ITALIAN EXPERIENCES ON AIRPORT NOISE

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APAT

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1 – PREMESSA

The airport infrastractures represent one of the main noise sources, not only because of its intrinsic nature, but also as a consequence of the recent increasing traffic volumes. The Italian legislation has established to monitore the acoustic levels produced by air operations and to carry out a territorial planning, in order to agree the competing interests of the involved Municipalities and the airport developing traffic.

In 2005 the Region of Lombardia issued a Guideline for the optimisation of monitoring systems management, to unify into a single, easily readable document the whole of prescriptions provided by the many national rules and to fill in their gaps.

2 – MILAN LINATE AIRPORT

The Airport Commission has been established in 2000 and it's formed by representative of 10 Municipalities.

In 2006, by means of a specific agreement, the reference acoustic scenario has been approved, with the relative acoustic mark on the territory, and it is now under validation the decided fliyng procedure through the monitoring sysytem.

During the last years, the Commission has worked on two main problems:

- Individuation of the Municipaties enabled to participate to the Commission

- Sharing of input data (acoustic, meteo, etc.) for characterize the reference scenario

Future developments:

- Defining the airport acoustic characterization
- Verifying exceeding of the limit values
- Noise abatement and reclamation plan

3 – BERGAMO ORO AL SERIO AIRPORT

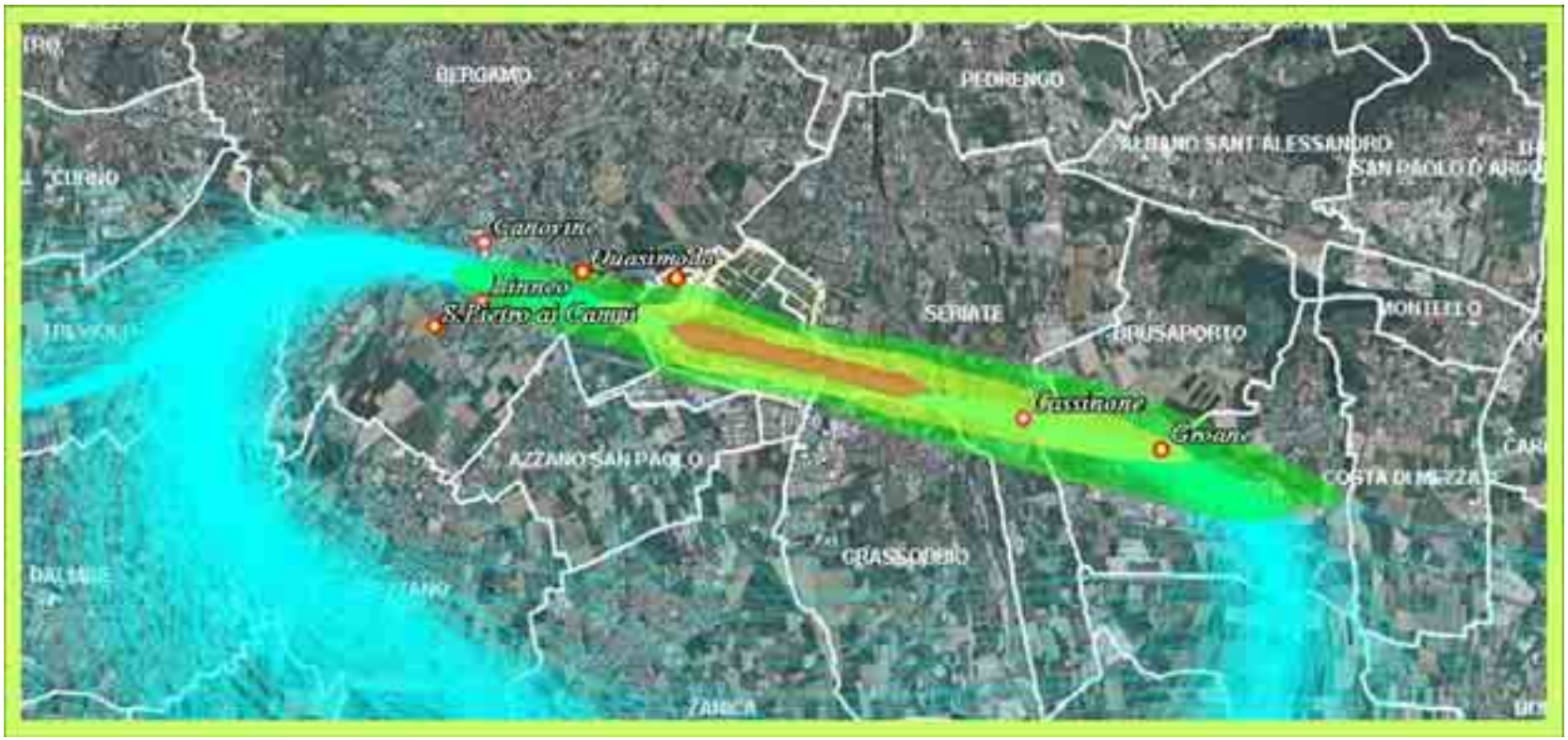
There are 7 fixed monitoring stations and there will be 8 within 2008.

