

# **Why does Congonhas Airport still need a noise monitoring system ?**

## **The background noise issue.**

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# Congonhas Airport–São Paulo City

- Still is an important domestic hub in Brazil
- Closed 7 hours daily since 1995, for environmental reasons (23:00h – 05:59h)
- Hourly capacity and range limited since 2007, for safety reasons
- Hardly contested by airliners and passengers
- Interestingly, records up little complaint about noise.



# Methods – Noise sampling

- Range of study – 62 DNL
- 23 pre-selected sites; 15 evaluated
- One week samplings, without interruption
- Mobile and unattended equipment



# Methods – Noise data analysis

- Event isolation using data acquired during Sunday mornings (lower background noise)
- Background noise calculated by conversions to SEL ( $LEq \times \text{time}$ )
- Diagnostic based on differences between total and background noise

*ABNT/NBR 13368 - Aircraft noise – Monitoring  
Verification of sound impact existence for aircraft noise  
(Author's translation from Portuguese)*

**Sound Impact**

**(Ambient Noise) – (Background Noise)  
( $LEq$  nominal difference)**

Despicable  
Significant

Lower Than 3 dB(A)  
Higher Than 3 dB(A)



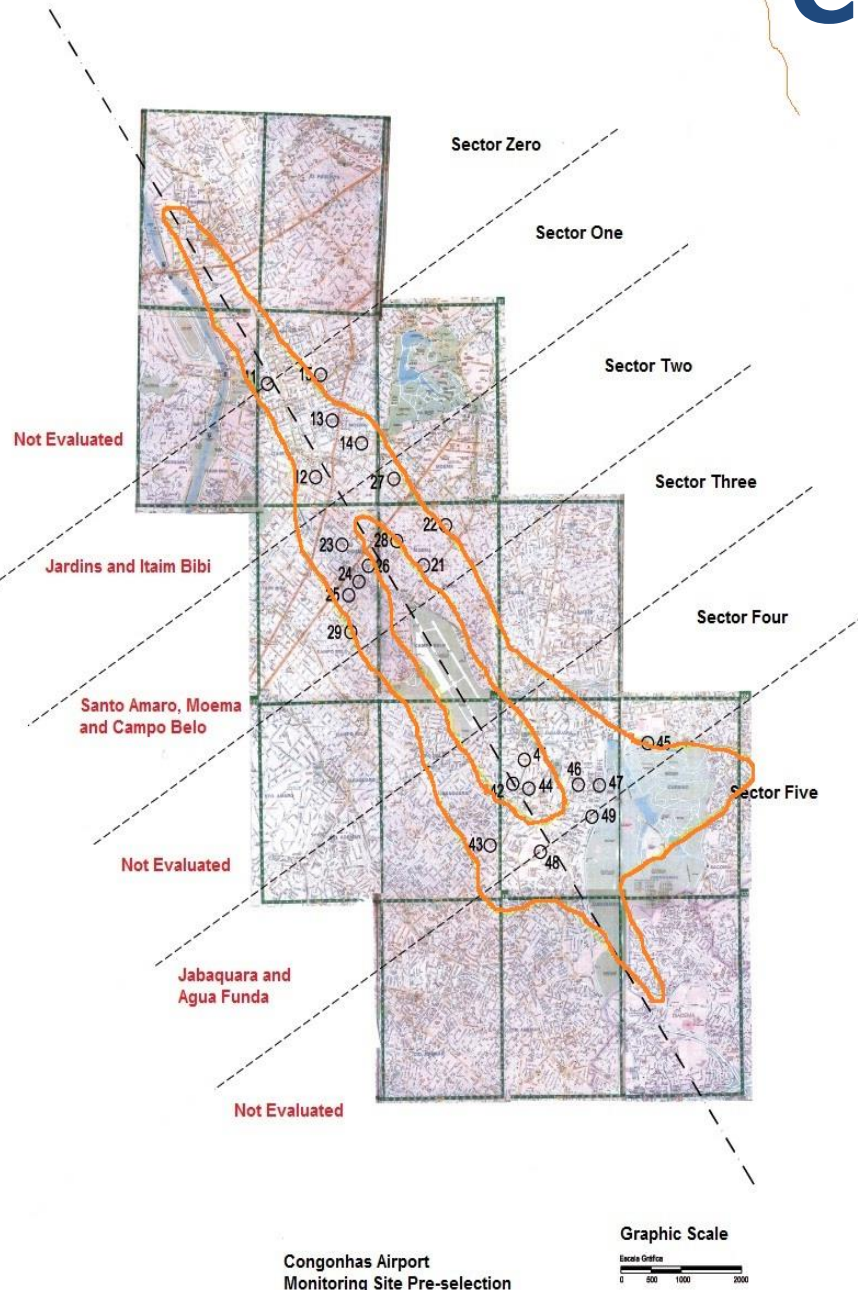
# Congonhas Airport São Paulo City

62 and 72 DNL contours  
(orange)

23 pre-selected monitoring  
sites (black)

Neighborhoods covered by  
sectors (red)

Distance between sector  
markers: one runway (2000  
meters)



578 operation daily, 12% of  
night operations and 33% of  
inverted “head”.

