



San Francisco
International
Airport

San Francisco International Airport



Benchmarking of airlines as incentive for
active noise abatement –
The San Francisco Fly Quiet Program

November 24, 2016



FLY QUIET PROGRAM

- ✦ SFO's Fly Quiet Program is a San Francisco International Airport/Community Roundtable initiative implemented by the Aircraft Noise Abatement Office.
- ✦ Its purpose is to encourage individual airlines to operate as quietly as possible at SFO.
- ✦ The program promotes a participatory approach in complying with noise abatement procedures and objectives by grading an airline's performance and by making the scores available to the public via newsletters, publications, and public meetings.



Elements and Categories

1. Fleet Noise Quality Rating
2. Noise Exceedance Rating
3. Nighttime Preferential Runway Use Rating
4. Shoreline Departure Rating
5. Gap Departure Rating
6. Foster City Arrival Rating



Evaluation & Concept Theory

- Difficult to establish fair criteria
- Compare apples to apples...
- Pilots can control these items



Fleet Noise Quality

- Awards points for quiet aircraft
- Compares fleet operated at SFO to national/world fleet mix

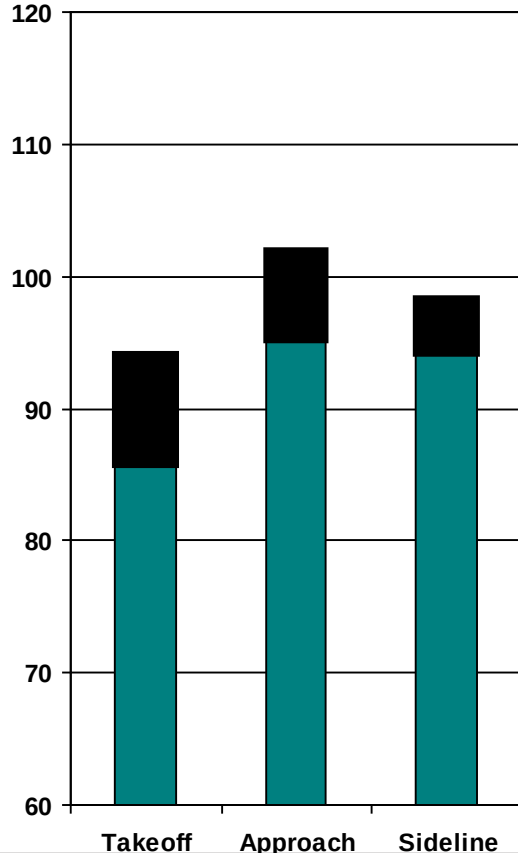




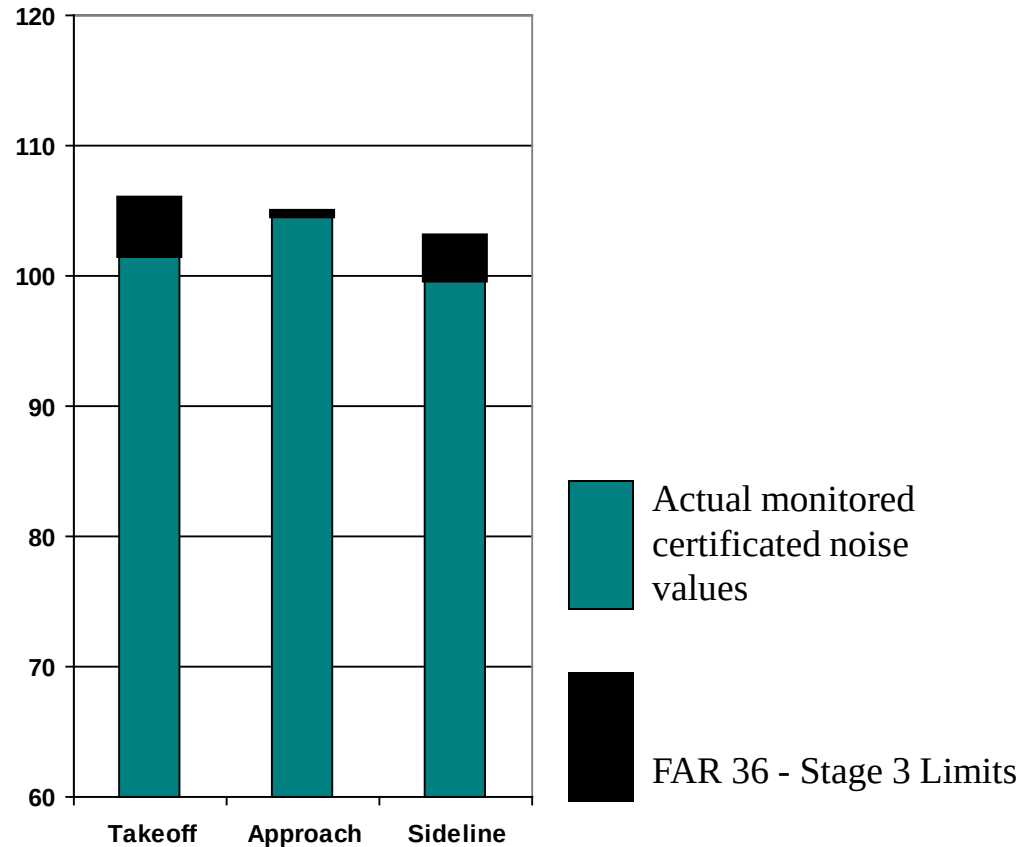
FNQ - Criteria & Calculations

FAR 36 Stage 3 Limits Vs. Certificated Noise Levels

B-757-200



B-747-400



Aircraft Certification Levels



Aircraft Type	FAR 36 Certification Level (EPNdB)			FAR 36 Certification Stage 3 Limit (EPNdB)			dB Below Stage 3 FAR 36 Certification			Total Weighted dB Below Limit
	Takeoff	Sdeline	Approach	Takeoff	Sdeline	Approach	Takeoff	Sdeline	Approach	
E145/R	79.	82.	92.	89.	94.	98.	9.2	11.	5.9	36.
MD90	84.	88.	91.	91.	96.	100.	7.4	8.0	8.7	31.
A34	96.	95.	97.	103.	101.	104.	7.8	6.1	7.7	29.
B752	85.	94.	95.	94.	98.	102.	8.4	4.3	6.8	27.
B717	82.	91.	91.	89.	95.	99.	7.7	4.2	7.9	27.
FK10	81.	91.	93.	89.	94.	98.	7.2	3.2	5.8	23.
A31	85.	91.	94.	91.	96.	100.	6.0	5.3	5.9	23.
DC87	95.	92.	98.	101.	99.	103.	5.3	6.8	4.8	22.
B764	91.	96.	98.	97.	100.	103.	6.1	3.7	5.2	21.
B73G	86.	89.	96.	91.	96.	100.	4.8	7.4	4.1	21.
B772	94.	96.	99.	99.	101.	105.	5.0	4.9	5.5	20.
B733	83.	90.	98.	90.	96.	100.	6.7	5.3	1.4	20.
B738	86.	91.	96.	91.	97.	100.	4.9	5.6	4.1	19.
B735	85.	89.	97.	90.	96.	100.	5.1	7.0	2.4	19.
MD11	95.	96.	104.	102.	101.	105.	6.6	5.7	0.6	19.
B734	86.	90.	97.	91.	96.	100.	4.7	5.8	2.5	17.
B762	91.	96.	98.	96.	100.	103.	4.9	3.1	4.8	17.
A32	86.	92.	96.	91.	96.	100.	4.8	3.9	3.9	17.
B739	86.	94.	96.	91.	97.	100.	5.1	2.8	4.3	17.
A32	88.	95.	95.	92.	97.	101.	4.6	2.4	5.5	17.
A31	90.	97.	100.	95.	99.	102.	5.0	2.2	2.7	14.
A30	91.	98.	100.	96.	99.	103.	4.9	1.4	3.4	14.
A33	95.	97.	98.	98.	101.	104.	2.4	3.5	6.3	14.
B763	92.	99.	100.	96.	100.	103.	4.6	1.2	3.4	13.
B744	101.	99.	104.	106.	103.	105.	4.4	3.3	0.3	12.
L101	98.	97.	101.	100.	100.	104.	2.4	2.7	2.6	10.
DC10	99.	97.	106.	101.	101.	104.	2.9	3.8	-1.6	8.1
MD80	91.	96.	93.	91.	96.	100.	-0.1	0.4	6.8	6.9
B743	102.	101.	106.	105.	102.	105.	3.5	1.5	-1.6	6.8
B742	103.	103.	106.	105.	102.	105.	1.8	-0.5	-1.0	2.2
DC86	100.	101.	100.	100.	99.	103.	0.3	-1.6	2.4	1.4
B741	104.	102.	105.	105.	102.	105.	0.9	-0.3	-0.3	1.1
B72Q	97.	95.	98.	97.	97.	101.	-2.0	1.6	2.6	0.2
B73Q	90.	97.	95.	89.	95.	99.	-1.1	-2.0	3.6	-0.5
DC9Q	90.	97.	96.	89.	95.	99.	-1.1	-2.0	3.2	-0.8

Airport

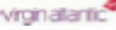
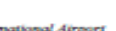
B757 Aircraft	Takeoff (EPNdB)	Approach (EPNdB)	Sideline (EPNdB)	Total
FAR 36 Stage 3 Limit	94.1	102.0	98.4	--
Certificated Noise Level	85.7	95.2	94.1	--
Difference	8.4	6.8	4.3	--
Weight Adjustment	X2	X1	X1	--
Total Difference	16.8	6.8	4.3	27.9

Airline Operations	Average Daily Flights	Aircraft FNQ Rating	Calculation	Airline FNQ Rating
B757	30	27.9	$30 \times 27.9 = 837$	--
MD80	50	6.9	$40 \times 6.9 = 276$	--
Total	80	--	1113/80	13.91