According to rules indications, the monitoring stations have been installed along the takeoff and landing paths, on the areas comprised between 60 and 65 dB(A) curves.

In order to calculate the flight paths, the software tool INM (Integrated Noise Model) has been used.

On the basis of such calculations, acoustic measurements have been carried out on the chosen sites, to verify the real installing possibility.

Local problems, such as citizen committees or interests of single Municipalitiy, have been taken in account.



Bergamo airport

The monitoring station is formed by:

- a support with a microphone
- meteo probe, to measure temperature, humidity, wind direction and speed, etc.
- cabinet with a sound level meter connected to an industrial pc, to save data, which carries out a first screening, and a modem for downloading data.
- backup battery for electrical supply

industrial PC

Sound level meter

Microphone

Probe Meteo
temperature
umidity
wind speed
wind direction

Backup battery

Modem

In addition to the measurements, it is necessary to have information about the traffic. Such information is provided by:

- Database of daily flights

- Radar traces

Since these two data sets, a match can be done to obtain all the daily movements.

Finally, it is possible to correlate the results to the measured sound events in order to assign them an acoustic level.

The elaborated data are monthly published on the airport web site.

4 – NEAPLES CAPODICHINO AIRPORT

The Airport Commission, established in 2000, has aleady finished its work:

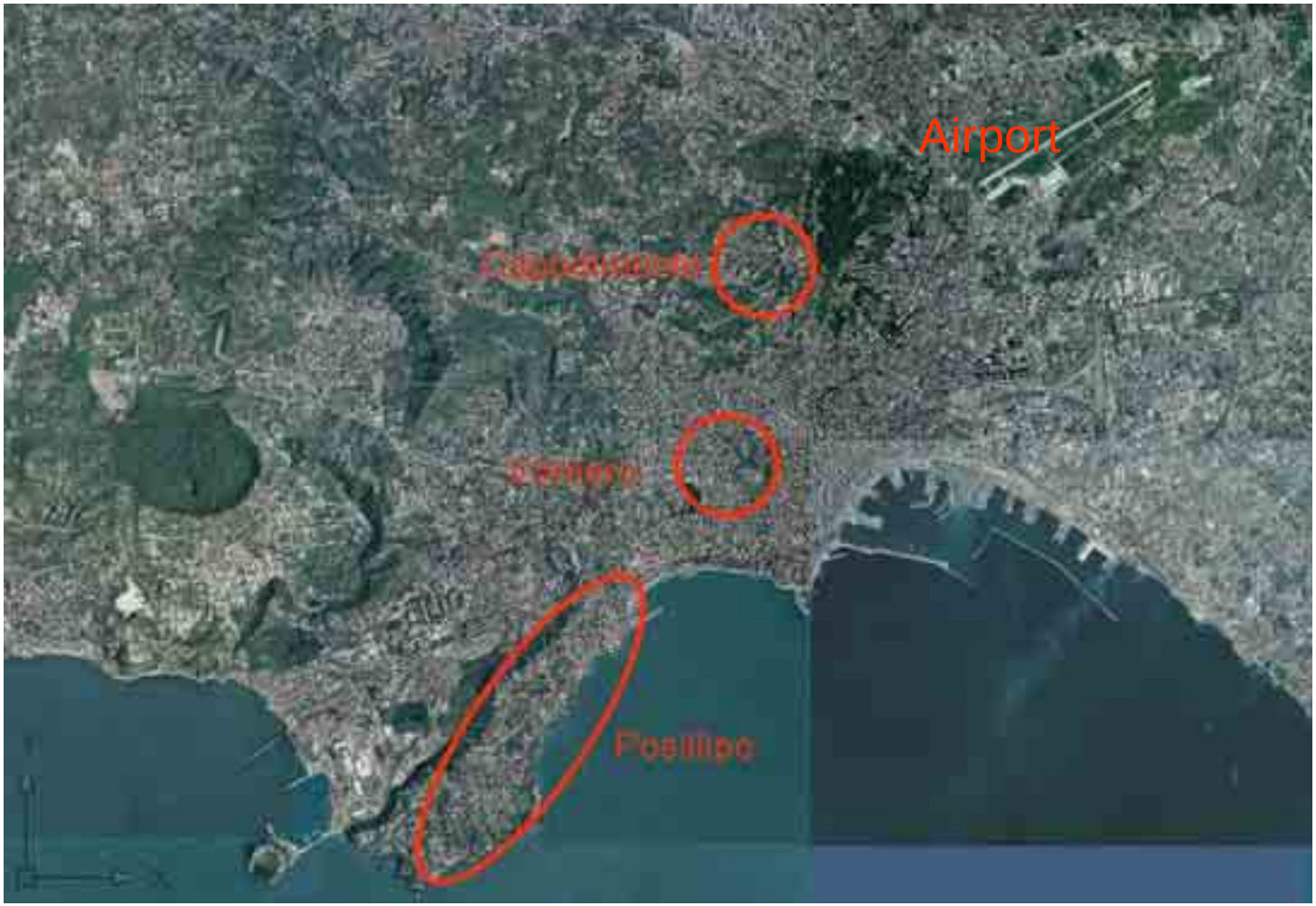
- Curves at 60, 65 and 75 dBA level approved, with periodic revision
- Noise abatement procedures approved
- Airport acoustic characterization defined
- Monitoring system installed, formed by 8 sound level meters.