# Noise monitoring–Summary of results

- Only 4 of 15 sites presented a clear influence of airport operation on noise annoyance.
- Remaining 9 sites presented background noise levels above national regulation limits, out of airport closing time.
- Secondary roads with heavy traffic, as an alternative to congested major corridors
- Large increase in the use of motorcycles as a replacement for public transportation

# Motorcycles

## São Paulo Metropolitan Region

	Vehicles Licensed		Annual nominal growing	
Year	Cars+Light Utilities	Motorcycles	Cars+Light. Utilities.	Motorcycles
2001	4929116	400432	-----	-----
2002	5173798	455855	244682	55423
2003	5382866	516284	209068	60429
2004	5601665	577672	218799	61388
2005	5853966	582641	252301	4969
2006	6171192	784012	317226	201371
2007	6570932	939100	399740	155088
2008	7022643	1110104	451711	171004
2009	7464500	1214521	441857	104417
2010	7881929	1330459	417429	115938
2011	8292812	1444624	410883	114165
2012	8675738	1526579	382926	81955

Category	Description		Noise Level (dB(A))		
			Otto Cycle	Diesel Cycle	
				Direct Injection	Indirect Injection
A	Passenger vehicle until 9 seats		74	75	74
Motorcycle	Until 80 cubic centimeters	-x-x-x-	75	-x-	-x-
	From 81 to 125 cubic centimeters	-x-x-x-	77	-x-	-x-
	From 126 to 175 cubic centimeters	-x-x-x-	77	-x-	-x-
	From 176 to 350 cubic centimeters	-x-x-x-	80	-x-	-x-
	Above 350 cubic centimeters	-x-x-x-	80	-x-	-x-

