74,342	75,458
Bombardier CRJ-700	CF34-8C1	6,563	6,662	7,639	7,754	19,470	19,764	33,993	34,505
Bombardier CRJ-900	CF34-8C5 LEC	1,707	1,733	1,987	2,017	4,719	4,791	8,240	8,364
Embraer ERJ135	AE3007A1/3 Type 3	95	56	166	98	2,363	1,397	6,216	3,673
Embraer ERJ145	AE3007A1E Type 3	1,157	684	2,029	1,199	8,633	10,187	17,440	20,575
Embraer ERJ 175	CF34-8E5 LEC	7	4	12	7	183	108	481	284
Embraer ERJ170	CF34-8E5 LEC	3,118	3,679	4,199	4,954	19	11	50	29
Embraer ERJ190	CF34-10E	106	125	143	168	369	435	747	878
Antonov 12 Cub	T56 Series I	4	6	0	0	33	49	0	0
B747-200	CF56-50E2	205	308	0	0	2,873	4,317	0	0
B727-100	JT8D-7 Series	23	0	10	0	191	0	125	0
B727-200	JT8D-17R	335	0	148	0	3,349	0	2,219	0
B747-400	CF6-80C2B5F 1862 M39	226	339	0	0	4,003	6,005	0	0
B757-200	PW2037	54	75	694	971	353	490	6,803	9,519
B767-200	CF6-80A	37	55	185	278	239	355	1,790	2,689

**Table F-1  
Reduced Fuel Consumption -- Departure Procedures Component**

EDMS Aircraft Name	EDMS Engine Assignment	Annual Departures With/Without Proposed Project <sup>a</sup>				Reduced Fuel Consumption With Proposed Project (gallons) <sup>b</sup>			
		Runway 27R		Runway 8R		Runway 27R		Runway 8R	
		2010	2015	2010	2015	2010	2015	2010	2015
B767-300	CF6-80C2B7F 1862M39	5	8	27	41	44	70	353	537
A300B4-600 Series	PW4158	17	17	421	421	154	154	5,729	5,729
A310-200 Series	CF6-80A3	11	11	273	273	71	71	2,641	2,641
MD-10-1	CF6-6D	36	36	405	405	401	401	6,770	6,770
DC8-70	CFM56-2-C5	47	24	262	131	517	264	4,326	2,163
DC9-30	JT8D-7 Series	0	0	9	0	0	0	75	0
DC9-40	JT8D-11	0	0	130	0	0	0	1,220	0
MD-11	CF6-80C2D1F 1862M39	340	567	167	278	4,495	7,496	3,312	5,513
B777-200	Trent 892	74	223	90	269	954	2,876	1,741	5,205
Raytheon Beechjet 400	JT15D-5, -5A, -5B	26	26	118	118	33	33	225	225
Raytheon Beech Baron 58	TIO-540-J2B2	32	32	147	147	4	4	30	30
Cessna 310	TIO-540-J2B2	2	2	9	9	0	0	2	2
Mitsubishi MU-2	TPE331-10	127	127	587	587	90	90	621	621
Piaggio P.180 Avanti	PT64-66	2	2	15	15	1	1	15	15
Cessna 210 Centurion	TIO-540-J2B2	0	0	139	139	0	0	14	14
Cessna 560 Citation V	JT15D-5, -5A, -5B	197	197	307	307	251	251	586	586
Mitsubishi MU-300 Diamond	JT15D-4 series	3	3	5	5	3	3	8	8
Cessna 208 Caravan	PT61-114A	101	101	253	253	22	22	82	82
Bombardier Learjet 25	CJ610-6	34	34	139	139	94	94	574	574
Cessna 750 Citation X	AE3007C Type 2	3	3	26	26	5	5	63	63
Dassault Falcon 2000	PW308C Annular	0	0	4	4	0	0	12	12
Gulfstream V-SP	BR700-710A1-10	1	1	7	7	4	4	40	40

**Table F-1**  
**Reduced Fuel Consumption -- Departure Procedures Component**

EDMS Aircraft Name	EDMS Engine Assignment	Annual Departures With/Without Proposed Project <sup>a</sup>				Reduced Fuel Consumption With Proposed Project (gallons) <sup>b</sup>			
		Runway 27R		Runway 8R		Runway 27R		Runway 8R	
		2010	2015	2010	2015	2010	2015	2010	2015
Hawker HS-125 Series 700	TFE731-3	3	3	23	23	3	3	39	39
Bombardier Learjet 35A-36A (C-21A)	TFE731-2-2B	71	71	589	589	73	73	912	912
Raytheon Beech Baron 58	TIO-540-J2B2	163	163	199	199	22	22	40	40
Raytheon King Air 90	PT6A-28	32	32	39	39	20	20	36	36
Cessna 414	TIO-540-J2B2	30	30	36	36	4	4	7	7
Piper Pa-32 Cherokee Six	TIO-540-J2B2	62	62	75	75	4	4	8	8
Cessna 172 Skyhawk	O-320	75	75	92	92	2	2	4	4
Cessna 560 Citation V	JT15D-5, -5A, -5B	200	200	312	312	255	255	596	596
Dassault Falcon 2000	PW308C Annular	181	181	277	277	349	349	800	101
Israel IAI-1126 Galaxy	PW306A Annular	113	113	69	69	205	205	188	188
Cessna 750 Citation X	AE3007C Type 2	14	14	43	43	23	23	105	105
Dassault Falcon 2000	PW308C Annular	11	11	35	35	21	21	101	800
Gulfstream IV-SP	TAY Mk611-8	34	34	108	108	161	161	766	766
Gulfstream V-SP	BR700-710A1-10	15	15	48	48	57	57	276	276
Hawker HS-125 Series 700	TFE731-3	33	33	104	104	37	37	174	174
Bombardier Learjet 35A-36A (C-21A)	TFE731-2-2B	107	107	337	337	110	110	522	522
<b>TOTAL</b>		133,907	143,687	99,788	101,070	676,861	749,853	619,225	624,436

<sup>a</sup> Average annual day data extracted from INM and rounded to nearest whole value to represent annual operational levels.

<sup>b</sup> Assumes a reduction in departure delay of 1.5 minutes on Runway 8R and 1.0 minute on Runway 27R.

Source: KB Environmental Sciences, Inc. 2009