Fleet Noise Quality - 3rd Quarter 2016

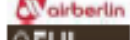
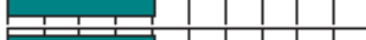
July 1 to September 30, 2016

Airline	Nationwide Fleet Noise Quality Rating	San Francisco		Score	Fleet Noise Quality Rating
		Average Daily Jet Operations			
 NCA	NCA	3.90	1	10.00	
 UAE	UAE	7.89	1	10.00	
 CPZ	CPZ	10.00	9	10.00	
 SKW	SKW	10.00	82	10.00	
 KAL	KAL	4.05	2	9.89	
 CSN	CSN	5.64	1	9.50	
 CCA	CCA	3.46	1	9.23	
 DLH	DLH	6.09	2	9.09	
 VIR	VIR	5.84	2	8.99	
 AFR	AFR	5.49	2	8.36	
 SAS	SAS	4.96	1	8.17	
 SWR	SWR	5.17	2	8.17	
 BAW	BAW	4.34	2	7.93	
 PAL	PAL	5.09	1	7.41	
 ANA	ANA	5.43	1	7.15	
 CPA	CPA	4.18	2	7.15	
 ETD	ETD	0.00	1	7.15	
 JAL	JAL	4.20	1	7.15	
 SLA	SLA	5.93	2	7.15	
 THY	THY	6.80	1	7.15	
 AIC	AIC	4.77	0	7.15	
 EVA	EVA	5.05	2	6.85	
 CES	CES	4.63	1	6.68	
 ANZ	ANZ	4.00	1	6.55	
				6.37	SFO AVERAGE
 DAL	DAL	4.92	41	6.33	
 AMX	AMX	5.54	3	5.83	
 CMP	CMP	6.46	1	5.83	
 SCX	SCX	5.82	2	5.83	
 WJA	WJA	5.82	2	5.83	
 UAL	UAL	5.83	192	5.80	
 SWA	SWA	5.70	44	5.73	
 FFT	FFT	6.41	8	5.64	
 CAL	CAL	3.62	2	5.64	
 ACA	ACA	6.75	13	5.38	
 ASA	ASA	5.10	17	5.35	

SFO

Fleet Noise Quality - 3rd Quarter 2016

July 1 to September 30, 2016

Airline	Nationwide Fleet Noise Quality Rating	San Francisco		Fleet Noise Quality Rating
		Average Daily Jet Operations	Score	
 AAL	3.94	46	5.17	
 KLM	4.67	1	4.98	
 VRD	5.31	59	4.96	
 AAR	3.93	1	4.95	
 TAI	5.18	1	4.94	
 GTI	0.93	1	4.87	
 VOI	0.00	2	4.86	
 JBU	6.13	16	4.79	
 EIN	4.05	1	4.05	
 WOW	0.00	1	4.05	
 XLF	4.05	0	4.05	
 BER	5.92	1	4.05	
 FJI	0.00	0	4.05	
 HAL	6.21	2	4.05	
 FDX	2.80	1	3.61	
 PAC	3.43	0	3.43	
 QFA	3.47	1	3.43	
 CKS	0.60	0	3.14	
AVERAGE	4.71	11	6.37	



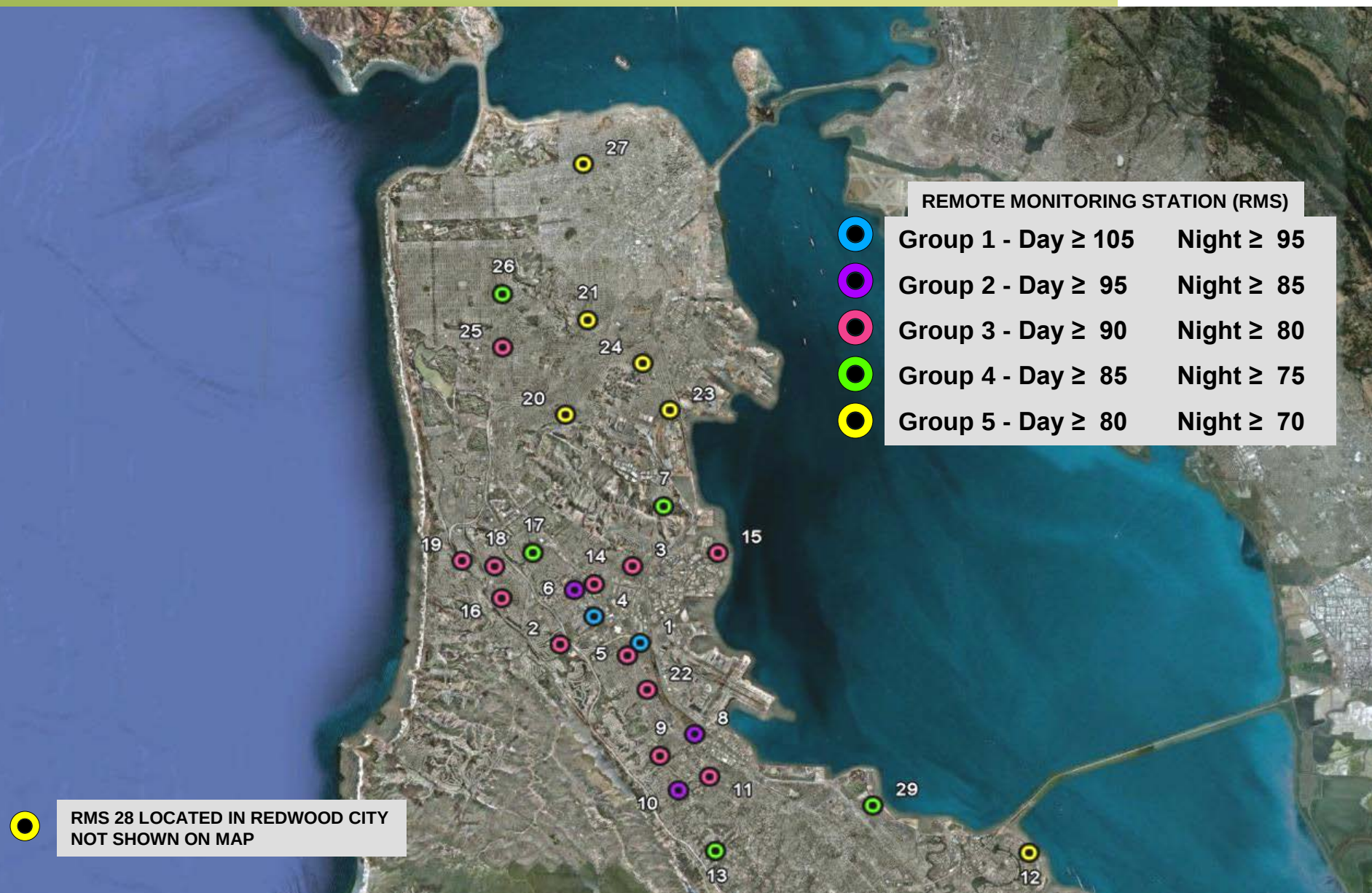
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Noise Exceedance Rating

- Measures noise at each of 29 remote monitoring sites
- How often do they cause an exceedance?
- Set maximum decibel levels at all noise monitoring sites



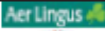
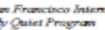
Monitor Locations



					Criteria A-weighted dB	
		Group No.	Site Location	NMS	Daytime (0700-2200)	Nighttime (2200-0700)
High	Lmax	1	San Bruno	1	≥105	≥95
		1	South San Francisco	4	≥105	≥95
		2	South San Francisco	6	≥95	≥85
		2	Millbrae	8	≥95	≥85
		2	Burlingame	10	≥95	≥85
		3	San Bruno	2	≥90	≥80
		3	South San Francisco	3	≥90	≥80
		3	San Bruno	5	≥90	≥80
		3	Millbrae	9	≥90	≥80
		3	Burlingame	11	≥90	≥80
		3	South San Francisco	15	≥90	≥80
		3	South San Francisco	16	≥90	≥80
		3	Daly City	18	≥90	≥80
		3	Pacifica	19	≥90	≥80
		3	San Bruno	22	≥90	≥80
		3	San Francisco	25	≥90	≥80
		4	Brisbane	7	≥85	≥75
		4	Hillsborough	13	≥85	≥75
		4	South San Francisco	14	≥85	≥75
		4	South San Francisco	17	≥85	≥75
		4	San Francisco	26	≥85	≥75
		4	San Mateo	29	≥85	≥75
		5	Foster City	12	≥80	≥70
		5	Daly City	20	≥80	≥70
		5	San Francisco	21	≥80	≥70
		5	San Francisco	23	≥80	≥70
	↓	5	San Francisco	24	≥80	≥70
		5	San Francisco	27	≥80	≥70
Low	Lmax	5	Redwood City	28	≥80	≥70

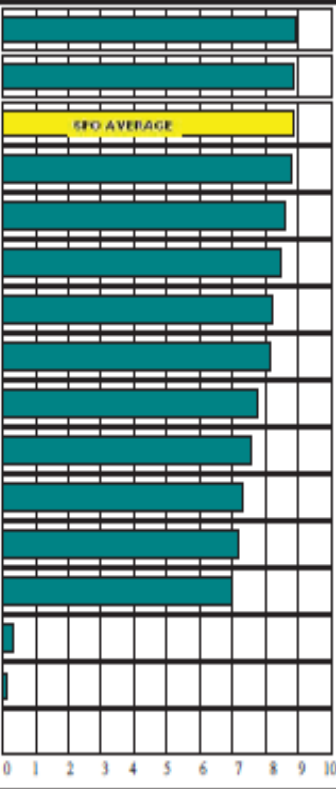
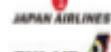
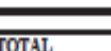
Noise Exceedance Rating Report - 3rd Quarter 2016