The monitoring system, financed by the Ministry of the Environment, has permitted to put in activity the sanctions against those companies which do not respect the abatement noise procedures.

There are 2 involved Municipalities. Neaples is interested in three main zones:

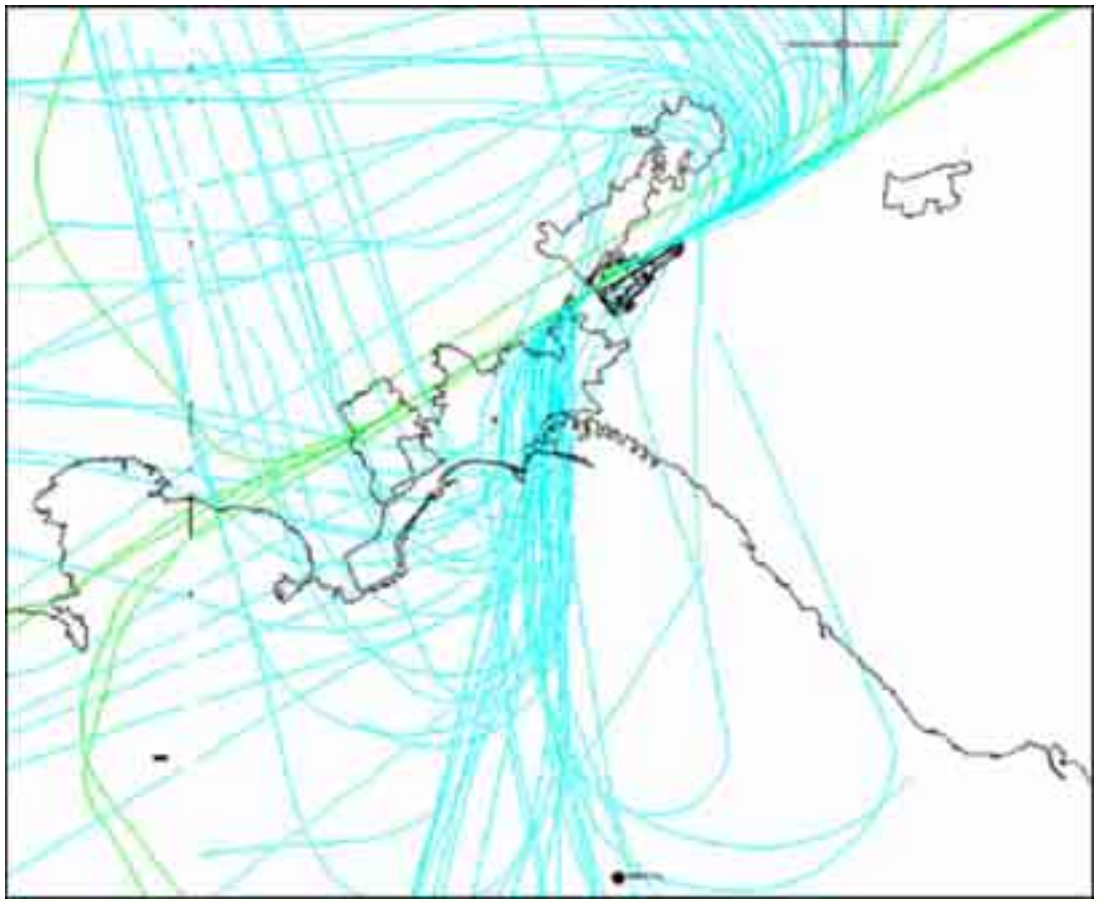
- Capodimonte
- Vomero
- Posillipo

Because of their altitude, these zones are nearest to the takeoff and landing paths.

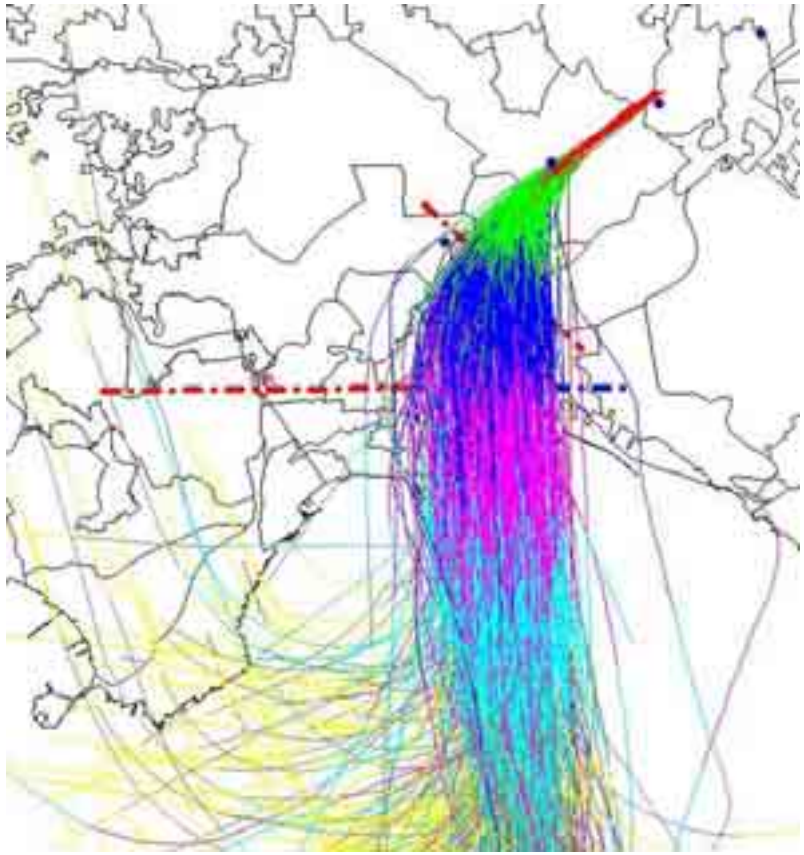


Neaples airport and interested area

In 2001 there was a single abatement noise procedure: to turn at sight toward the sea, testing the ability of the pilot and the performance of the airplane. Such procedure produced an high dispersion of routes.



By means of noise abatement procedures and sanctions, the percentage of respected procedures has grown from 26% at May 2001 up to 97% at May 2007.



The sanctions started in 2006. Their amount varies from € 250 up to € 10.000 per flight. More than 5.000 sanctions have been applied, whose 60% have been paid.

Some companies did not respect the noise abatement procedure because they didn't know.

In this case, meetings have been managed directly with the pilots, who often didn't have latest aeronautic charts.

