

**Department of Transportation**  
**Federal Aviation Administration Office of Environment and Energy**

**SUPPORTING STATEMENT**

**Supporting Statement for a New Collection RE:  
Neighborhood Environmental Survey  
OMB Control Number 2120-XXXX**

**INTRODUCTION**

This information collection is submitted to the Office of Management and Budget (OMB) to request a three-year approval clearance for the information collection entitled Neighborhood Environmental Survey, (OMB Control No. 2120-XXXX)

**Part A. Justification**

**1. Circumstances that make collection of information necessary.**

Currently, the FAA defines significant noise as a Day-Night Average Sound Level (DNL) of 65 decibels (dB) or more. In 1979, through the *Aviation Safety and Noise Abatement Act (ASNA) of 1979*, FAA implemented the ASNA's provisions in Part 150. This regulation adopted the DNL metric and the 65 dB land use compatibility guideline. DNL 65 dB was chosen because it balanced environmental goals with technical and economic feasibility. In 1992, the Federal Interagency Committee On Noise (FICON) reevaluated DNL and 65 dB and confirmed their continued use for stated purpose. This was the last in-depth government agency review on the metric and measure. In addition, even though DNL 65 dB contours around airports have decreased significantly over last 30 years, community opposition and challenges regarding aircraft noise have increased. The FAA believes this is due in part to changes in the nature of aircraft operations. Although the vast majority of the commercial airline fleet is newer and significantly quieter, the sheer *number* of flight operations (particularly at the largest and busiest airports) has increased significantly over the last 30 years.

The FAA currently uses the “Schultz Curve” (Schultz 1978)<sup>1</sup>, which was created based on multiple modes of transportation and surveys collected using different survey instruments at different times. Re-examination of the data shows that if aviation is examined separately, the percent of people highly annoyed was higher at DNL 65 dB than specified in the Schultz curve which included rail and street traffic noise surveys in addition to aviation noise surveys (Woodward et al., 2009). The Schultz curve was constructed using eleven existing surveys that had been conducted before 1974, and none of these surveys involved aircraft noise from U.S. airports. The surveys had different designs, questionnaires, and annoyance scales.

More recent surveys of airport communities have been done largely on a case-by-case basis; surveys performed up to 1991 are cataloged in Fields (1991). A number of these surveys have

<sup>1</sup> Formalized by FICON (1992); FICON refit the data used by Schultz with a logistic regression model, and arrived at a curve with very similar shape within the range of aviation noise commonly encountered.

been performed to evaluate the effects of specific events such as runway repairs or noise abatement procedures (Fidell et al., 1985). Other surveys of airport communities are summarized in Fidell et al. (2011). The largest systematic, scientific study of multiple airports in the U.S. was conducted between 1967 and 1971 at nine airports (the TRACOR study, described in Connor and Patterson, 1976). This study found substantial differences among airports. Investigations in Europe have shown that the relationship between noise exposure and annoyance has changed over time; Janssen et al. (2011) document that there has been a highly significant increase in annoyance over the years at a given level of noise exposure.

This Neighborhood Environmental Survey is necessary to update the relationship between aircraft noise exposure and its effects on communities around U.S. airports. This survey will collect data on annoyance from a representative sample of airports and households surrounding each of the airports in the study, and relate the annoyance level to the noise exposure for that address. The 20 airports selected for the study represent a wide range of conditions with respect to number of operations, nighttime operations, temperature, population in proximity to the airport, and fleet mix, and the results from the study can be generalized to the relevant population of U.S. airports. The same survey instruments and data collection procedures will be used for all of the airports, and the survey will be conducted during the same time period at all airports. These uniform procedures will result in data that can be compared across airports and that can be used to construct a national dose-response curve relating annoyance levels to aircraft noise exposure.

The Federal Aviation Administration will use the information from the survey to derive the empirical guidance to support the development of the national civil aviation noise policy to determine whether there is a scientific basis to either validate or potentially update community noise impacts and land-use guidelines around airports according to 14 CFR Part 150, and mitigation action.

A pilot study on this topic has been conducted through the National Academy Transportation Research Board Airport Cooperative Research Program (ACRP) entitled “Research Methods for Understanding Aircraft Noise Annoyance and Sleep Disturbance,” Problem No. 10-02-35. This study is described in Section B.4.

In 1979, through the *Aviation Safety and Noise Abatement Act (ANSA) of 1979*, FAA implemented the ANSA's provisions in Part 150. This regulation adopted the DNL metric and the 65 dB land use compatibility guideline.