July 1 to September 30, 2016

Airline	Noise Exceedances				Noise Exceedance Quality Rating
	Total Noise Exceedances	Total Quarterly Operations	Exceedances per 1000 Operations	Score	
 EIN	0	183	0	10.00	
 UAE	0	184	0	10.00	
 CES	1	186	5	9.98	
 DLH	2	367	5	9.98	
 BAW	2	365	5	9.98	
 SAS	1	182	5	9.98	
 THY	1	176	6	9.98	
 SKW	124	18,872	7	9.97	
 BER	1	132	8	9.97	
 KLM	2	233	9	9.97	
 VIR	3	338	9	9.96	
 SWR	3	331	9	9.96	
 CSN	2	183	11	9.96	
 SCX	7	457	15	9.94	
 VRD	167	10,887	15	9.94	
 WOW	2	127	16	9.94	
 ANA	3	183	16	9.93	
 ACA	40	2,389	17	9.93	
 DAL	142	7,462	19	9.92	
 CPZ	53	2,684	20	9.92	
 AFR	9	343	26	9.89	
 FFT	42	1,486	28	9.89	
 SWA	251	8,173	31	9.88	
 ASA	103	3,217	32	9.87	
 JBU	105	2,925	36	9.85	
 UAL	1,380	35,405	39	9.84	
 AAL	340	8,530	40	9.84	
 XLF	3	67	45	9.82	
 ETD	11	185	59	9.76	
 WJA	37	367	101	9.59	
 OCA	30	252	119	9.52	
 VOI	33	277	119	9.52	
 HAL	46	366	126	9.49	
 TAI	38	274	139	9.44	
 AMX	85	567	150	9.39	
 FDX	46	257	179	9.28	
 CMP	38	184	207	9.16	
NCA	36	159	226	9.08	

Noise Exceedance Rating Report - 3rd Quarter 2016

July 1 to September 30, 2016

Airline	Noise Exceedances				Noise Exceedance Quality Rating
	Total Noise Exceedances	Total Quarterly Operations	Exceedances per 1000 Operations	Score	
 GTI	73	265	275	8.89	
 SIA	103	365	282	8.86	
				8.86	
 CAL	93	304	306	8.76	
 AIC	27	78	346	8.60	
 JAL	70	184	380	8.46	
 EVA	174	396	439	8.22	
 CPA	199	428	465	8.12	
 FJI	15	27	556	7.75	
 ANZ	106	174	609	7.53	
 AAR	177	268	660	7.33	
 KAL	261	370	705	7.15	
 PAL	175	236	742	7.00	
 PAC	55	23	2391	0.32	
 CKS	144	59	2441	0.12	
 QFA	388	157	2471	0.00	
TOTAL					5,249
					112,289
SFO AVERAGE					282
					8.86

Nighttime Preferential Runway Use

- **Depart over water between 1:00 - 6:00 AM**
- **Depart over land and turn over water**
- **Depart and climb over land**



Nighttime Preferential Runway Use



Between
1am and 6am

- Runways 10L/R +3 points
- Runways 28L/R with Shoreline departure +2 points
- Runways 01L/R +1 points
- Runways 28L/R with Straight-out departure +0 points

Nighttime Preferential Runway Use - 3rd Quarter 2016

July 1 to September 30, 2016

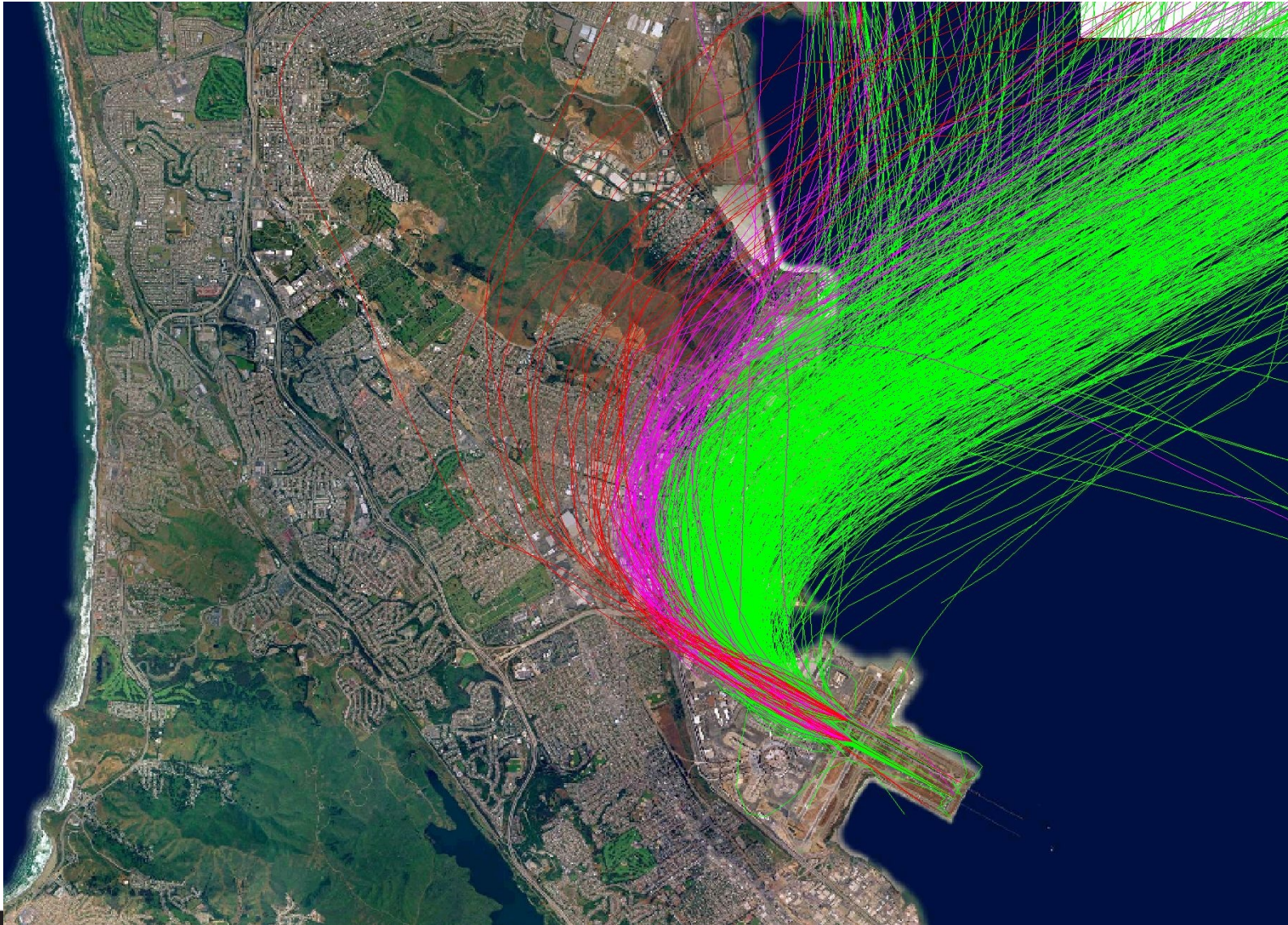
Airline	Nighttime Departures (1:00 am to 6:00 am)						Nighttime Runway Use Rating
	Total	10L/R	28L/R Shoreline	01L/R	28L/R Straight	Score	
 ASA	1	100%	0%	0%	0%	10.00	
 ACA	3	0%	67%	33%	0%	5.56	
 FFT	31	10%	16%	74%	0%	4.52	
 AAL	188	4%	18%	77%	2%	4.15	
 GTI	5	0%	60%	0%	40%	4.00	
 UAL	233	3%	8%	81%	9%	3.48	
 DAL	74	0%	1%	99%	0%	3.38	
 JBU	11	0%	9%	82%	9%	3.33	
 SCX	2	0%	0%	100%	0%	3.33	
 SWA	90	0%	0%	100%	0%	3.33	
 SKW	15	0%	13%	73%	13%	3.33	
 VOI	138	7%	0%	74%	19%	3.19	
 TAI	92	7%	0%	73%	21%	3.08	
 AMX	34	9%	0%	53%	38%	2.65	
 PAC	12	25%	0%	0%	75%	2.50	
						2.28	
 AAR	33	18%	0%	0%	82%	1.82	
 KAL	89	8%	0%	0%	92%	0.79	
 EVA	128	8%	0%	0%	92%	0.78	
 CKS	23	4%	4%	0%	91%	0.72	
 CAL	88	6%	0%	0%	94%	0.57	
 JAL	90	4%	0%	3%	92%	0.56	
 PAL	26	4%	0%	0%	96%	0.38	
 SIA	89	3%	0%	0%	97%	0.34	
 CCA	34	3%	0%	0%	97%	0.29	
 CPA	116	1%	0%	0%	99%	0.09	
 CSN	5	0%	0%	0%	100%	0.00	
 FJI	1	0%	0%	0%	100%	0.00	
 NCA	1	0%	0%	0%	100%	0.00	
 QFA	1	0%	0%	0%	100%	0.00	
TOTAL	1,653						
SFO AVERAGE		8%	7%	32%	54%	2.28	

Shoreline Departure

- **Noise Abatement Procedure for Rwy 28**
- **Keep aircraft east of Highway 101**
- **Visual procedure**

