

APPENDIX

Fuel savings associated with the introduction of Rnav routes (Phase I)

Sao Paulo - Rio de Janeiro - Miami (TF9)

Routes	Conv. Dist (nm)	Rnav Dist (nm)	Regular FT (min)	New FT (min)	Flying time % Saving	Flight Level % Saving	Flights Total % fuel saving
Sao Paulo - Miami	3571	3507	446.4	438.4	1.79%	0.71%	2.51%
Rio de Janeiro - Miami	3718	3624	464.8	453.0	2.53%	0.74%	3.27%

Note: 10% of flights not operating at their requested flight level.

Sao Paulo - Rio de Janeiro - New York (TF10)

Routes	Conv. Dist (nm)	Rnav Dist (nm)	Regular FT (min)	New FT (min)	Flying time % Saving	Flight Level % Saving	Flights Total % fuel saving
Sao Paulo - New York	4168	4106	521.0	513.3	1.49%	0.42%	1.90%
Rio de Janeiro - NY	4239	4174	529.9	521.8	1.53%	0.42%	1.96%

Note: 5% of flights not operating at their requested flight level.

Buenos Aires - New York (TF11)

Routes	Conv. Dist (nm)	Rnav Dist (nm)	Regular FT (min)	New FT (min)	Flying time % Saving	Flight Level % Saving	Flights Total % fuel saving
Buenos Aires - New Yrk	4681	4605	585.1	575.6	1.62%	0.47%	2.09%

Note: 5% of flights not operating at their requested flight level.

**Fuel savings associated
with the introduction of
Rnav routes (Phase II)**

Sao Paulo - Rio de Janeiro - Europe (TF4)

City Pairs Routes	Conv. Dist (nm)	Rnav Dist (nm)	Regular FT (mins)	New FT (mins)	Flying time % Saving	Flight Level % Saving	Flights Total % fuel savings
Buenos Aires - Frankfurt	6274	6207	784.25	775.88	1.07%	3.01%	4.08%
Buenos Aires - London	6165	6003	770.63	750.38	2.63%	2.96%	5.59%
Buenos Aires - Dakar	3807	3783	475.88	472.88	0.63%	1.83%	2.46%
Buenos Aires - Madrid	5499	5439	687.38	679.88	1.09%	2.64%	3.73%
Buenos Aires - Milan	6167	6044	770.88	755.50	1.99%	2.96%	4.95%
Buenos Aires - Paris	6104	5989	763.00	748.63	1.88%	2.93%	4.81%
Buenos Aires - Roma	6335	6019	791.88	752.38	4.99%	3.04%	8.03%
Fortaleza - Lisbon	3222	3028	402.75	378.50	6.02%	1.55%	7.57%
Recife - Frankfurt	4225	4160	528.13	520.00	1.54%	2.03%	3.57%
Recife Cape Verde	1655	1653	206.88	206.63	0.12%	0.79%	0.92%
Recife - Lisbon	3342	3160	417.75	395.00	5.45%	1.60%	7.05%
Rio de Janeiro - Frankfurt	5234	5163	654.25	645.38	1.36%	2.51%	3.87%
Rio de Janeiro - Lisbon	4351	4163	543.88	520.38	4.32%	2.09%	6.41%
Rio de Janeiro - Madrid	4427	4396	553.38	549.50	0.70%	2.12%	2.83%
Rio de Janeiro - Paris	5199	4956	649.88	619.50	4.67%	2.50%	7.17%
Rio de Janeiro - Roma	5002	4950	625.25	618.75	1.04%	2.40%	3.44%
Rio de Janeiro - Zurich	5088	5056	636.00	632.00	0.63%	2.44%	3.07%
Salvador - Lisbon	3691	3506	461.38	438.25	5.01%	1.77%	6.78%
Santiago - Luxem burg	6616	6438	827.00	804.75	2.69%	3.18%	5.87%
Santiago - Madrid	5962	5784	745.25	723.00	2.99%	2.86%	5.85%
Sao Paulo - Amsterdam	5342	5275	667.75	659.38	1.25%	2.56%	3.82%
Sao Paulo - Dakar	2889	2853	361.13	356.63	1.25%	1.39%	2.63%
Sao Paulo - Frankfurt	5355	5287	669.38	660.88	1.27%	2.57%	3.84%
Sao Paulo - Las Palmas	3610	3569	451.25	446.13	1.14%	1.73%	2.87%
Sao Paulo - Lisbon	4483	4282	560.38	535.25	4.48%	2.15%	6.64%
Sao Paulo - London	5162	5105	645.25	638.13	1.10%	2.48%	3.58%
Sao Paulo - Madrid	4566	4521	570.75	565.13	0.99%	2.19%	3.18%
Sao Paulo - Milan	5233	5118	654.13	639.75	2.20%	2.51%	4.71%
Sao Paulo - Munich	5414	5319	676.75	664.88	1.75%	2.60%	4.35%
Sao Paulo - Paris	5320	5075	665.00	634.38	4.61%	2.55%	7.16%
Sao Paulo - Porto	4460	4413	557.50	551.63	1.05%	2.14%	3.19%
Sao Paulo - Roma	5168	5091	646.00	636.38	1.49%	2.48%	3.97%
Sao Paulo - Zurich	5227	5185	653.38	648.13	0.80%	2.51%	3.31%

Note:

As a result of the surveys conducted at Kodos (30%), Rakud (22%), Nanik (22%) and Onter (23%) an average of **25%** has been retained as a percentage of flights not flying at their requested flight level.