5 – BOLOGNA G. MARCONI AIRPORT

The Airport Commission in 2002 has approved the noise abatement procedures.

There is a monitoring system, but the sanctions are not operating.

In 2004 the airport runway has been extended, with these advantages:

- Anticipation of the turn and reduction of the flights over populated zones

- Higher altitude flights

- Lower utilization of reverse

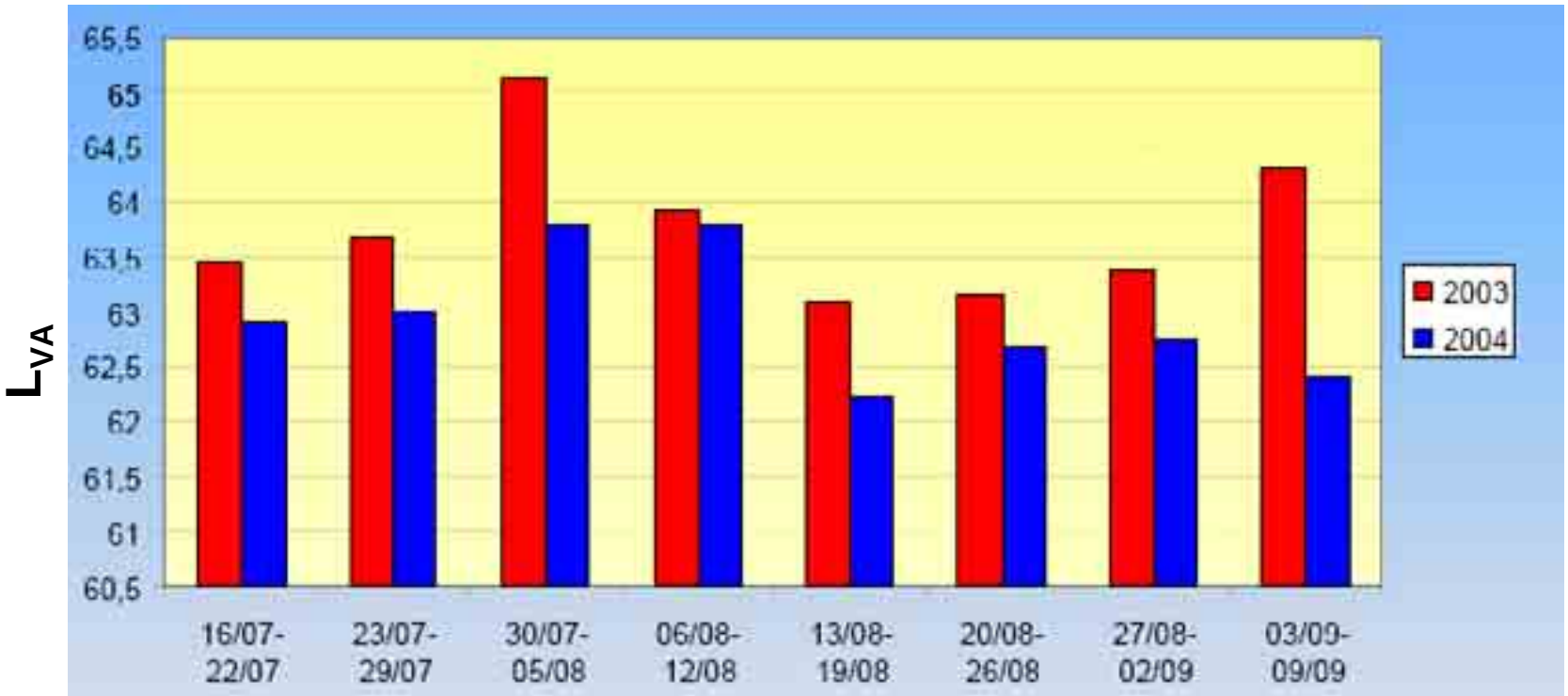
Bologna airport

Bologna airport

Compared to 2001, despite of civil flghts increased to 61,5% and commercial to 73,2%, these results have been obtained:

- Weekly medium L_{VA} reduced of 5 dB, from 68 to 63 dB(A)
- Weekly maximum L_{VA} reduced of 8 dB, from 70 to 74 dB(A)