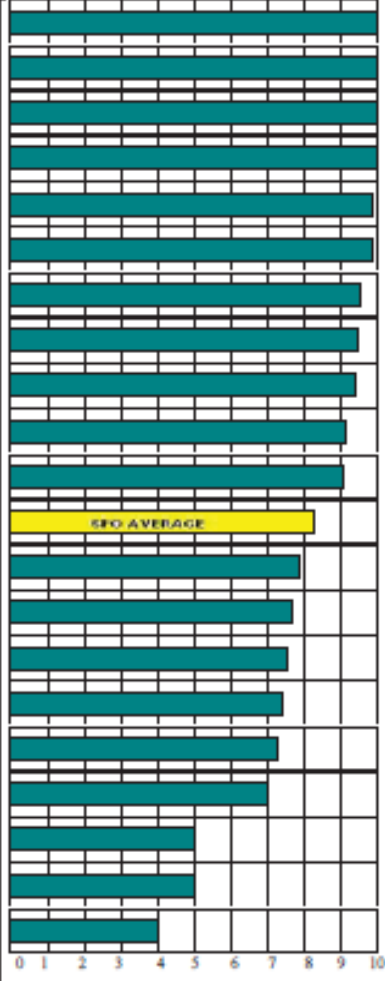






Shoreline Departure Rating - 3rd Quarter 2016

July 1 to September 30, 2016

Airline		Shoreline Departures					Shoreline Departure Rating	
		Total	Successful	Marginal	Poor	Score		
	CKS	1	100%	0%	0%	10.00		
	CPZ	18	100%	0%	0%	10.00		
	SCX	15	100%	0%	0%	10.00		
	WJA	5	100%	0%	0%	10.00		
	SWA	32	97%	3%	0%	9.84		
	SKW	136	96%	4%	0%	9.82		
	ASA	41	90%	10%	0%	9.51		
	FFT	26	88%	12%	0%	9.42		
	VRD	103	88%	11%	1%	9.37		
	FDX	11	82%	18%	0%	9.09		
	ACA	32	81%	19%	0%	9.06		
						8.24		SFO AVERAGE
	DAL	87	63%	31%	6%	7.87		
	JBU	32	53%	47%	0%	7.66		
	DLH	2	50%	50%	0%	7.50		
	AAL	137	53%	43%	4%	7.41		
	UAL	390	58%	29%	13%	7.27		
	GTI	10	40%	60%	0%	7.00		
	BER	2	0%	100%	0%	5.00		
	XLF	1	0%	100%	0%	5.00		
	KLM	5	20%	40%	40%	4.00		
TOTAL		1,086						
SFO AVERAGE			68%	29%	3%	8.24		

Gap Departure Rating

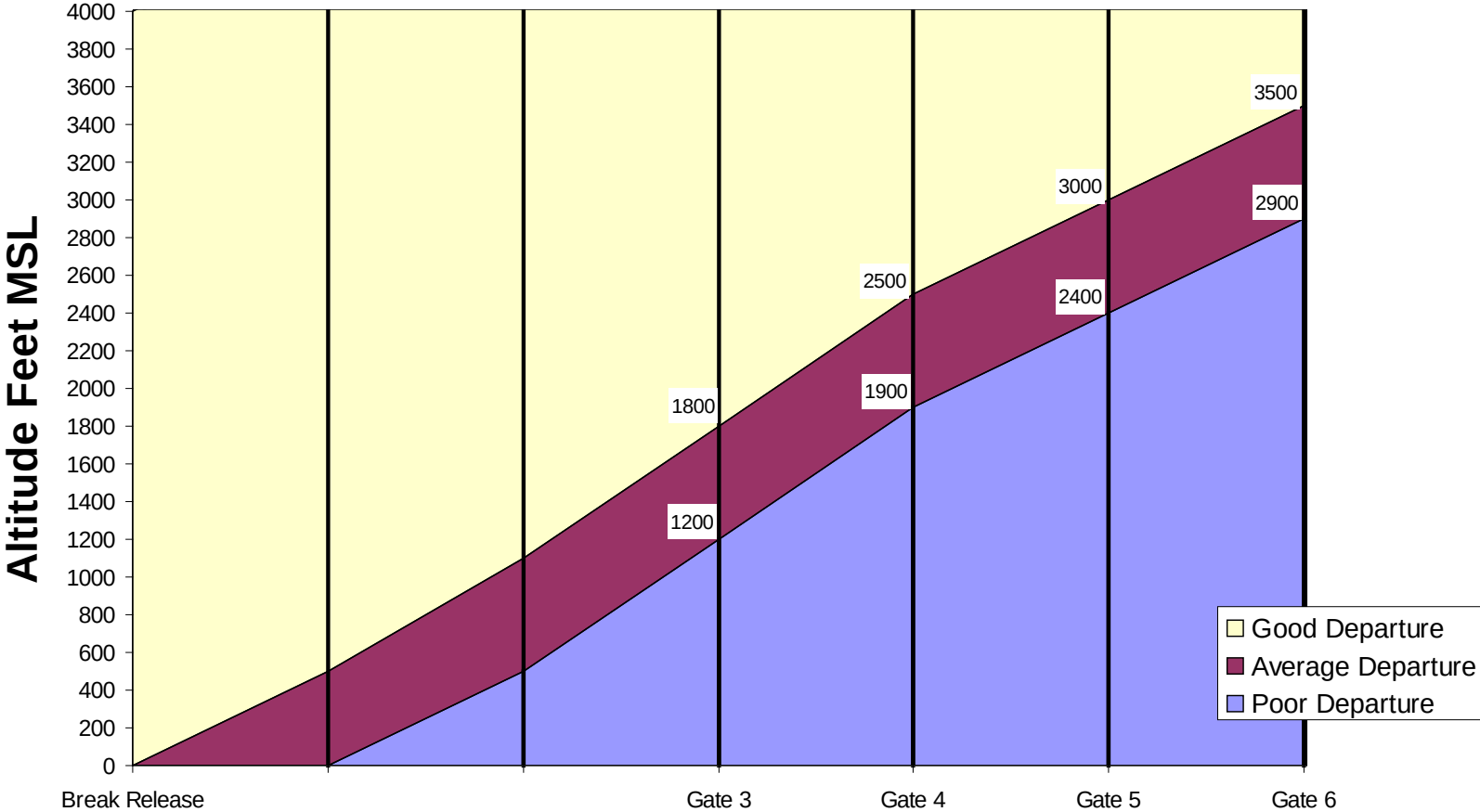
- Higher is Better
- Compare similar aircraft on similar routes
- Criteria based on historical data



Gap Departure Rating



Altitude Depiction of Gap Departure Criteria 747- 400 Domestic



Gap Departure Climb Rating - 3rd Quarter 2016

July 1 to September 30, 2016

Airline		Gap Departures		Gap Departure Quality Rating			
		Total	Score				
 VOI	VOI	26	9.13				
 AAR	AAR	127	8.14				
 XLF	XLF	16	7.89				
 AIC	AIC	40	7.19				
 GTI	GTI	32	7.07				
 JAL	JAL	83	6.99				
 AMX	AMX	22	6.76				
 CSN	CSN	90	6.54				
 VIR	VIR	109	6.51				
 WOW	WOW	36	6.46				
 CPA	CPA	211	6.45				
 DAL	DAL	123	6.28				
 CCA	CCA	124	6.26				
 ANA	ANA	91	5.99				
 ANZ	ANZ	87	5.82				
 SWA	SWA	142	5.82				
 DLH	DLH	178	5.63				
 NCA	NCA	79	5.59				
 QFA	QFA	77	5.58				
 CPZ	CPZ	47	5.51				
 ETD	ETD	91	5.26				
 FJI	FJI	14	5.18				
ASA	ASA	43	5.00				
KLM	KLM	16	4.92				
			4.91	SFO AVERAGE			
CAL	CAL	145	4.89				
TAI	TAI	19	4.80				
JBU	JBU	33	4.77				
SKW	SKW	233	4.73				
KAL	KAL	175	4.71				
FFT	FFT	20	4.69				
AFR	AFR	158	4.64				
SAS	SAS	90	4.47				
UAL	UAL	3309	4.38				
FDX	FDX	9	4.31				

Gap Departure Climb Rating - 3rd Quarter 2016

July 1 to September 30, 2016

Airline	Gap Departures		Gap Departure Quality Rating
	Total	Score	
 AIR CANADA ACA	13	4.23	
 HAWAIIAN HAL	13	4.04	
 EVA AIR EVA	185	4.03	
 BRITISH AIRWAYS BAW	143	3.96	
 SWISS SWR	164	3.82	
 CHINA EASTERN CES	92	3.67	
 VIRGIN AMERICA VRD	358	3.44	
 COPA AIRLINES CMP	92	3.25	
 SINGAPORE AIRLINES SIA	179	3.23	
 PHILIPPINE AIRLINES PAL	117	3.00	
 PACIFIC AIR LINES PAC	9	2.92	
 EMIRATES UAE	92	2.83	
 TURKISH AIRLINES THY	86	2.12	
 AMERICAN AIRLINES AAL	349	2.12	
 AER LINGUS EIN	91	2.03	
 KALITTA AIR CKS	26	1.92	
 AIRBERLIN BER	47	1.44	
TOTAL		8151	
SFO Average		4.91	