The provisions of 49 U.S.C. 47501 et. seq (Aviation Safety and Noise Abatement Act) and 14 CFR Part 150 requires after consultation with agencies “that the Secretary of Transportation considers appropriate, the Secretary shall by regulation— (1) establish a single system of measuring noise that—

(A) has a highly reliable relationship between projected noise exposure and surveyed reactions of individuals to noise...” (APPENDIX 1)

There is evidence that annoyance reactions vary community to community (Fields et al 2000) and airport to airport (Fidell et al 2011), and may be affected by survey methodology (Maarten et al 2013). Considering these sources of variability as well as past surveys using different methods for determining noise exposure, use of the non-U.S study results to apply to U.S.

airports and possibly to FAA policy decisions is judged inappropriate.

The proposed research will establish a reliable and updated relationship between exposure and surveyed reaction of individuals to noise. A single survey instrument will be used for all airports and households surveyed, and a single method for determining noise exposures; contrast to previous studies, which relied on existing surveys with different instruments. Much of the previous data on reactions to aircraft noise was collected in the period between 1960 and 1985, and the proposed study will allow assessment of responses to current airport conditions.

## 2. How, by whom, and for what purpose is the information used.

The Federal Aviation Administration will use the information from this collection to derive the empirical guidance to support potential updates to or validation of the national aviation noise policy, to determine of community noise impacts, land-use guidelines around airports according to 14 CFR Part 150, and abatement and mitigation action.

## 3. Extent of automated information collection.

Data collection will be conducted using both a paper mail survey and a computer-assisted telephone interview (CATI). The mail survey will provide the primary measure of estimating the dose-response curve. Conducting a web survey, rather than a mail survey, would not permit adequate coverage of those that do not have access to the web (Dillman et al, 2008; Messer and Dillman, 2011). In addition, mail surveys yield significantly higher response rates than web surveys (Manfreda, et al, 2008; Millar and Dillman, 2011; Dillman, et al., 2008)). Some consideration was given to providing the respondents a choice between a paper mail and a web survey. This was rejected because a number of studies have found that giving respondents a choice depresses response rates (Dillman, et al., 2008).

For the mail survey, an information technology system will be used to track respondents and to record, store and maintain the data.

The telephone survey will be conducted with an interviewer being assigned eligible households via an electronic call scheduling system. This system prioritizes calls to occur when the respondent is most likely to be at home and it allows the interviewer to set appointments for any time that is convenient to the respondent. As the interview proceeds, the responses are entered directly into the database by the interviewer. These data are then stored in a centralized database that is used for analysis.

## 4. Efforts to identify duplication.

Since noise is typically the most immediately objectionable community impact of aviation, it is critical to collect updated community annoyance data. Failure to update data and relationships will cause FAA to continue to rely on data that is at least 30 years old and continue to have the public and members of Congress question the validity of the current level of significance.

The currently used relationship between transportation noise exposure and noise is based on data

collected primarily in 1960's and 1970's from variety of countries. There are multiple indications that people's perception of noise has changed as well as has typical noise exposure around American airports. In addition, even though DNL 65 dB contours have decreased significantly over last 30 years, opposition and challenges regarding aircraft noise have not. Finally, in the last 15 years, multiple studies (see Miedema et all 2001, Medema et all 2998, Janssen et all 2011) have created additional dose-response curves which have shown a shift from the current Schultz (1979) Curve. (see, for example, Miedema and Vos, 1998, Groothuis-Oudshoorn and Miedema, 2006, Brink et al., 2008, and Janssen et al., 2011). These studies, however, are conducted using multiple survey modes and instruments, and many of the most recent surveys have been conducted in Europe.

Previous surveys on reactions to aircraft noise in the U.S. have been conducted using different survey instruments and procedures, and were conducted on purposively chosen sets of airports. The most recent systematic study of airports was the TRACOR study described above, which took place around 1970. Airport operations (and possibly community reactions) have changed since 1970, and this survey is necessary to update the relationship between aircraft noise exposure and its effects on communities in the U.S.

#### 5. Efforts to minimize the burden on small businesses.

This effort will not impact small businesses or other small entities.

#### 6. Impact of less frequent collection of information.

Previous surveys on reactions to aircraft noise in the U.S. have been conducted using different survey instruments and procedures, and were conducted on purposively chosen sets of airports. The most recent systematic study of airports was the TRACOR study described above, which took place around 1970. Airport operations (and possibly community reactions) have changed since 1970, and this survey is necessary to update the relationship between aircraft noise exposure and its effects on communities in the U.S.

