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The relation between NA60 and community complaints during the introduction of the fifth runway at Amsterdam Airport Schiphol

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Abstract

Some major changes have recently taken place at Schiphol Airport, relating to the introduction of the new fifth runway on the 20th of February 2003. Since the new runway has been taken into operation the number of complaints from the surrounding community has increased dramatically. As standard methodologies do not predict this effect very well, this research is a first step in trying to predict nuisance around the airport and describes the noise metric NA60¹ for Amsterdam Airport Schiphol. This noise metric correlates better to the registered complaints from the surrounding of Schiphol than the standard noise metrics L_{den} and L_{night} . This supports the hypothesis that complaints are related to maximum aircraft noise levels and to the frequency of aircraft passing.

Although registered complaints could give a global impression about some aspects of annoyance, the authors are aware of the fact that they are an inadequate indicator of the full extent of noise effects (for example sleeping or communication disorders, high blood pressure levels etc) on a population. The complaints are however a suitable and easy performance indicator for the noise nuisance around Amsterdam Airport Schiphol. There are multiple reasons to complain for instance noise nuisance, smell or horizon pollution. This research assumes that all complaints arise from noise nuisance.

The paper presents the calculated NA60 contours and the complaints in the vicinity of Amsterdam Airport Schiphol. The results from a first analysis are promising due to the fact that a relation is found between the NA60 noise metric and the complaints from Castricum.

¹ Number of flights above the 60 dB(A) per time-period (NA = number above)



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1 Introduction

Schiphol, the world's 9th largest airport, is a major driver of the Dutch economy, generating direct employment for over 55,000 people. Some major changes have recently taken place at Schiphol Airport, relating to the introduction of the new fifth runway. The fifth runway, called the 'Polderbaan', is essential for Schiphol's position as a European hub and allows the airport to accommodate the foreseen traffic growth within the environmental restrictions as stated in the new Aviation Act.

On February 20th 2003, the new runway became operational for night flights only; June 2003 was the last month in which the original 4-runway configuration was used. The new runway became gradually operational from July 1st onwards and per November 1st all 5-runways were fully operational. The fifth runway, although situated in a dense populated environment, was supposed to have a major environmental benefit, shifting air traffic from densely populated areas around Schiphol; i.e. the city of Amsterdam, to less densely populated areas.

Since the new runway has been taken into operation, the number of complaints from the surrounding community has increased dramatically. Especially in the area situated north of Schiphol the increase in complaints was significant. This paper is a first step to presenting the nuisance experienced around the airport in relationship to the new metric NA60; the number of noise events above 60 dB(A). An advantage of this NA60 is that it can be well explained to the public, contrary to other noise descriptors like L_{den} and L_{night} . For this reason it is expected that the NAx metric suits the Schiphol situation very well, reflecting the experienced public's annoyance much better than the traditional noise load descriptors would do.

A study by INTOMART about the experienced nuisance from aircraft flying to and from Schiphol Airport revealed that a large portion of the residents around the airport would prefer more information about traffic in the surrounding of Schiphol [1]. A large number of people would like to have more information about actual runway and route usage.

2 NA60

The introduction of the new fifth runway at Schiphol Airport seems to have increased the number of complaints from the surrounding community. Particularly in the northern region complaints are significant. A possible reason might be that the people in this region are not (yet) used to aircraft noise. For this region in particular the NA60 metric may provide a



comprehensive set of information. Therefore we performed calculations specific for this region with the NA60 noise metric.

At Sydney airport the NA70 metric, together with other presentation formats such as respite hour charts, provides a comprehensive set of information [2].

The NA60 values used in this paper are derived from noise calculations. Three months were selected that each mark a significant change in runway configuration, each leading to a specific traffic distribution around Schiphol. The first time-frame, June 2003, was the last month in which the original 4-runway configuration was used. In July 2003, the new runway was gradually taken into operation leading to a fully operational 5-runway configuration in November 2003.

The NA60 values, or the number above 60 dB(A), are extracted from grid calculations for the northern region of Schiphol Airport. The calculations only use the flights, which flew in the period between 07:00- 23:00 hr LT, this matches the period in which the day-complaints were registered. The NA60 contours and complaints are presented in Figures 1, 2 and 3.

3 Complaints around Schiphol

The Complaints and Information Bureau of the Regional Consultation Committee Airport Schiphol (CROS; Commissie Regionaal Overleg luchthaven Schiphol) registers all incoming aircraft noise complaints around Schiphol [3]. The registration of complaints is potentially suitable for monitoring purposes.