Foster City Fly Quiet Rating



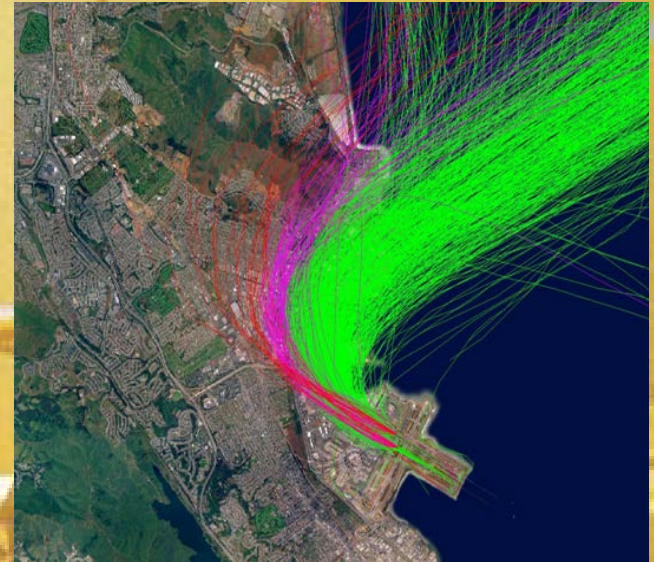
Overview

- Scoring system
- Position of gates
- Sample Scores

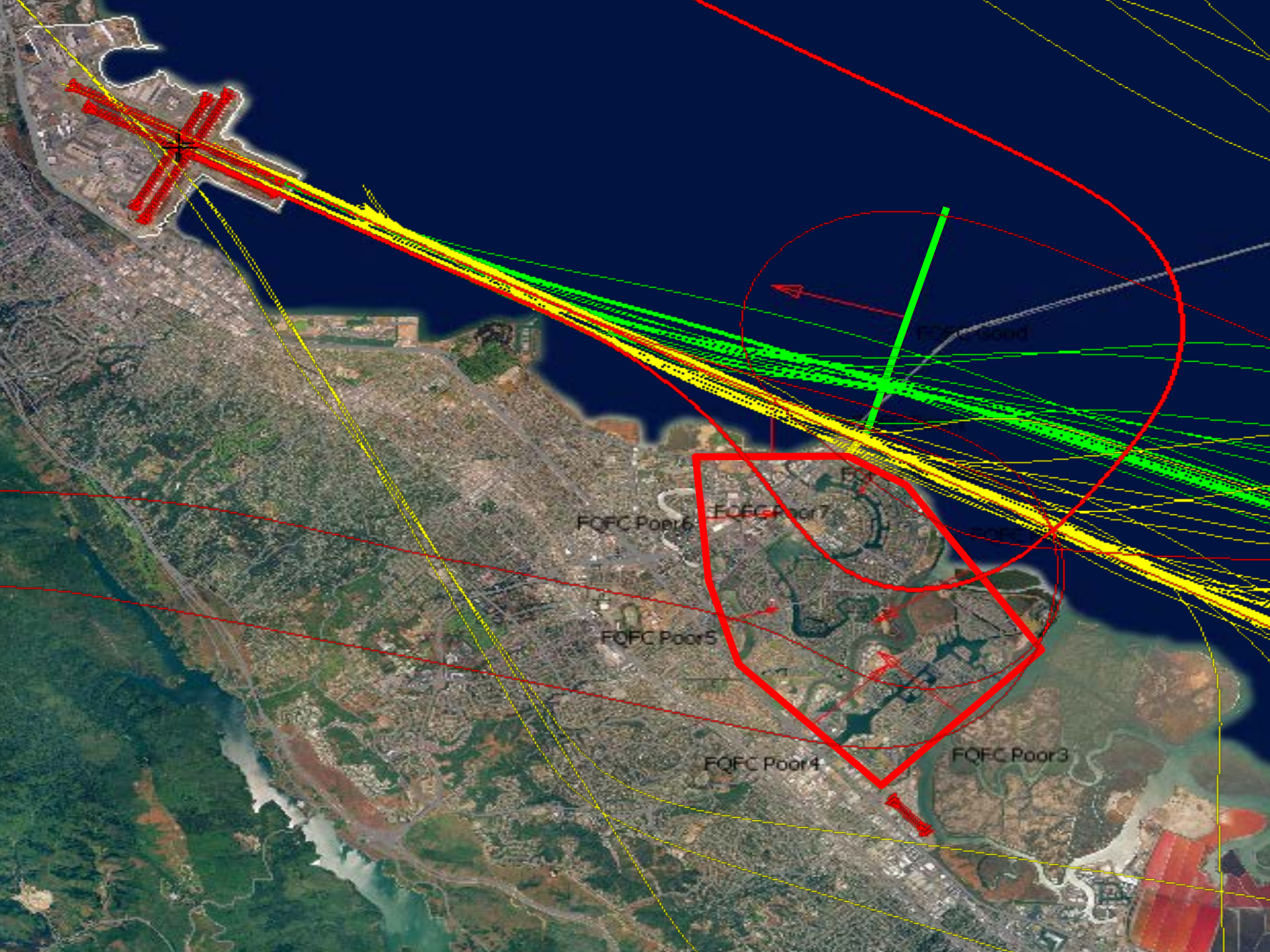
Foster City Fly Quiet Rating

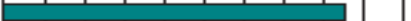
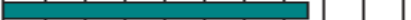
Scoring System

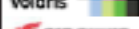
- Followed the same scoring criteria as the Shoreline Departures
 - 2 points for a good arrival
 - 1 point for a marginal arrival
 - 0 for a poor arrival
 - Limited to airlines arriving between 11 p.m. and 6 a.m.
 - Limited to 28L/R arrivals
 - Limited to Jets







Airline	Foster City Arrivals					Foster City Arrival Rating
	Total	Successful	Marginal	Poor	Score	
 SCX	1	100%	0%	0%	10.00	
 ACA	122	70%	30%	0%	8.52	
 FFT	145	59%	41%	0%	7.93	
 JBU	235	58%	41%	1%	7.83	
 DAL	364	53%	47%	1%	7.61	
 AAL	669	45%	54%	1%	7.21	
 SWA	282	45%	50%	4%	7.06	
 UAL	1,470	33%	65%	2%	6.55	
 VRD	179	26%	74%	0%	6.28	
 FDX	63	19%	81%	0%	5.95	
					5.93	
 AMX	33	18%	82%	0%	5.91	
 GTI	30	17%	83%	0%	5.83	
 CKS	27	7%	93%	0%	5.37	
 TAI	91	5%	92%	2%	5.16	
 AAR	35	3%	97%	0%	5.14	
 VOI	137	1%	99%	0%	5.07	
 KAL	87	2%	97%	1%	5.06	
 CAL	2	0%	100%	0%	5.00	
 CPA	5	0%	100%	0%	5.00	
 CPZ	22	0%	100%	0%	5.00	
 EVA	8	0%	100%	0%	5.00	
 HAL	3	0%	100%	0%	5.00	
 NCA	1	0%	100%	0%	5.00	
 PAC	11	0%	100%	0%	5.00	
 PAL	3	0%	100%	0%	5.00	
 SIA	1	0%	100%	0%	5.00	
 WJA	4	0%	100%	0%	5.00	
 SKW	134	7%	84%	10%	4.85	
 ASA	32	3%	88%	9%	4.69	
TOTAL	4,196					
SFO AVERAGE		20%	79%	1%	5.93	

Airline		Fleet Noise Quality	Noise Exceedance	Nighttime Runway Use	Departures Shoreline Gap	Arrivals Foster City	Final Score	Airline Fly Quiet Rating		
 VIR		8.99	9.96	-	-	6.51	-	8.49		
 CPZ		10.00	9.92	-	10.00	5.51	5.00	8.09		
 DLH		9.09	9.98	-	7.50	5.63	-	8.05		
 SCX		5.82	9.94	3.33	10.00	-	10.00	7.82		
 ANA		7.15	9.93	-	-	5.99	-	7.69		
 AIC		7.15	8.60	-	-	7.19	-	7.64		
 AFR		8.36	9.89	-	-	4.64	-	7.63		
 UAE		10.00	10.00	-	-	2.83	-	7.61		
 WJA		5.82	9.59	-	10.00	-	5.00	7.60		
 SAS		8.17	9.98	-	-	4.47	-	7.54		
 ASA		5.35	9.87	10.00	9.51	5.00	4.69	7.40		
 ETD		7.15	9.76	-	-	5.26	-	7.39		
 SWR		8.17	9.96	-	-	3.82	-	7.32		
 BAW		7.93	9.98	-	-	3.96	-	7.29		
 SKW		10.00	9.97	3.33	9.82	4.73	4.85	7.12		
 ACA		5.38	9.93	5.56	9.06	4.23	8.52	7.11		
 FFT		5.64	9.89	4.52	9.42	4.69	7.93	7.01		
 SWA		5.73	9.88	3.33	9.84	5.82	7.06	6.94		
 DAL		6.33	9.92	3.38	7.87	6.28	7.61	6.90		
 WOW		4.05	9.94	-	-	6.46	-	6.81		
 VED		4.96	9.94	-	9.37	3.44	6.28	6.80		
 CES		6.68	9.98	-	-	3.67	-	6.78		
 XLF		4.05	9.82	-	5.00	7.89	-	6.69		
 ANZ		6.55	7.53	-	-	5.82	-	6.63		
 CSN		9.50	9.96	0.00	-	6.54	-	6.50		
 FDX		3.61	9.28	-	9.09	4.31	5.95	6.45		
 THY		7.15	9.98	-	-	2.12	-	6.42		
 JBU		4.79	9.85	3.33	7.66	4.77	7.83	6.37		
 VOI		4.86	9.52	3.19	-	9.13	5.07	6.35		
 CCA		9.23	9.52	0.29	-	6.26	-	6.33		
								6.29		
								SFO AVERAGE		
 GTI		4.87	8.89	4.00	7.00	7.07	5.83	6.28		
 UAL		5.80	9.84	3.48	7.27	4.38	6.55	6.22		
 AMX		5.82	9.39	2.65	-	6.76	5.91	6.11		
 CMP		5.82	9.16	-	-	3.25	-	6.08		
 AAL		5.17	9.84	4.15	7.41	2.12	7.21	5.98		
 KLM		4.98	9.97	-	4.00	4.92	-	5.97		
 NCA		10.00	9.08	0.00	-	5.59	5.00	5.93		
 JAL		7.15	8.46	0.56	-	6.99	-	5.79		

Airline Fly Quiet Summary Report - 3rd Quarter 2016

July 1 to September 30, 2016

Airline		Fleet Noise Quality	Noise Exceedance	Nighttime Runway Use	Departures Shoreline Gap	Arrivals Foster City	Final Score	Airline Fly Quiet Rating												
	HAL	4.05	9.49	-	-	4.04	5.00	5.64												
	KAL	9.89	7.15	0.79	-	4.71	5.06	5.52												
	TAI	4.94	9.44	3.08	-	4.80	5.16	5.49												
	AAR	4.95	7.33	1.82	-	8.14	5.14	5.47												
	ETN	4.05	10.00	-	-	2.03	-	5.36												
	CPA	7.15	8.12	0.09	-	6.45	5.00	5.36												
	BER	4.05	9.97	-	5.00	1.44	-	5.11												
	EVA	6.85	8.22	0.78	-	4.03	5.00	4.98												
	CAL	5.64	8.76	0.57	-	4.89	5.00	4.97												
	SIA	7.15	8.86	0.34	-	3.23	5.00	4.92												
	PAL	7.41	7.00	0.38	-	3.00	5.00	4.56												
	FJI	4.05	7.75	0.00	-	5.18	-	4.24												
	CKS	3.14	0.12	0.72	10.00	1.92	5.37	3.55												
	PAC	3.43	0.32	2.50	-	2.92	5.00	2.83												
	QFA	3.43	0.00	0.00	-	5.58	-	2.25												
SFO Average		6.37	8.86	2.28	8.24	4.91	5.93	6.29												

Publicity

- The final ingredient
- Roundtable press releases
- Transparency - the public views all of the scores
- Video - [The SFO Fly Quiet Program - You Tube](#)



Awards

Annual Jon C. Long Fly Quiet Awards acknowledge good performance

- **Quietest Flying Airline**
- **Most Improved Airline**
- **Chairman's Award**



The Results

- Airlines responded favorably
- Want to improve
- Scores going up--noise going down





San Francisco
International
Airport

Thank you!





