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# PRELIMINARY EVALUATION OF THE EFFECT OF A DYNAMIC PREFERENTIAL RUNWAY SYSTEM UPON COMMUNITY NOISE DISTURBANCE

By Harrold P. Patterson,
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Prepared under Contract No. NASW-2293 by
TRACOR, Inc.
Austin, Texas

for

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C.

7 February 1972



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# SUMMARY

A dynamic preferential runway system (DPRS) was developed by TRACOR for John F. Kennedy International Airport for the purpose of controlling short-term noise exposure in the neighboring communities. The DPRS is a computer-aided procedure for optimum selection of runways from the standpoint of noise and is based upon a community disturbance model which takes into account flyover levels, size of exposed populations, time of day and week, and persistence of overflights.

This report documents a preliminary evaluation of the DPRS on the basis of social survey data and telephone complaint records, for the DPRS trial period of August and September, 1971. It should be recognized at the outset that this evaluation is necessarily of an indicative rather than definitive nature because of uncontrolled variables. In the analysis, comparative use is made of data taken in a previous survey of the same community areas in 1969 under Contract NASW-1549.

Salient results of the analysis were as follows:

1) The incidence of high annoyance due to aircraft noise disturbance was 63 percent in 1969 and 71 percent in the 1971 trial period; the incidence of high fear of aircraft crashing was 51 percent in 1969 and 55 percent in 1971.

2) The number of telephone complaints about various aspects of aircraft noise was substantially lower in 1971, especially during the DPRS trial period, than in 1969.

3) Various attitudes regarding the airport, air transportation, associated officials and agencies, and aircraft noise itself were less favorable in 1971 than in 1969.

These results are interpreted as generally favorable toward the DPRS. However, the two-month trial period was too short for an adequate evaluation in view of various experimental problems. Therefore further use of the DPRS is recommended, together with continuing evaluation and eventual further development.

# INTRODUCTION

Late in 1969, the Aviation Development Council asked TRACOR to study the possibility of improving the Preferential Runway System at John F. Kennedy International Airport. The most immediate result of this study was a slightly modified Preferential Runway System, used at the airport for the summer of 1970. However, in the report to ADC TRACOR also recommended investigation of a Dynamic Preferential Runway System. As a result of that report, the Federal Aviation Administration and the Port of New York Authority jointly sponsored a contract with TRACOR to install an experimental Dynamic Preferential Runway System at Kennedy Airport for a trial period during the summer of 1971. This system represents a significant conceptual departure from previous preferential runway systems. Where previous systems always were conducive to overflight of the least sensitive (i.e., least populated) communities, the Dynamic Preferential Runway System uses a cogent model of community disturbance and encourages use of runways which will minimize disturbance in individual communities, particularly in terms of excessive short-term exposure. TRACOR felt that if it could be demonstrated that such a system significantly reduced annoyance or any other community disturbance indicator, the system has application in many airports throughout the world. Since the system is also very economical in comparison to other noise abatement possibilities, the concept seemed to warrant serious investigation. TRACOR requested and obtained from the National Aeronautics and Space Administration funding to investigate community reaction to the trial system installed at Kennedy Airport. This report documents the results of that investigation. The work was performed between 1 August 1971 and 31 January 1972 under Contract NASW-2293.

## Dynamic Preferential Runway System (DPRS)*

The DPRS is a computer-aided procedure for determining the optimum mode of airport operation at any time from the standpoint of community noise. By mode of operation is meant the combination of runways used for arrivals and departures. Preferential runway systems, which are basically noise abatement priority listings of available operating modes, are widely used. The addition of the word "dynamic" in the DPRS reflects the distinction that there is no fixed priority, but rather an order of preference which changes according to past and probable future community exposure conditions.