The number of complaints during the day are also shown in Figures 1, 2 and 3. For June 2003, which was the last month in which the original 4-runway configuration was used, the complaints are more or less equally distributed. Although complaints from arrivals are already relatively high in the northern region. In July 2003 the new runway became gradually operational. This is reflected by an increase in complaints in the northern region, merely caused by arrivals on the new runway. During this month complaints from the Amsterdam region from particularly aircraft departures decreased. In November 2003, when the 5-runway configuration was fully operational, the number of complaints caused by approaching aircraft in the northern region is again significant.



4 Discussion and Conclusions

The figures 1,2 and 3 show a better coverage of the NA60 contours with the registered complaints than the NA70 noise metric [4]. This yields the opportunity to find a possible relation between the NA60 and complaints (see table 1).

Table 1: Amount of complaints and NA60 values in Castricum for June, July and November.

	<i>Amount of Complaints</i>	<i>NA60 value</i>	<i>Increase in Complaints</i>	<i>Increase in NA60</i>
June	1871	335	-	-
July	3495	661	1.9	2.0
November	7302	1170	3.9	3.5

The results from a first analysis (in table 1) are promising due to the fact that a relation is found between the NA60 noise metric and the complaints from Castricum. The increase in complaints is almost linear with the increase in NA60 values. This suggests that a passing aircraft with a noise level equal or higher than 60 dB(A) generates on average six complaints.

This will be verified in detail in future research.

References

- [1] Perception research Schiphol- 1-measurement December 2003, Intomart GfK, RvdD/11.250, April 2004
- [2] Sydney airport masterplan: procedures for reporting predicted noise impacts, March 2003, Report 02273-1
- [3] <http://www.crosinfo.nl/>
- [4] NLR-TP-2004-300, The relation between NA70 and community complaints during the introduction of the fifth runway at Amsterdam Airport Schiphol, Balke et al., 2004

