

# **ANNOYANCE REDUCTION DUE TO THE HELI-SCHEDULER AT AUGSBURG REGIONAL AIRPORT**

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## **ABSTRACT**

The Heli-Scheduler is a web-based slot system, which co-ordinates helicopter flights and limits them to 7:00 p.m. The following study investigated potential benefits concerning annoyance reduction.

Although the existence of the Heli-Scheduler was unknown to the majority of the residents, it was very successful in the closest areas heavily affected by helicopter noise. Before re-organisation of helicopter flights, these residents rated their annoyance 3.7 on a 5point scale (quite annoyed), afterwards 2.6 (medium annoyed).

The Heli-Scheduler could be an effective way, also for other airports with helicopter noise, to relieve residents living closely to the helicopter operation areas.

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## **INTRODUCTION**

Augsburg-Muehlhausen is a regional airport with 47.000 movements in the six busiest months of the year 1999. Moreover, helicopters and sporting planes play an important role since several flying schools and aeroclubs have their home bases in Augsburg. The airport plans an extension, which keeps the total number of movements constant but reduces small propeller aircraft and increases ICAO 16 propeller air planes by 42 % and jets by 580 % in the year 2010 (Probst, 2000).

In the view of the residents, they have been kept in suspense with respect to the growth of traffic in Augsburg. They feel insufficiently informed by the airport management. Additionally, a few tragic incidents in the region like the crash of a godesy aircraft into a field and of an ice lump into a roof have lead to fear, anger, and other negative emotions. The mistrust towards the airport and the aviation authorities is great.

The Bavarian local government heard the concerned citizens whose noise exposure forecast for 2010 reached 55 dB(A) daytime Leq or more. Although only the closest living area west of the airport runs the risk of being exposed to definitely health threatening average levels of 65 dB(A), the airport management committed to reduce the helicopter noise prevalent mainly in the South by introducing a Heli-Scheduler.

## THE HELI-SCHEDULER

In order to effectively reduce evening noise produced by helicopters and thereby relieve residents living closely to the helicopter training area, Augsburg Airport developed an internet-based slot system called the Heli-Scheduler. Its purpose is to co-ordinate helicopter flights and to limit them to 7 p.m. during the months of April to September and to 30 minutes after sunset during the remaining months of the year. Moreover, only one helicopter at a time is allowed in the air. Before the Heli-Scheduler came into effect on October 15<sup>th</sup> 2001, helicopter flights took place until 10 p.m. and there was often more than one helicopter in the air.

The Augsburg Heli-Scheduler is only accessible for authorised members. Once subscribed by filling in a matriculation screen, pilots may log into the system by using their screen name and password. For the reservation of slots, a special screen with a booking plan has been developed. It shows all days of the month with take-off times (only one take-off per hour). Already reserved slots are marked in black, the non-reserved ones in grey. After choosing a desired free slot, subscribed members can make reservations on the following screen. Moreover, other screens related to the Heli-Scheduler containing more information about other users, time-zones of the months, reservations, and cancellations can be seen.

It was expected that the Heli-Scheduler would significantly reduce annoyance but only in the South, where the helicopter pad and training area is located. In order to test this hypothesis, telephone interviews were carried out before (pre-interviews) and after (post-interviews) installation of the Heli-Scheduler. Moreover, data gathered by a noise telephone (Maziul & Vogt, this conference) could be used for the evaluation of the Heli-Scheduler.

## METHOD

Four investigation areas were selected according to the four cardinal points. They are referred to in this paper as East, North, South, and West. A University letter announcing a noise study and inviting the residents to participate was sent to 539 people. The residents were able to choose the dates and times when they wished to be called for an interview. An enclosed free return envelope enabled one person from each household to volunteer for the study. However, the return rate was below five percent and therefore also non-responders were contacted by telephone. Age, sex, profession, and investigation area were obtained as case characteristics. All interviews consisted of standardised noise scales as well as open questions, which were categorised post-hoc. The results reported in this paper concern the knowledge of the residents about the re-organisation of helicopter flights, whether they had noticed any changes in helicopter operations, satisfaction with the airport management and annoyance before and after installation of the Heli-Scheduler. All ratings were made according to the 5-point category scales of Rohrmann (1978). The annoyance categories were for example not at all (1), a little (2), medium (3), quite (4), and highly (5) annoyed. Finally, the residents were asked about further desires in terms of changes in helicopter operations and if these changes could influence their attitude towards the airport. Table 1 gives an overview of the interview.