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## 7. Special circumstances.

### **EXPLAIN ANY SPECIAL CIRCUMSTANCES THAT WOULD CAUSE THIS INFORMATION COLLECTION TO BE CONDUCTED IN A MANNER:**

- **REQUIRING RESPONDENTS TO REPORT INFORMATION TO THE AGENCY MORE OFTEN THAN QUARTERLY;**  
No participant will be asked to provide information more often than quarterly. Participation will be a one-time event.
- **REQUIRING RESPONDENTS TO PREPARE A WRITTEN RESPONSE TO A COLLECTION OF INFORMATION IN FEWER THAN 30 DAYS AFTER RECEIPT OF IT;**  
We are requesting that mail surveys are completed within 2 weeks of receipt. However, this is not a mandatory request. It is intended to convey the time frame under which the study is operating. This follows standard procedures as followed in Dillman et al (2008).
- **REQUIRING RESPONDENTS TO SUBMIT MORE THAN AN ORIGINAL AND TWO COPIES OF ANY DOCUMENT;**  
No participant will be asked to submit more than the original copy of the data collection instrument.
- **REQUIRING RESPONDENTS TO RETAIN RECORDS, OTHER THAN HEALTH, MEDICAL, GOVERNMENT CONTRACT, GRANT-IN-AID, OR TAX RECORDS FOR MORE THAN THREE YEARS;**  
No participant will be asked to retain records for more than three years.
- **IN CONNECTION WITH A STATISTICAL SURVEY, THAT IS NOT DESIGNED TO PRODUCE VALID AND RELIABLE RESULTS THAT CAN BE GENERALIZED TO THE UNIVERSE OF STUDY;**  
No invalid statistical survey is anticipated.
- **REQUIRING THE USE OF A STATISTICAL DATA CLASSIFICATION THAT HAS NOT BEEN REVIEWED AND APPROVED BY OMB;**  
No unapproved data classification activities are anticipated.
- **THAT INCLUDES A PLEDGE OF CONFIDENTIALITY THAT IS NOT SUPPORTED BY AUTHORITY ESTABLISHED IN STATUE OR REGULATION, THAT IS NOT SUPPORTED BY DISCLOSURE AND DATA SECURITY POLICIES THAT ARE CONSISTENT WITH THE PLEDGE, OR WHICH UNNECESSARILY IMPEDES SHARING OF DATA WITH OTHER AGENCIES FOR COMPATIBLE CONFIDENTIAL USE; OR**  
All pledges are supported by the authority established in statute or regulation.
- **REQUIRING RESPONDENTS TO SUBMIT PROPRIETARY TRADE SECRET, OR OTHER CONFIDENTIAL INFORMATION UNLESS THE AGENCY CAN DEMONSTRATE THAT IT HAS INSTITUTED PROCEDURES TO PROTECT THE INFORMATION'S CONFIDENTIALITY TO THE EXTENT PERMITTED**

**BY LAW.**

No trade secrets or items of similar confidential information will be requested.

8. Compliance with 5 CFR 1320.8:

A notice was published in the Federal Registry on June 12, 2014 (vol. 79, no. 113, pgs. 33797-33798).

There were seven responses to this notice. The notice received comments from the Airlines for America (A4A), Village of Schaumburg, Illinois residents, City of Wood Dale Illinois residents, and several other private citizens representing themselves.

The notice received several positive comments stating that: this survey is “absolutely necessary to update relationship between aircraft noise exposure and its effect on communities around United State airports.” There were clarifying questions on survey background in general, questionnaire content, method of airport selection and participants’ selection.

Since the time of the Federal Registry publication the National Academy of Sciences ACRP project final report is available on line at:  
[http://onlinepubs.trb.org/onlinepubs/acrp/acrp\\_webdoc\\_017.pdf](http://onlinepubs.trb.org/onlinepubs/acrp/acrp_webdoc_017.pdf). This report includes result of national survey methodology development and results of pilot testing of this methodology in three American airports.

There were four key issues: 1) The sample size of 500 residence per airport is inadequate, 2) an in-person survey is best for all data quality criteria considered in comparison with proposed mail and telephone survey combination, 3) potential nonresponse bias, and 4) a twenty minute telephone survey duration is too long.