Comparison between weekly L_{VA}: July and August 2003/2004



6 – FLORENCE A. VESPUCCI AIRPORT

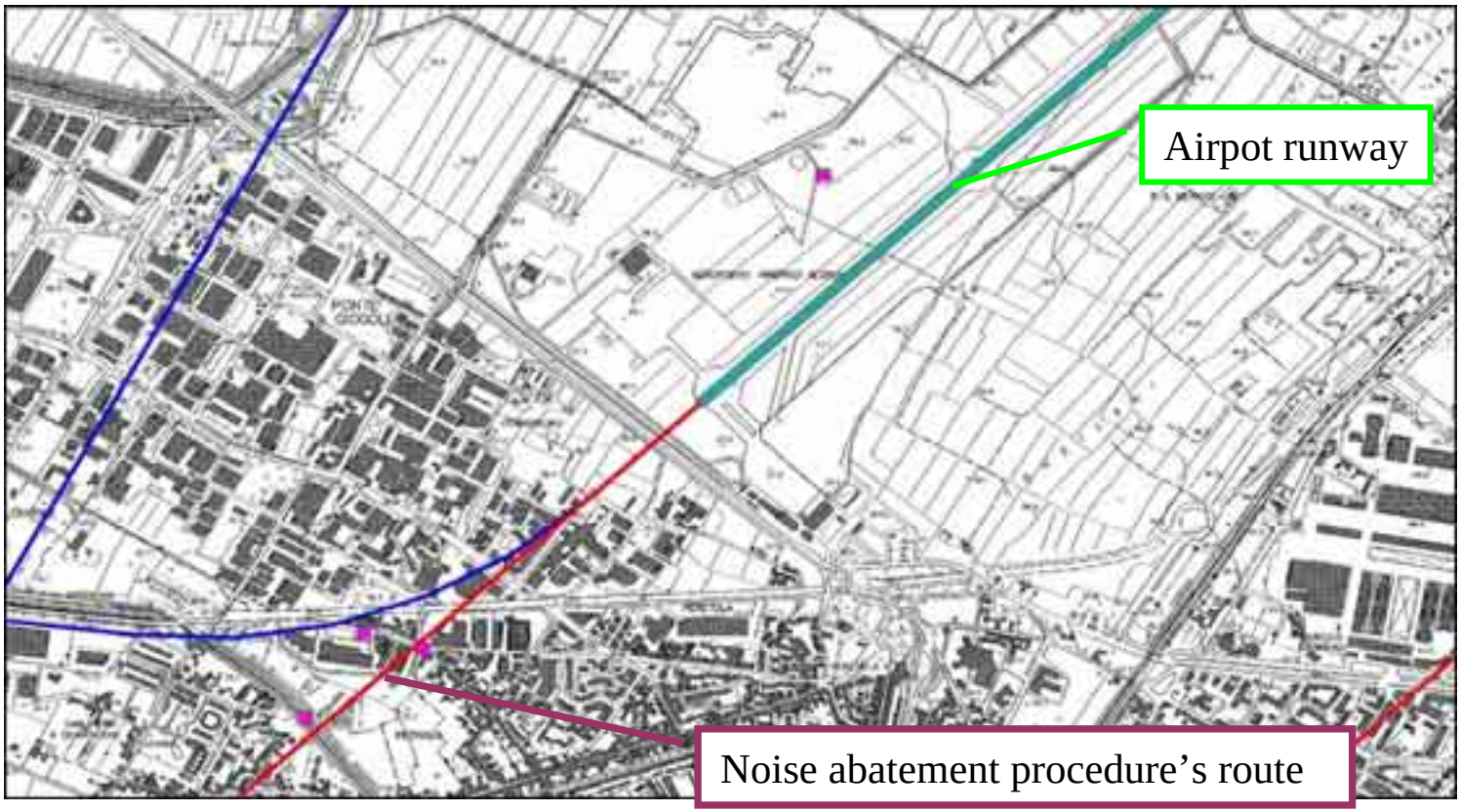
- First measurements in 1992.

- Measures of L_{va} since 2000 carried out by the Regional Agency for the Environment Protection of Tuscany (ARPAT).