Table 1: Structure of the pre- and post-interview for the study.

Introduction	Background of the study, informed consent, declaration of data protection
Case characteristics	Sex, age, investigation area, profession
Concern (current situation)	Most intruding noise events (ranking), reasons for interference, loudness of aircraft noise in general (five point rating scale according to Rohrmann, 1978), annoyance of aircraft noise in general (five point Rohrmann rating scale), duration of residence (years), flat/house hired or owned, anxiety of flat/house depreciation (five point Rohrmann scale), private and business use of Augsburg, Munich, or other airports (frequency per year), belief that noise is health threatening (five point Rohrmann scale), satisfaction with health status (five point Rohrmann scale), sensitivity to noise (five point Rohrmann scale), annoyance of aircraft noise in general (seven point rating scale according to VDI 3883)
Heading for good neighbourhood (desired situation)	Description of the relationship residents-airport, leitemotion, ranking of people having financial benefits through the airport, vision of good neighbourhood, what could the airport do to reach and sustain good neighbourhood, what could the residents do, probability of improvement by scientific mediators (five point Rohrmann scale), probability of using the NoiseCall (five point Rohrmann scale), positive influence of annoyance abatement procedures like NoiseCall on attitude towards airport (five point Rohrmann scale), conditions for coming round to a sustainable extension of the airport, participation in further studies
Additional items in the post-interview	Knowledge about the limitation of helicopter flights, to what extent was this noticeable (five point Rohrmann scale), why/why not was the Heli-Scheduler effective, further desires with respect to helicopter operations, probability of thereby achieved good neighbourhood (five point Rohrmann scale)

The noise telephone (Maziul & Vogt, this conference) was operated from 1<sup>st</sup> of September to 31<sup>st</sup> of October 2001 (end of summer flight plan) and 25<sup>th</sup> of February (begin of summer flight plan) to 19<sup>th</sup> of April 2002. Residents were invited to phone any time (24 hours a day) during this period. In a half-structured interview, the complaint was recorded, annoyance and proposals for potential counter-measures were obtained. With respect to the Heli-Scheduler, which was installed on October 15<sup>th</sup> 2001, the caller was asked whether he knew about this measure and – after October 15<sup>th</sup> – whether a change in helicopter noise was noticeable. The second wave of telephone interviews was started November 1<sup>st</sup> 2001 with the aim to reach half of the pre-interviewed. Only in a few cases, a subject was unavailable or unwilling to participate a second time and another person of the same household was asked. Table 2 summarises the design of the study and the respective number of interviews.

Table 2: Design, time table, and number of interviews in the study.

Stage of study:	Pre-Interviews	Interventions		Post-Interviews
		Telephone	Scheduler	
Begin:	1 <sup>st</sup> June; 1 <sup>st</sup> November	1 <sup>st</sup> September; 25 <sup>th</sup> February	15 <sup>th</sup> October	1 <sup>st</sup> November
Number of interviews:	183	63	--	79
End:	31 <sup>st</sup> August 31 <sup>st</sup> January	31 <sup>st</sup> October; 19 <sup>th</sup> April	--	ongoing

## RESULTS

Although 82% of the interviewed residents did not know about the installation of the Heli-Scheduler, it had significant benefits, especially in the most affected living areas close to the helicopter operation area (main effect time  $F_{2,53}=4.304$ ;  $p=0.046$  in a within-subjects analysis of variances with the group factor area). In the South, average annoyance due to helicopter noise could be reduced from 3.7 (quite annoyed) to 2.6 (little to medium annoyed;  $p=0.010$ ). Also in the North the mean response to helicopters decreased (from 3.2 to 2.1;  $p=0.009$ ). In the East, annoyance was varying between 2 and 3 (little and medium annoyed) and did not change significantly after installation of the Heli-Scheduler (Figure 1). In the West, finally, no resident volunteered for a follow-up interview.