Issue 1:

The number of airports and sample size for each airport were selected to allow accurate estimation of the curve describing the national relationship between percent highly annoyed and noise exposure, and the calculations of estimated precisions in the OMB submission demonstrate that they are expected to achieve this goal. There are two components to the variance of the estimated curve: the first is the variability among respondents within an airport community, and the second is the differences from one airport to another. Increasing the number of respondents for one particular airport community only addresses the first source of variability: increasing the number of airports reduces both sources of variability. Having 20 airports, rather than 3 airports as in the ACRP study, allows the relationship to be estimated precisely using a smaller sample size within each airport community. For estimating the national relationship, increasing the number of addresses per airport beyond the 500 mail survey responses used to develop the curve results in very small increases in precision.

Issue 2:

Costs for an in-person survey run approximately 10 times higher than a mail survey. Given the amount of money to be spent on the data collection, an in-person survey would lead to significantly smaller sample sizes and inadequate precision to estimate the noise-annoyance curve. There was no evidence from the ACRP report that mail surveys lead to higher estimates than an interviewer-administered survey, as illustrated by the equivalence of the mail survey and telephone survey results.

#### Issue 3:

The ACRP conducted several different tests for non-response bias. One was to conduct a response propensity analysis, which correlated socio-demographic characteristics and noise levels to response. This analysis did not find any evidence that noise level was related to non-response, which would be expected if the pattern noted in the question were significant. A second analysis compared the annoyance levels of the mail and telephone surveys. The mail survey had a response rate that was about three times as high as the telephone survey, but no differences in annoyance were found between the two modes. If those choosing to not respond are less annoyed, we would have expected a large difference in annoyance. Given the lack of any evidence of non-response bias, the proposed design is following the recommendation of the ACRP report by putting more resources into increasing the response rate to the mail survey by using incentives, express mail delivery and distributing a Spanish questionnaire. All of these measures have been proven to be effective in improving response rates.

#### Issue 4:

For a scientific survey administered by the Federal government, a 20 minute survey is not unusually long. Unlike a survey sponsored by a private organization (e.g., a marketing firm; private pollsters), respondents are quite willing to answer questions about their community if they believe the answers will contribute to informed policy. This is illustrated by such government surveys like the California Health Interview Survey, which is more than 20 minutes long and gets a response rate of around 20 percent. On the previous ACRP test survey of three airports, there were very few people who hung-up once they began the survey. Most of the nonresponse was similar to all other telephone surveys, with respondents either not picking up the phone or hanging up immediately once the interviewer began speaking (before the person knew about the purpose of the call or the length of the interview).

The ACRP study developed and validated a survey instrument to acquire dose-response data from several airport communities. The survey questionnaires were reviewed by independent experts. The ACRP report was published in July 2014.

In addition, an update on the status of this work was presented in June 2014 at the 11th International Congress on Noise as a Public Health Problem (ICBEN), Nara Japan.

Also, the project has been reviewed through both the environment and energy and airports subcommittees of the FAA's Research, Engineering and Development Advisory Committee (REDAC) on a bi-annual basis since the project began.

Finally, the FAA has been informing the Federal Interagency Committee on Aviation Noise (FICAN) on progress of the work. In addition, FICAN has reviewed certain aspects of the work (such as selection of the airports) for appropriateness.

Information gained through the ACRP project has been incorporated into the study design for the national study. Information such as response rates gathered through the ACRP project was used to inform the national study. Information gathered through the REDAC, FICAN, and the ICBEN conference has been/will be reviewed and incorporated as appropriate. The survey instruments are similar to those that were used in the ACRP study, with final modifications made to the instruments by an FAA committee.

Data will be collected only one time.

#### 9. Payments or gifts to respondents.

We are proposing two types of incentives for participants in the study. We propose to include a \$2 incentive in the first mailing of the mail survey questionnaire package. Pre-paid incentives of this size have been shown to significantly increase response to mail surveys (Church 1993; Dillman, Smyth, and Christian 2008; Edwards, et al, 2005). In a recent meta-analysis of incentive experiments, for example, Mercer et al (2014) found incentives of this size to increase response rates by approximately 10 percentage points for a mail survey.

For respondents selected for the telephone survey, we propose to offer a \$10 incentive, paid after the survey is completed. An incentive is necessary because we are requesting additional participation from the household. Promised incentives on telephone surveys have been found to be effective in improving response (Singer, et al, 1999). The meta-analysis by Mercer et al (2014), for example, predicts this amount would increase response rates by approximately 5 percentage points.