Fly Quiet Report

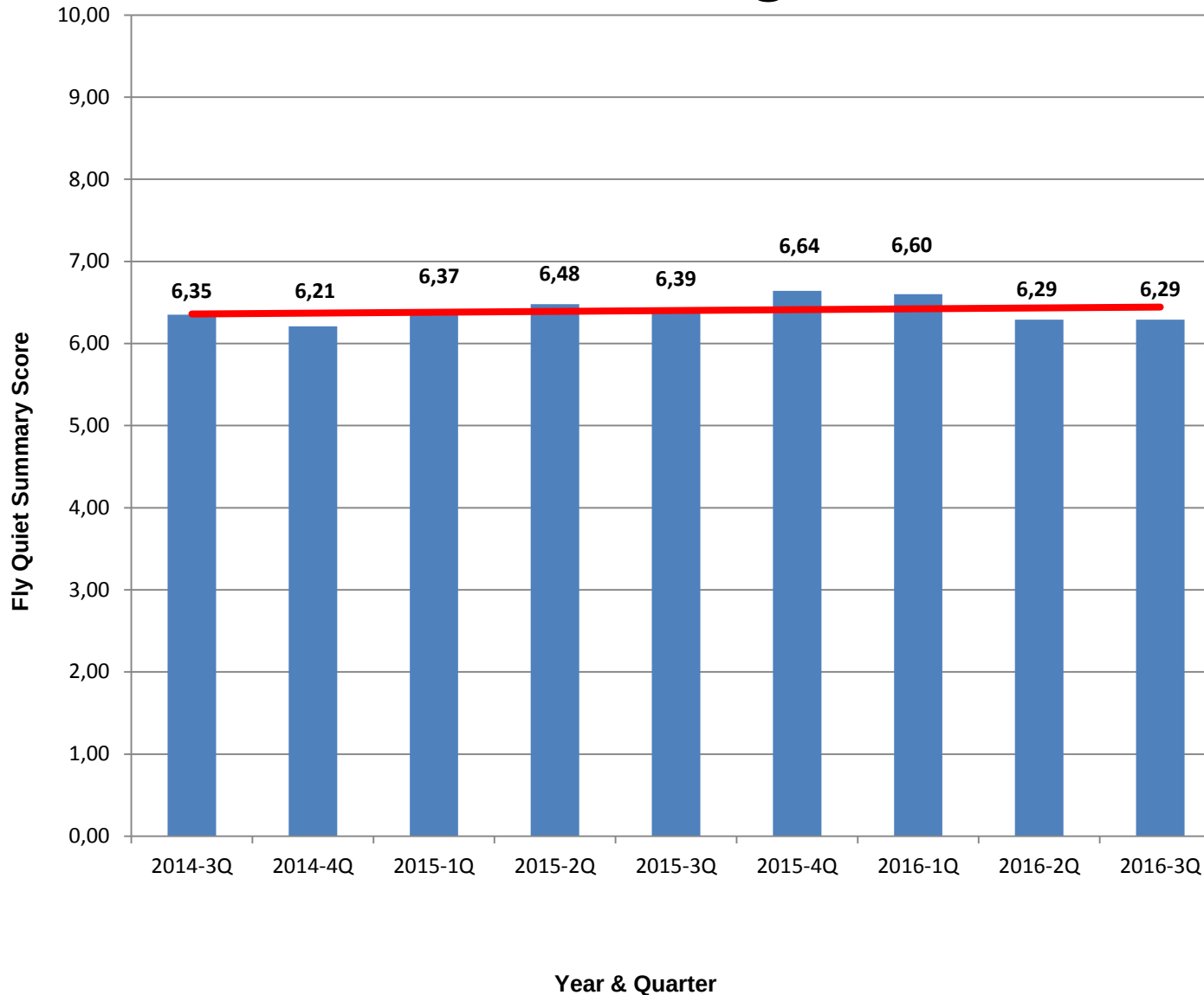
Presented at the November 2, 2016
Airport Community Roundtable Meeting
Aircraft Noise Abatement Office
Third Quarter 2016