**Fuel savings associated
with the introduction of
Rnav routes (Phase II)****(CONTINUED)****Santiago - Lima - Los Angeles (TF6)**

City Pairs Routes	Conv. Dist	Rnav Dist	Regular FT	New FT	Flying time % Saving	Flight Level % Saving	Flights Total % fuel savings
Santiago - Mexico	3629	3551	453.63	443.88	2.15%	0.00%	2.15%
Lima - Mexico	2356	2284	294.50	285.50	3.06%	0.00%	3.06%
Lima - Los Angeles	3645	3621	455.63	452.63	0.66%	0.00%	0.66%

Note: 0% of flights were not operating at their requested flight level

Santiago - Lima - Miami (TF7)

City Pairs Routes	Conv. Dist	Rnav Dist	Regular FT	New FT	Flying time % Saving	Flight Level % Saving	Flights Total % fuel savings
Santiago - Miami	3653	3581	456.63	447.63	1.97%	0.44%	2.41%
Santiago - Bogota	2482	2296	310.25	287.00	7.49%	0.30%	7.79%
Lima - Miami	2320	2266	290.00	283.25	2.33%	0.28%	2.61%
Guayaqui - Miami	1696	1669	212.00	208.63	1.59%	0.20%	1.80%
Panama - Miami	2320	2266	290.00	283.25	2.33%	0.28%	2.61%

Note: 6% of flights were not operating at their requested flight level

Sao Paulo - Rio de Janeiro - Los Angeles (TF8)

City Pairs Routes	Conv. Dist	Rnav Dist	Regular FT	New FT	Flying time % Saving	Flight Level % Saving	Flights Total % fuel savings
Sao Paulo - Los Angeles	5484	5350	685.50	668.75	2.44%	0.66%	3.10%
Sao Paulo - Bogota	2403	2350	300.38	293.75	2.21%	0.29%	2.49%
Sao Paulo - Panama	2795	2736	349.38	342.00	2.11%	0.34%	2.45%
Sao Paulo - Mexico	4104	4008	513.00	501.00	2.34%	0.49%	2.83%
Panama - Los Angeles	2689	2619	336.13	327.38	2.60%	0.32%	2.93%

Note: 6% of flights were not operating at their requested flight level

Buenos Aires - Miami (TF12)

City Pairs Routes	Conv. Dist	Rnav Dist	Regular FT	New FT	Flying time % Saving	Flight Level % Saving	Flights Total % fuel savings
Buenos Aire - Bogota	2597	2534	324.63	316.75	2.43%	0.00%	2.43%
Buenos Aires - Miami	3926	3830	490.75	478.75	2.45%	0.00%	2.45%
Bogota - Miami	1330	1299	166.25	162.38	2.33%	0.00%	2.33%
Kingston - Miami	550	511	68.75	63.88	7.09%	0.00%	7.09%

Note: 5% of flights were not operating at their requested flight level

**Fuel savings associated
with the introduction of
Rnav routes (Phase II)** (CONTINUED)

Mexico - Dallas (TF15)

City Pairs Routes	Conv. Dist	Rnav Dist	Regular FT	New FT	Flying time % Saving	Flight Level % Saving	Flights Total % fuel savings
Mexico - Dallas	856	811	107.00	101.38	5.26%	0.26%	5.51%
Monterey - Dallas	471	453	58.88	56.63	3.82%	0.14%	3.96%

Note: 15% of flights were not operating at their requested flight level

Mexico - Miami (TF15)

City Pairs Routes	Conv. Dist	Rnav Dist	Regular FT	New FT	Flying time % Saving	Flight Level % Saving	Flights Total % fuel savings
Mexico - Miami	1137	1105	142.13	138.13	2.81%	0.00%	2.81%
Cancun - Miami	484	459	60.50	57.38	5.17%	0.00%	5.17%

Note: 0% of flights were not operating at their requested flight level

Mexico - Houston (TF15)

City Pairs Routes	Conv. Dist	Rnav Dist	Regular FT	New FT	Flying time % Saving	Flight Level % Saving	Flights Total % fuel savings
Mexico - Houston	679	661	84.88	82.63	2.65%	0.00%	2.65%

Note: 0% of flights were not operating at their requested flight level

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