#### 10. Assurance of confidentiality:

Volunteers who participate in this study will be told that “The information you provide will be maintained confidential to the extent allowed by law.”

Westat, the study contractor, has its own policy and procedures regarding assurance of confidentiality and a pledge that all employees must sign. Westat provides all safeguards mandated by Privacy and Confidentiality Acts to protect the confidentiality of data gathered for this study. Westat data security procedures comply fully with procedural safeguards for computerized records as outlined in the U.S. Department of Health and Human Service’s *General Administrative Manual* under “Safeguarding Records Contained in Systems of Record” and specified by the National Institute of Standards and Technology Federal Information Processing Standards (FIPS).

This study will be submitted to the FAA Office of Human Subjects Review. Westat has its own internal IRB under provisions specified by its multiple project assurance plan.

Personally identifiable information (PII) will be collected as part of this data collection effort. All selected households will be assigned a study ID. The study management system (SMS) will contain both the selected household’s address and the study ID, but no names. Data is maintained in a separate database from the SMS or address information. Only a limited number of Westat project staff will have access to the SMS. The SMS will be maintained on a restricted-access drive within the Westat firewall. Completed paper questionnaires will be kept in a locked location. Once scanned, data will be maintained on a secured database within the Westat firewall and will be accessible by only a limited number of Westat project staff. Data will be identified only through the study ID. No names or identifiers will be used in reports or delivered to the FAA as part of the final dataset.



11. Justification for collection of sensitive information:

The survey will not include any questions of a sensitive nature.

12. Estimate of burden hours for information requested:

The hour burden for the Neighborhood Environmental Survey is shown in Tables A12-1 and A12-2 below. The mail questionnaire will take approximately 5 minutes (.08 hours) and the telephone instrument approximately 20 minutes (.33 hours) to complete. These estimates are based on experience using these instruments in a pilot study (see Section B.4). We anticipate the Neighborhood Environmental Survey instruments to be very similar in length as those in the pilot.

The total estimate of respondent burden is 1,544 hours annually in 2015. The annualized cost is calculated with a wage rate of \$23.98 per hour for 1,544 burden hours (CES-National, 2013) and is estimated to be \$37,025.

Table A12-1. Estimate of respondent hour burden

Type of respondent	Number of respondents	Frequency of response	Average time per response minutes/hour	Annual hour burden
Mail survey	10,007	1	5/60 (.083)	831
Telephone survey	2,140	1	20/60 (.333)	713
<b>Total</b>	<b>12,147</b>			<b>1,544</b>

Table A12-2. Annualized cost to respondents

Type of Respondent	Number of respondents	Frequency of response	Average time per response	Hourly wage rate	Respondent cost
Mail survey	10,007	1	.083	\$23.98	\$19,927
Telephone survey	2,140	1	.333	\$23.98	\$17,098
<b>Total</b>					<b>\$37,025</b>

13. Estimate of total annual costs to respondents.

The cost burden on respondents and record-keepers, other than burden hours, is zero.

14. Estimate of cost to the Federal government.

Based on the current Neighborhood Environmental Survey budget, the total cost to the Federal Government for the proposed survey is \$1,634,235 for the 1 year period from January 1, 2015 to December 31, 2015. This amount includes all direct and indirect costs of the design, data collection, analysis, and reporting phases of the study, as well as the production of public-use and restricted data sets. The annual costs of Federal employees for monitoring the contract are estimated to be \$1,039,802. These costs are based on 30 percent of the Project Officer's time, 30 percent of an individual's time to support ongoing data analysis and to coordinate the Neighborhood Environmental Survey program, as well as an additional 1 FTE that includes several FAA staff who contributed to the content of the instrument.

15. Explanation of program changes or adjustments.

This is a new collection, therefore it is a program change.

16. Publication of results of data collection.

The product of this work will be summary data reports on level of people annoyed by aircraft noise versus noise level. Only statistical summaries of the information will be published and no personally identifiable information will be disclosed. The analysis will be completed through a regression analysis for the dose-response data. See Supporting Statement B on details of dose-response regression. We plan to collect data from January 1, 2015 – December 31, 2015. The data analysis will be done through the first six months of 2016 with the final report being published in mid-2016.

17. Approval for not displaying the expiration date of OMB approval.

We are not seeking such approval.

18. Exceptions to certification statement.

There are no exceptions to the certification statement.

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