San Francisco
International
Airport

Fly Quiet Summary Averages

Averages



Top 5

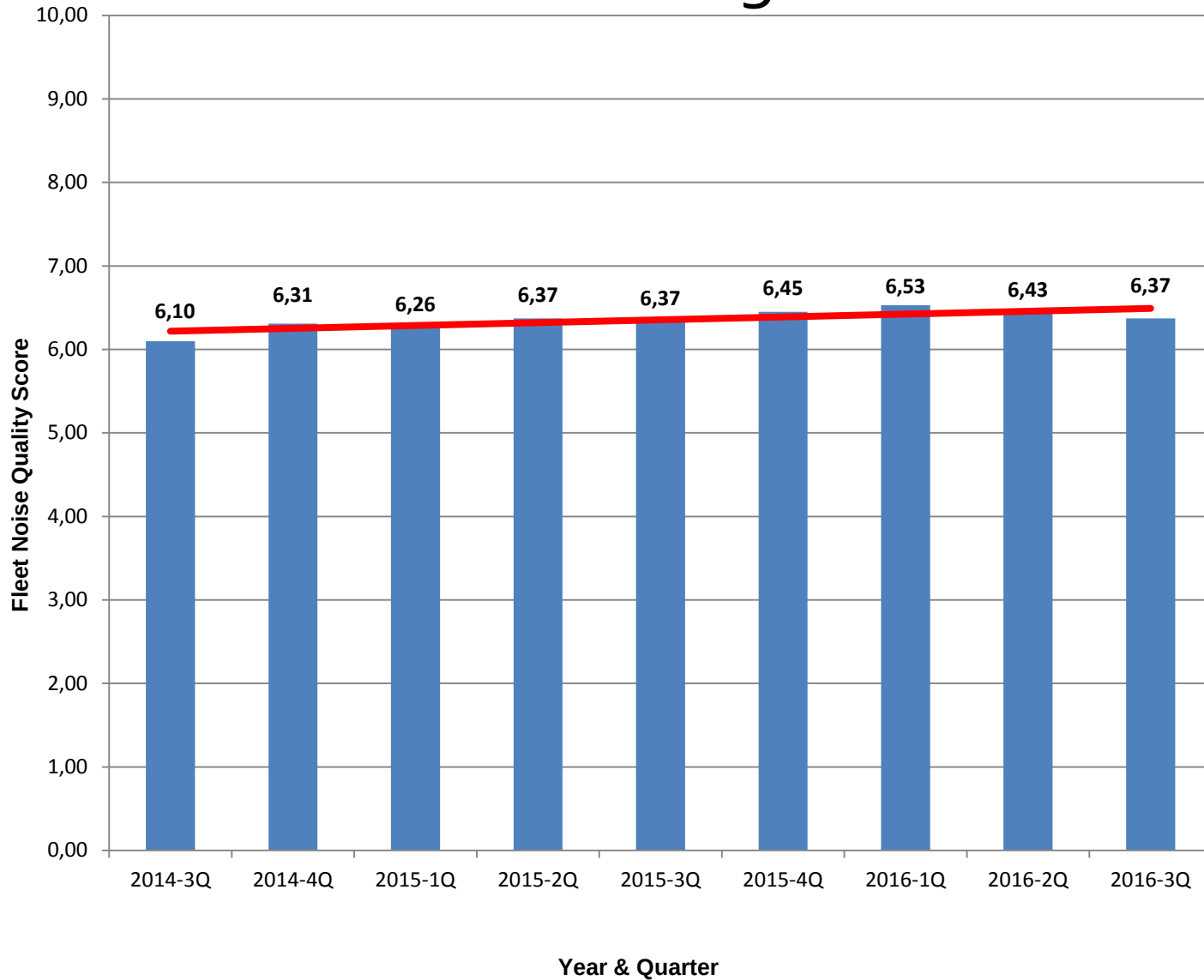


Bottom 5



Fleet Noise Quality Averages

Averages



Top 5

NCA
Nippon Cargo Airlines

KOREAN AIR

中国南方航空
CHINA SOUTHERN AIRLINES

AIR CHINA

Lufthansa

Bottom 5

jetBlue

wow
air

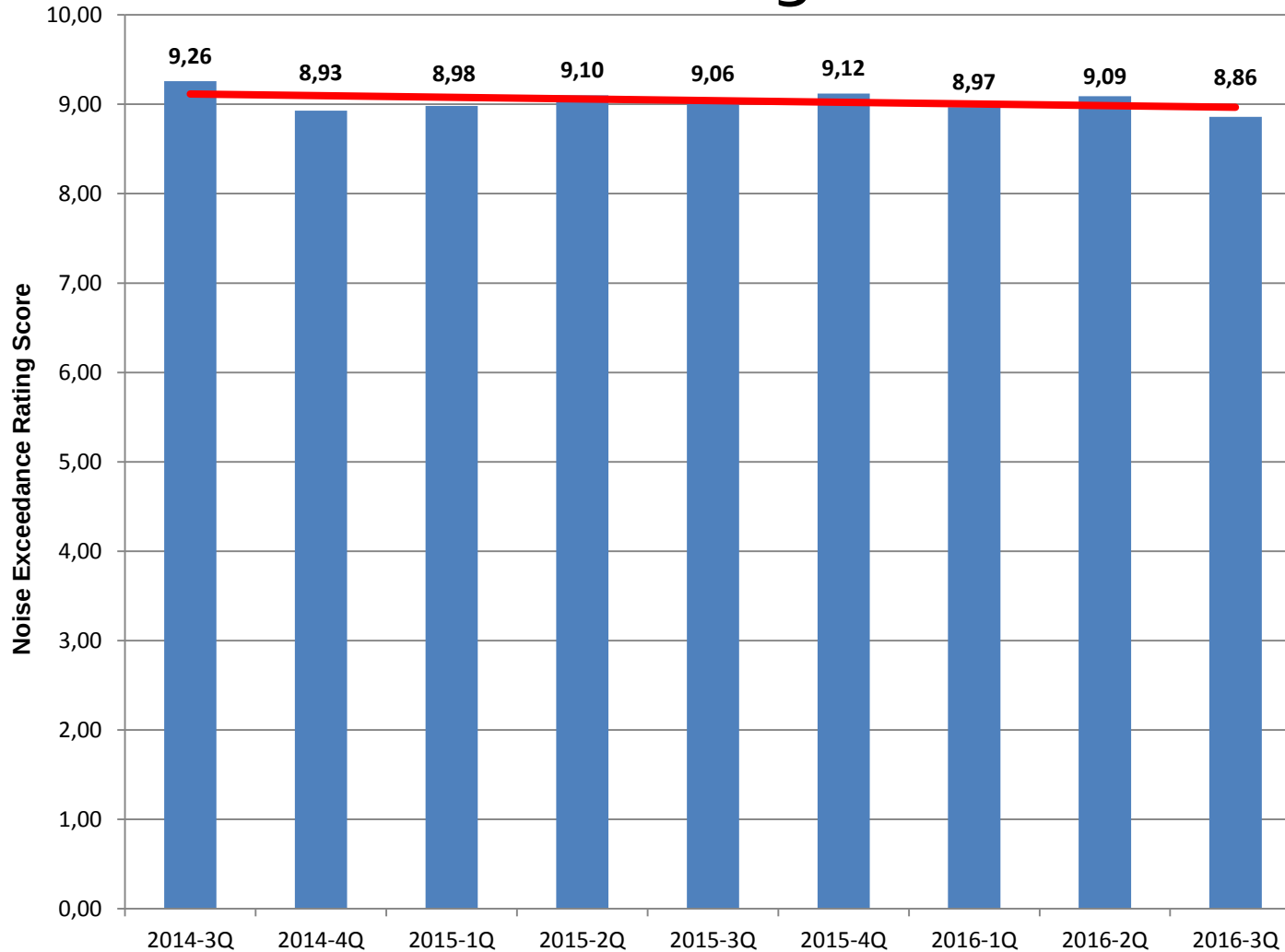
FedEx

QANTAS

KALITAE
AIR

— Average of Quarterly Averages, Airline Rankings are for top 5 and bottom 5 performers for this category for current quarter, new airlines to top and bottom 5

Noise Exceedance Rating Averages



Top 5

Aer Lingus

Lufthansa

KLM Royal Dutch Airlines

virgin atlantic

Virgin America



Bottom 5

KOREAN AIR

Philippines

POLAR AIR CARGO

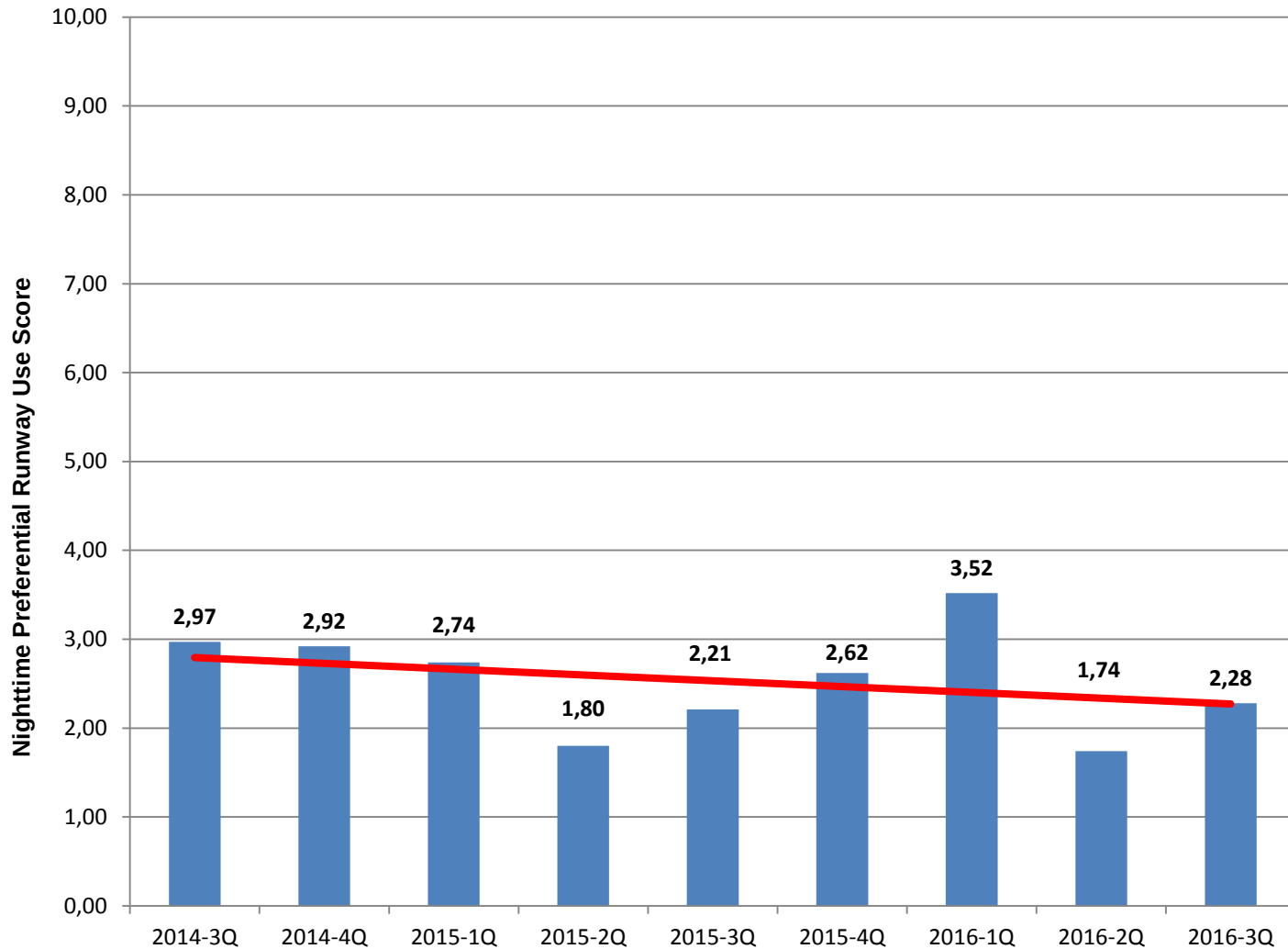
KALITTA AIR

QANTAS

Year & Quarter

— Average of Quarterly Averages, Airline Rankings are for top 5 and bottom 5 performers for this category for current quarter, new airlines to top and bottom 5

Nighttime Preferential Runway Use Averages



Year & Quarter

— Average of Quarterly Averages, Airline Rankings are for top 5 and bottom 5 performers for this category for current quarter, new airlines to top and bottom 5