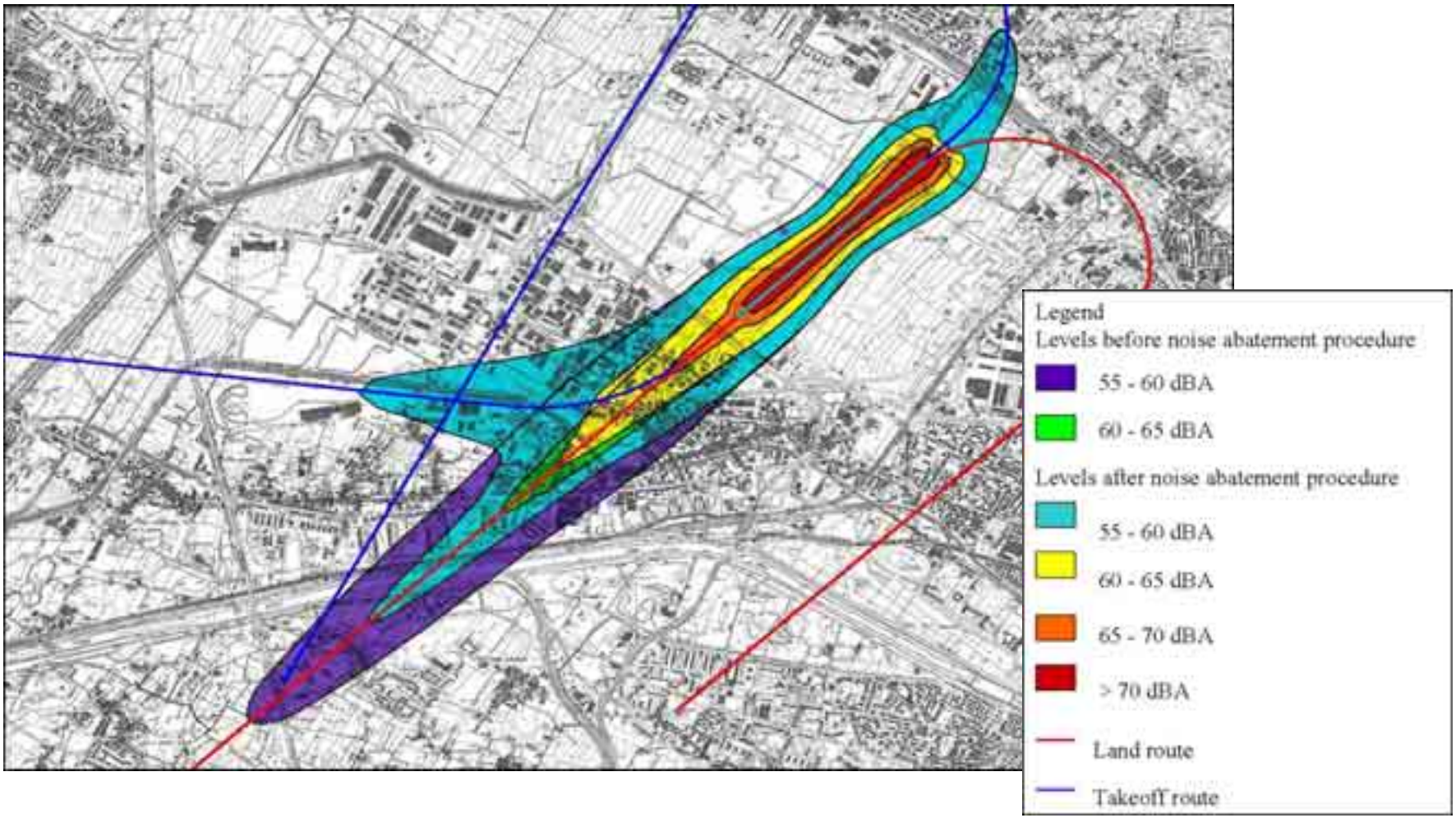
- Airport Commission established in 2000.

- Monitoring system has been realized in 2002 but it is not operative because of radar tracings lacking.