One sound source:  
X dB

Two sound sources:  
(X+3) dB

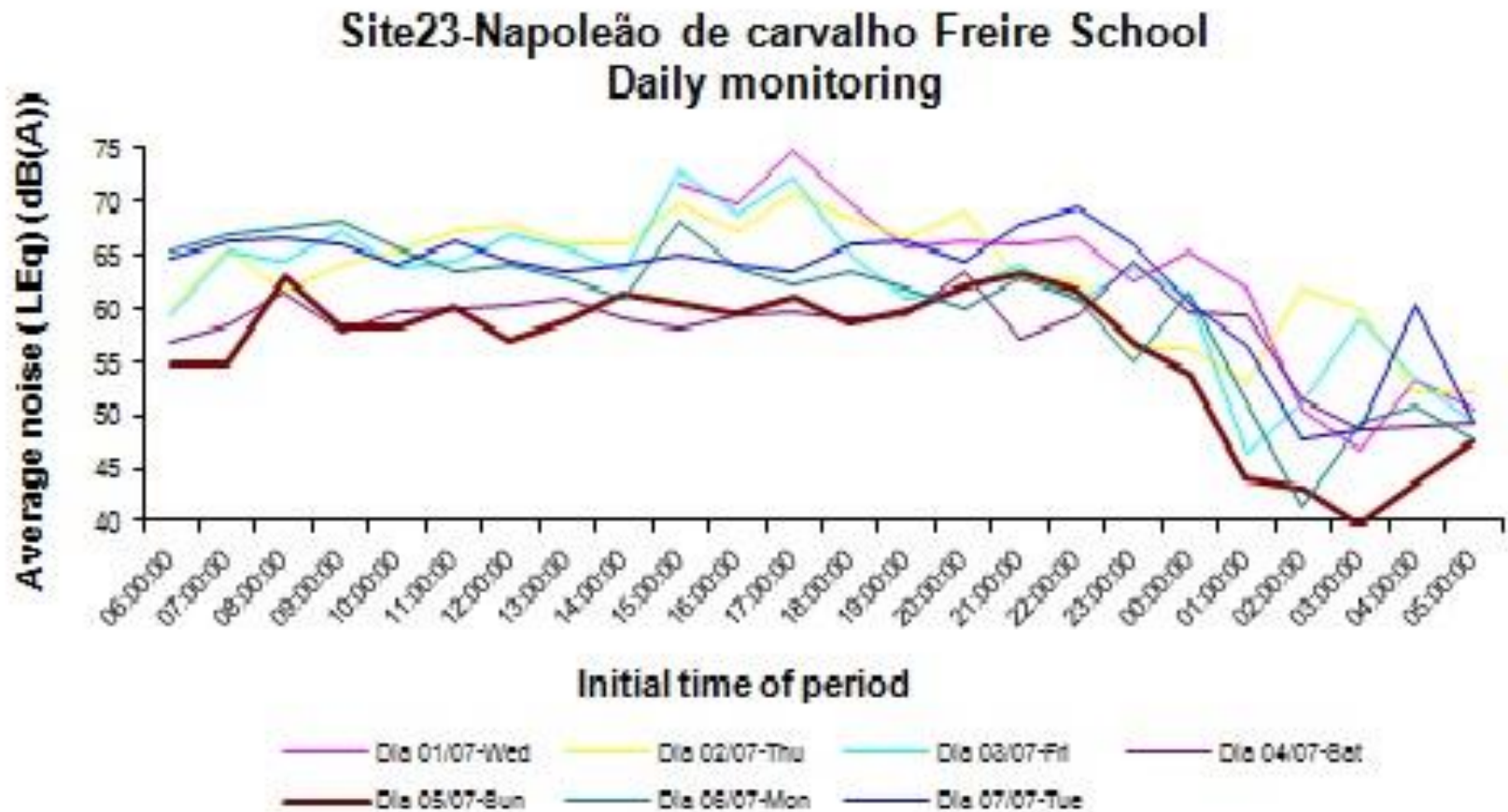
# Analysis

- Strong decrease in background noise during 21:00h – 23:00h periods
- Higher differences between total and background noise detected during 06:00h – 07:00h periods
- High background noise is often observed at times of few or none airport activity



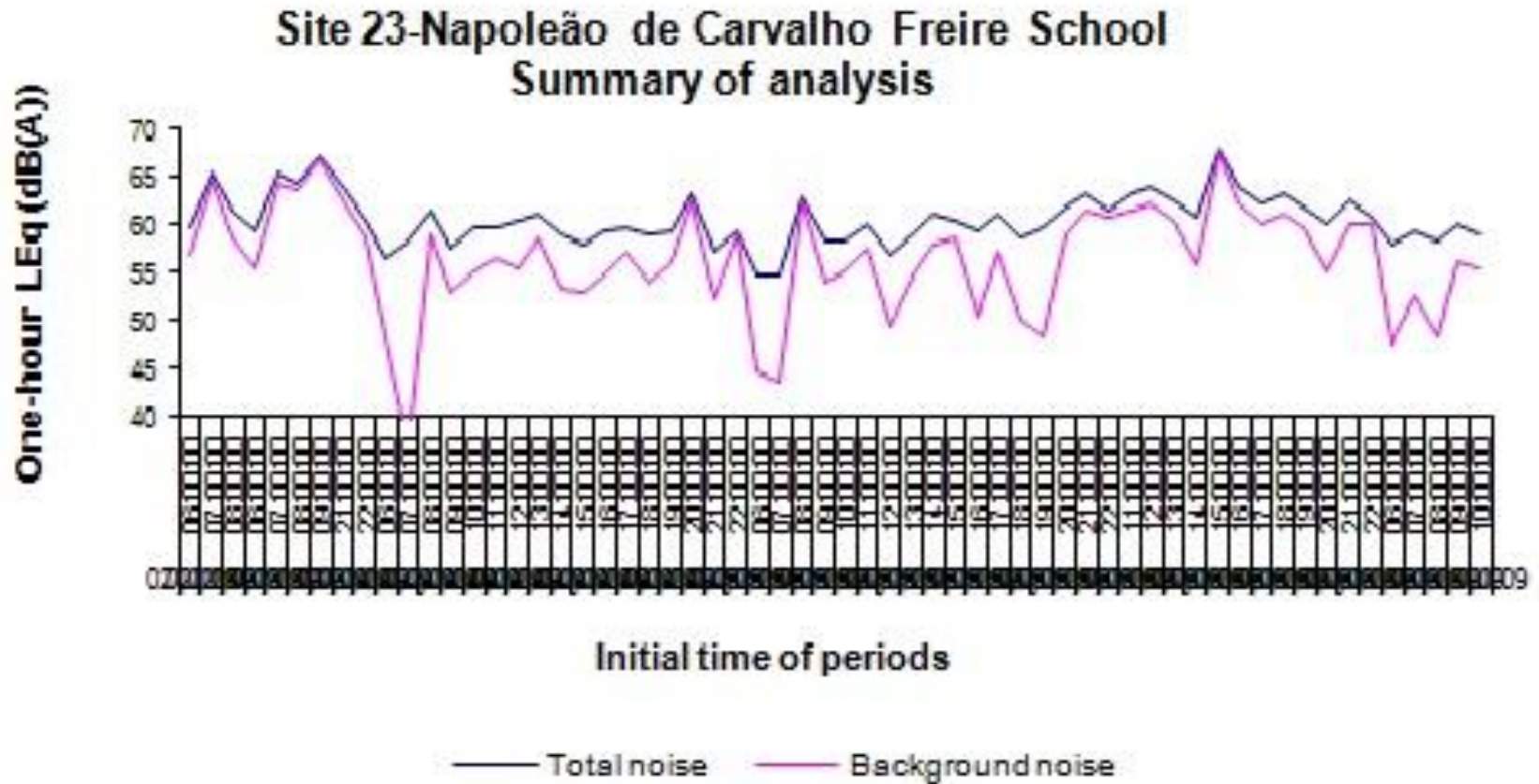
# Noise monitoring results

## Example



# Noise monitoring results

## Example



Discontinuous sampling

# Conclusions

- Background noise masks airport noise from 07:00h to 21:00h, daily, allowing even an increase of hourly capacity
- Due to range restrictions, it is possible to re-study the airport flight schedules, in attempt to reduce even more the airport noise annoyance, without reducing the daily capacity
- Monitoring data supports the major resident's claim: extend closing period, so that it starts at 22:00h

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