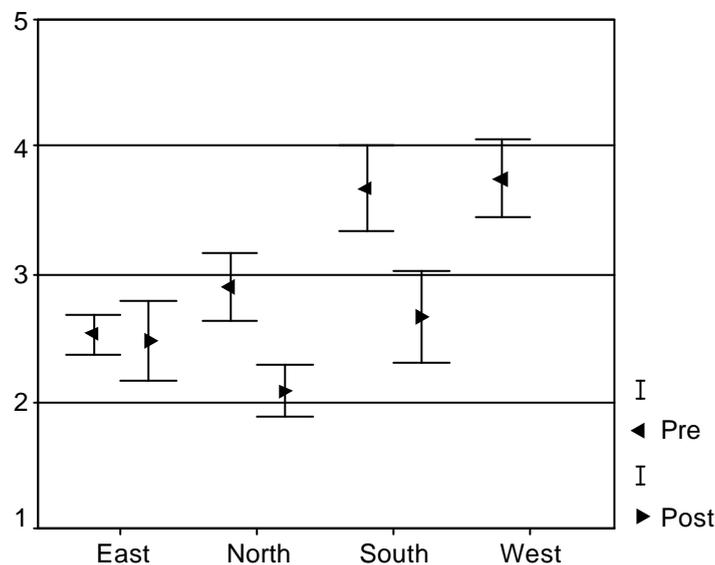


Figure 1: Mean annoyance through helicopter noise  $\pm$  standard error before and after introduction of the Heli-Scheduler. The South was closest to the helicopter operation area ( $n=183$  pre- and 79 post-interviews).

This result was confirmed by the users of the noise telephone (Figure 2): The people calling from the South and living near the helicopter operation area noticed a “medium” change in helicopter noise, while the others perceived it “not” or only “little” different compared to the situation before installation of the Heli-Scheduler. This observation was statistically significant ( $F_{3,57}=3.756$ ;  $p=0.016$  in a one way analysis of variances). Post-hoc t-tests localised the effect in

the comparison South-East ( $p_{\text{south,east}}=0.025$ ) and South-North ( $p_{\text{south,north}}=0.043$ ), while the South-West difference failed significance ( $p_{\text{south,west}}=0.840$ ).

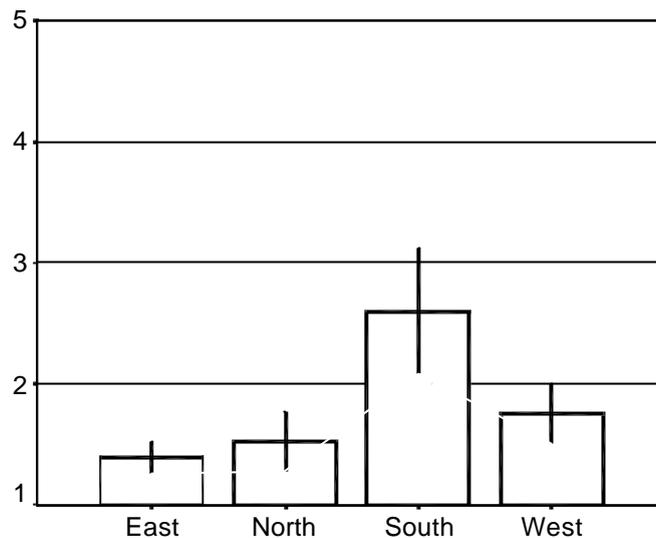


Figure 2: Mean noticed change in helicopter noise  $\pm$  standard error after introduction of the Heli-Scheduler ( $n=63$  noise line users).

When asked whether there is anything else to be done with the helicopter operations, 66% of the residents mentioned no further wishes. However, with respect to the noise of air planes, less flights in general (14.6%), changes of flight routes (9.8%), less flights on weekends (4.9%), no airport extension (2.4%), and the closure of the airport (2.4%) were desired.

In all investigation areas, the residents were only a “little” satisfied with the airport management, as well in the pre- (mean  $\pm$  standard error  $2.1 \pm 0.2$ ) as in the post-interview ( $2.2 \pm 0.1$ ). These findings point out that even though people in the North and the South were less annoyed after introduction of the Heli-Scheduler, they are still not satisfied. Satisfaction with the airport management might not have been improved, because the Heli-Scheduler was unknown to most people and they did not know that the airport was taking measures to control the noise.

Furthermore, people were asked whether the translation of their proposals into action could change their attitude towards the airport. This was rated with a tendency to “medium” probable ( $2.6 \pm 0.2$ ), indicating that after all there is still hope for further rapprochement.

## CONCLUSION

Considering the specific helicopter problem at Augsburg regional airport, the Heli-Scheduler was an effective measure towards a better neighbourhood between airport and residents. On the one hand, it significantly reduced annoyance due to helicopter noise in the South and in the North. On the other hand, it showed that the airport management is not only thinking of economical benefits but also taking measures to control noise and protect the residents. However, it seems necessary to inform the public about these measures in order to get even more positive responses. The installation of noise abatement procedures and their communication to the public thus could lead to an open and honest dialogue and reduce the prevalent mistrust.

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