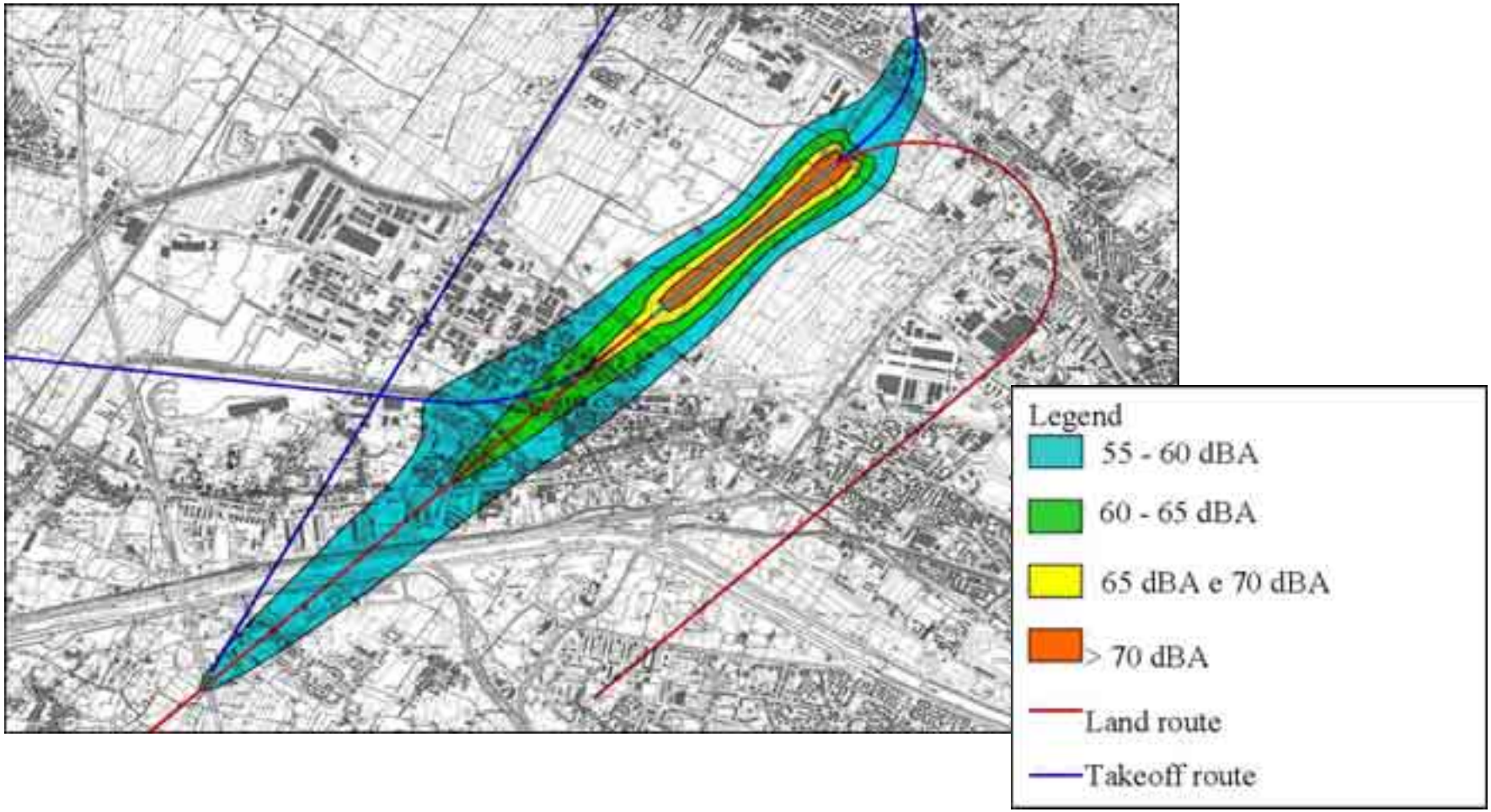
The noise abatement procedure, introduced in 2002, established a turn toward west after the takeoff.



Effects of the noise abatement procedure



Through the numeric software Integrated Noise Model, L_{va} acoustic levels have been calculated for 2002



On the basis of the results, these parameters have been evaluated:

- Occupied areas with L_{va} acoustic levels higher than 55 dB(A)
- Exposed population

The full application of the noise abatement procedures is able to reduce the amount of exposed poulation.

Restriced zones	Occupied area (km^2)		Exposed population	
	Before	After	Before	After
55 dB(A) < Lva < 60 dB(A)	2.71	2.33	4334	3261
60 dB(A) < Lva < 65 dB(A)	0.82	0.72	1001	330
65 dB(A) < Lva < 70 dB(A)	0.49	0.49	0	0