Figures

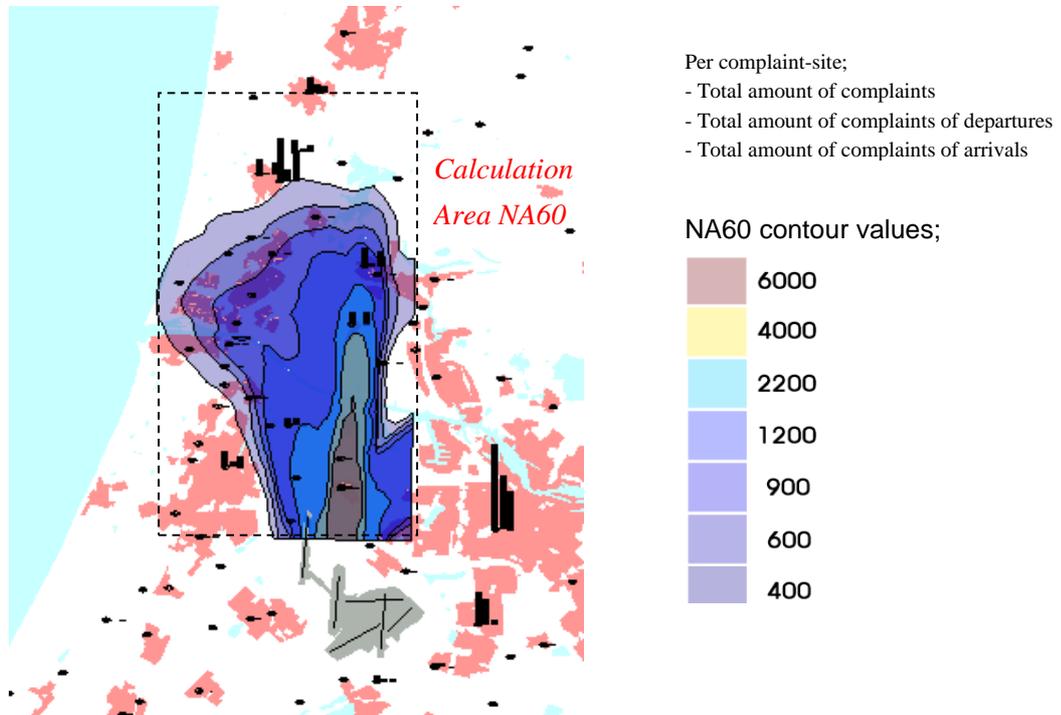


Figure 1: June 2003, NA60 contours and complaints in period 07:00- 23:00 LT

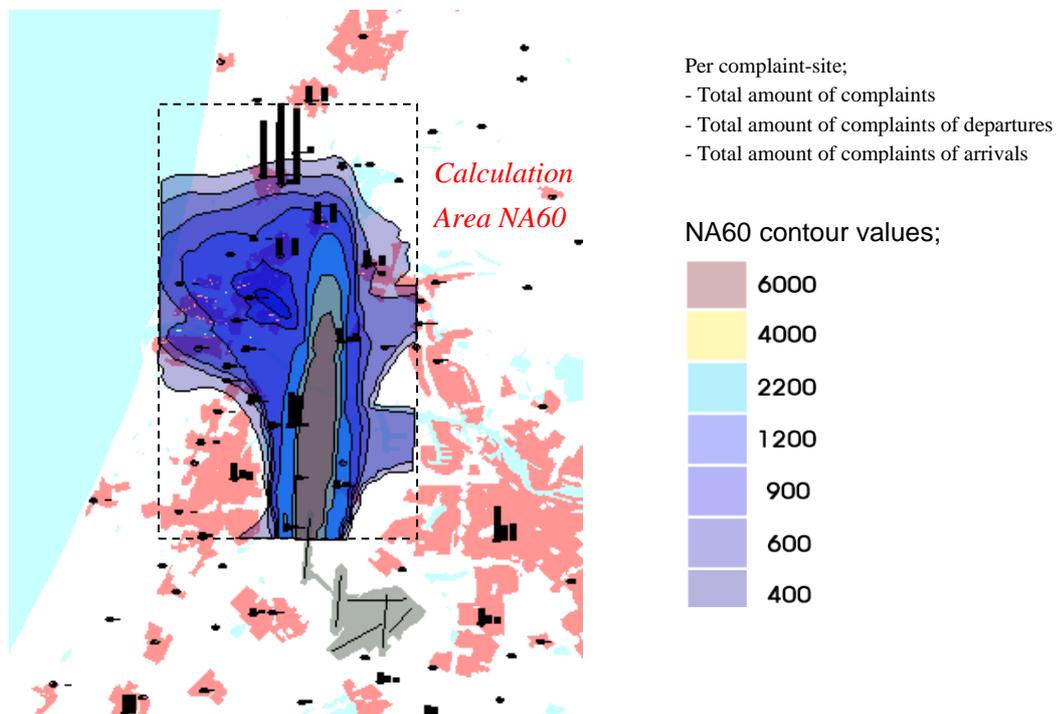


Figure 2: July 2003, NA60 contours and complaints in period 07:00- 23:00 LT

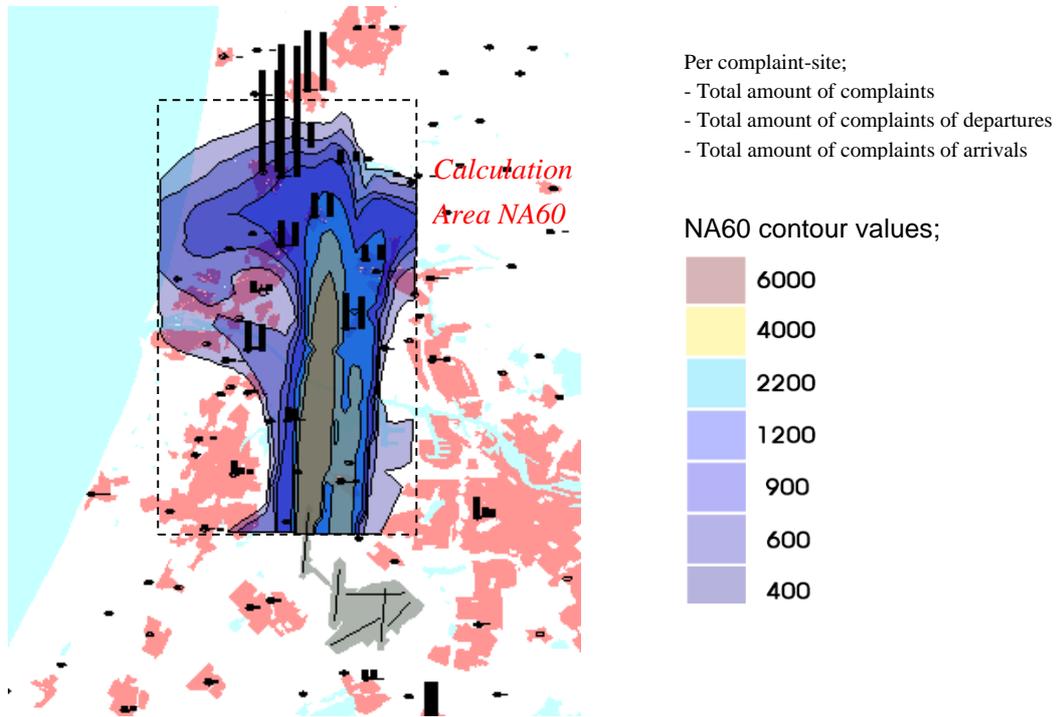


Figure 3: November 2003, NA60 contours and complaints in period 07:00- 23:00 LT