Top 5

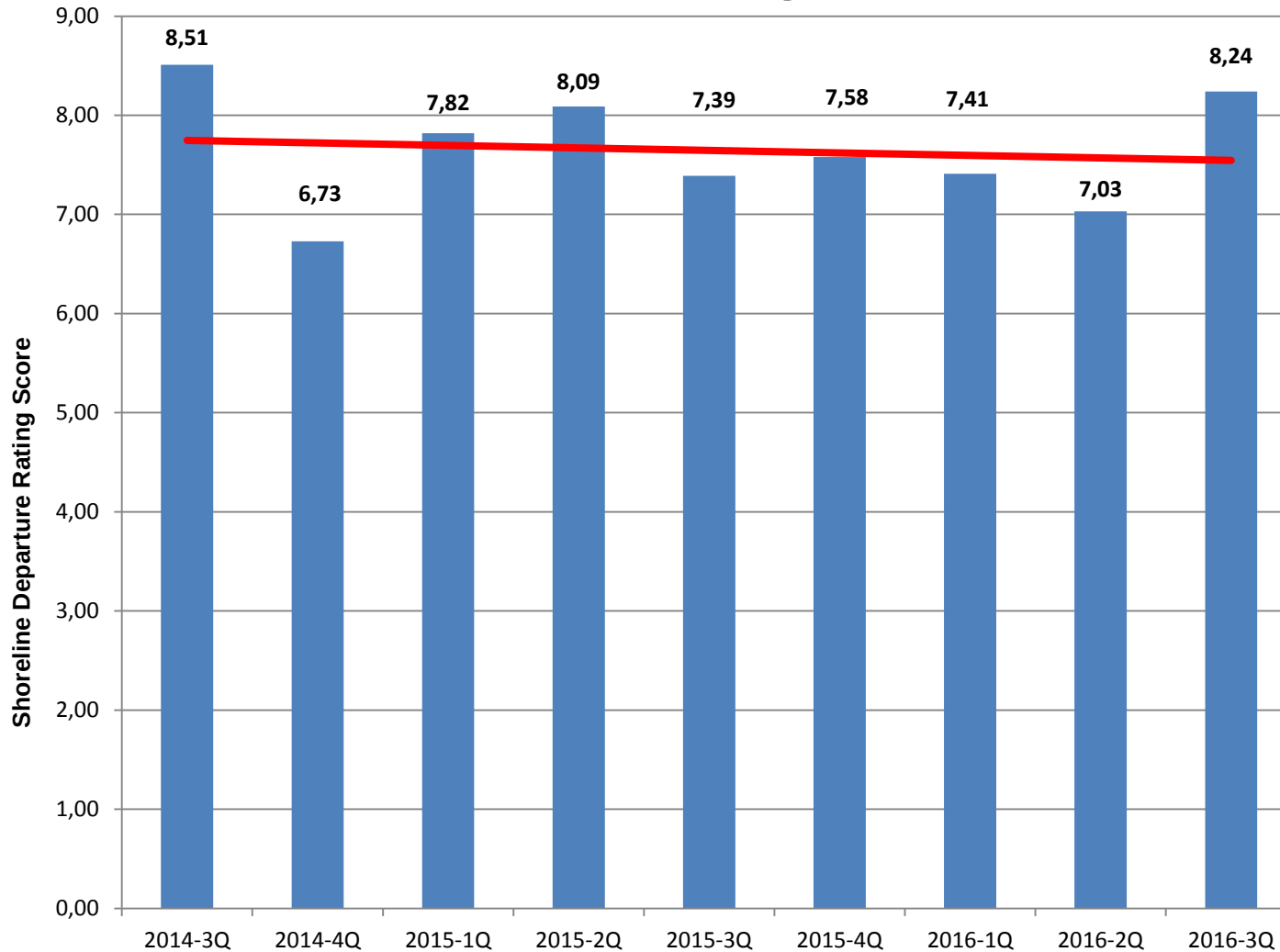


⋮

Bottom 5



Shoreline Departure Rating Averages



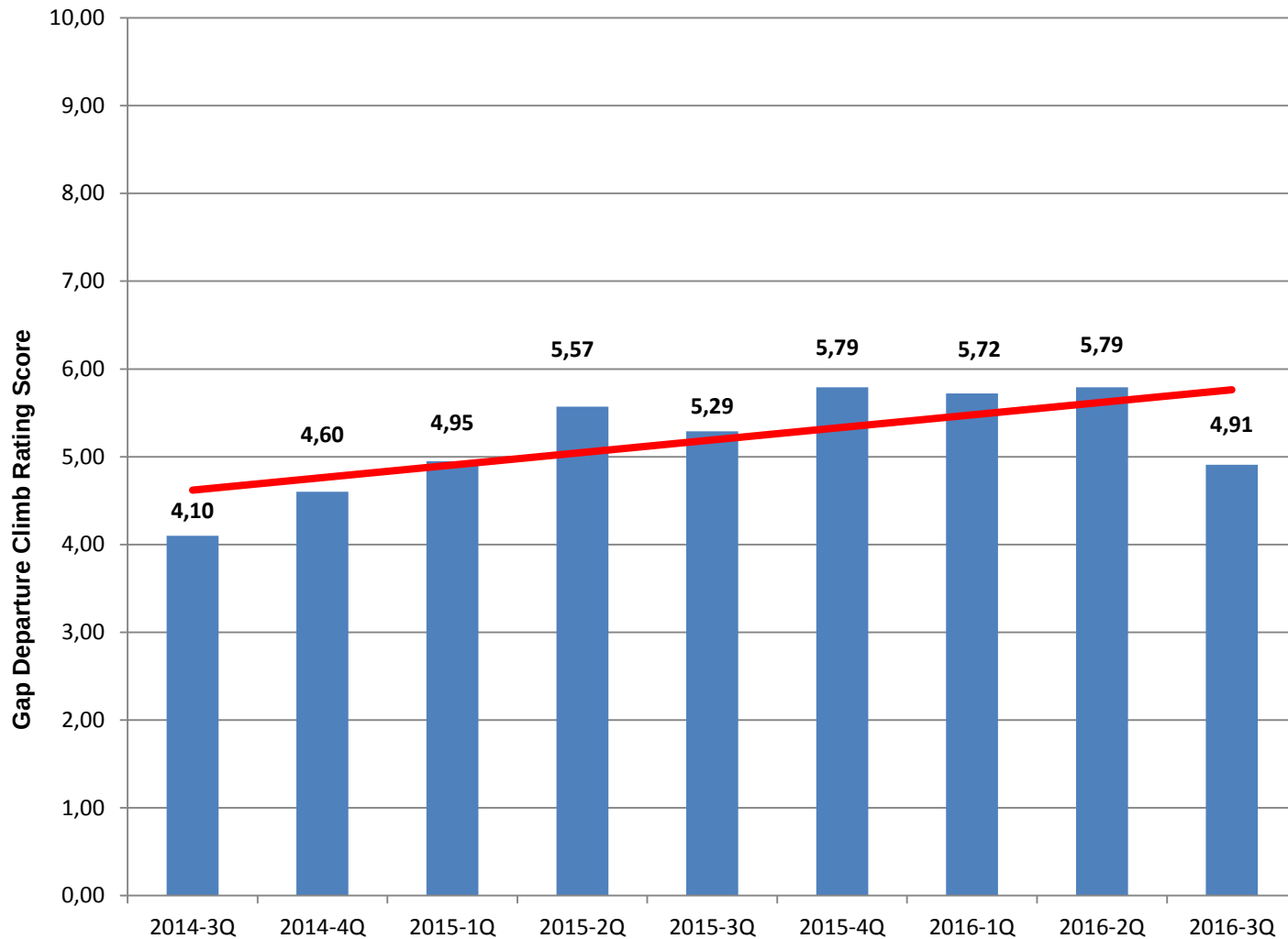
Top 5



Bottom 5



Gap Departure Climb Rating Averages



Year & Quarter

— Average of Quarterly Averages, Airline Rankings are for top 5 and bottom 5 performers for this category for current quarter, new airlines to top and bottom 5

Top 5



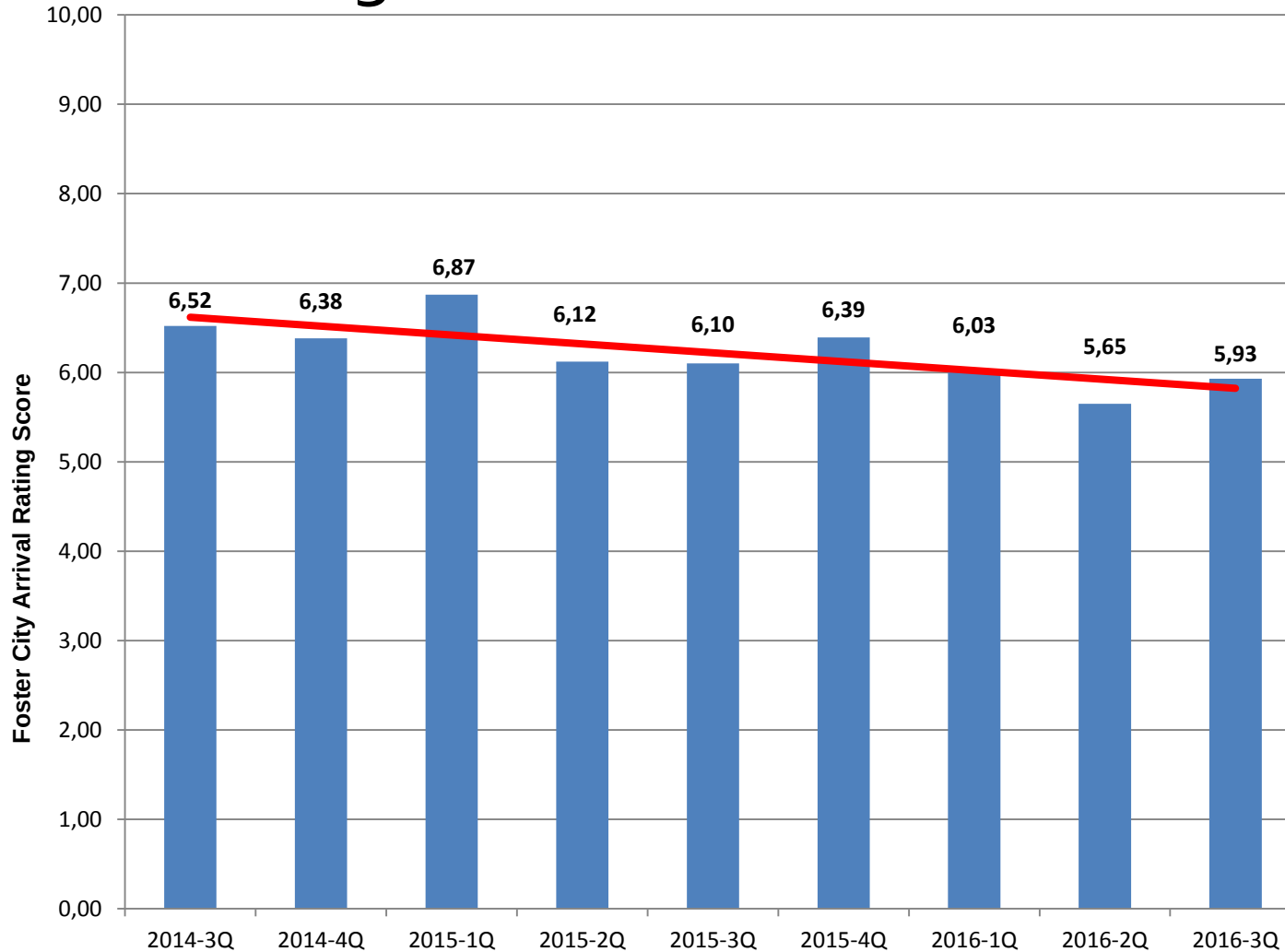
ASIANA AIRLINES



Bottom 5



Foster City Arrival Rating Averages



Year & Quarter

— Average of Quarterly Averages, Airline Rankings are for top 5 and bottom 5 performers for this category for current quarter, new airlines to top and bottom 5

Top 5



Bottom 5