The DPRS is physically embodied in a small computer with Teletype located in the control tower. Data on aircraft operations, wind conditions, and wind predictions are read into the system periodically. Upon interrogation the system prints out a currently optimum listing of operating modes for various wind conditions. This listing is delivered to the controller, who can then readily determine the best choice of runways. Operations data from the existing CATER system include (for the purposes of the DPRS) time of day, runway used, and type of operation, i.e., arrival or departure, for each aircraft operation at Kennedy Airport. These are transferred by paper tape. Weather data, which are transcribed remotely to the tower location, consist of the predicted wind direction and speed for 3, 6, 9, and 12 hours in the future. The DPRS interprets these data in terms of community noise disturbance, according to a model discussed, and ranks the existing possible choices of airport operating mode in order of increasing probable disturbance.

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*Full details concerning the development, installation, and operation of the DPRS at Kennedy Airport can be found in Reference 1.

## Community Disturbance Model

The basic element of the DPRS is a model for the disturbance in each area of the community, incorporating all of the factors known to be related to general disturbance. These factors, which will be discussed individually, include for every flyover the time of day and week, the noise levels produced and the number of persons exposed to those levels, and the disturbance caused by previous flyovers. If all these factors are properly taken into account, the best choice of runways from the noise standpoint can be determined. The DPRS does this and also simplifies the selection process by recognizing load capacities and probable traffic loads. The DPRS computer thus serves as a specialized accounting and selection device, the purpose of which is to indicate the optimum choice of runways and at the same time relieve the controller of unnecessary work.

Figure 1 is a diagram of the community disturbance model. In the Kennedy DPRS this model is applied to each of four principle community zones lying under the flight paths of the four major runways. The input to the model is a FLYOVER EVENT affecting the community in question; this is specified as to time of occurrence and type, i.e., approach or departure. If operations are frequent then the input rate is high. The TIME OF OCCURRENCE FACTOR reflects the fact that people are more sensitive to aircraft flyover noise at certain times of the day or week. The weightings used in the present DPRS are given in the following table:

| Hours | Weekends and holidays | Other days |
|---|---|---|
| 0700-1859 | 3 | 1 |
| 1900-2159 | 3 | 3 |
| 2200-0659 | 10 | 10 |

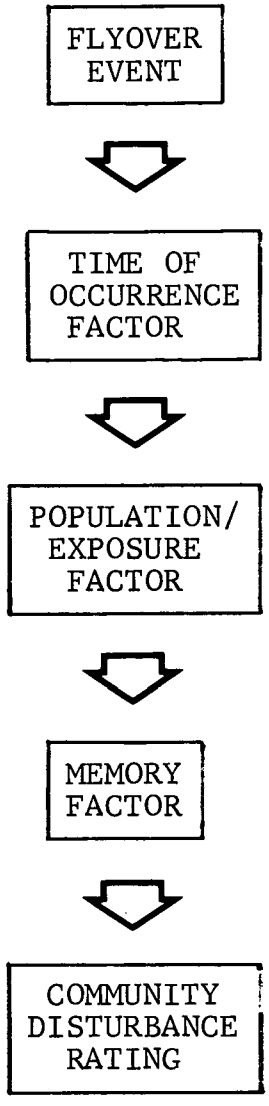


FIGURE 1 - ELEMENTS OF THE COMMUNITY DISTURBANCE MODEL

The POPULATION EXPOSURE FACTOR is present because different operations affect different numbers of people. The effect of a flyover on a given community is proportional to the disturbance of the prototype individual times the community population. Since not every person in the community is exposed to the same noise level, it is desirable to use a community weighting which reflects the composite disturbance of the community. The established EPNL contours for typical aircraft provide a basis for evaluating this weighting. Each person exposed to an individual EPNL of 100 EPNdB perceives twice as much noise as a person exposed to 90 EPNdB and four times as much as a person exposed to 80 EPNdB. From this property of EPNL we can define the community sensitivity weighting as

$$W = \int_S \rho(x, y)\, N(x, y)\, dxdy$$

where $\rho(x, y)$ = population density at latitude x, longitude y
$N(x, y)$ = effective noy value of a flyover at (x, y)
= antilog [(EPNdB - 40)/33.2]
S = area covered by the community

In practice this weighting was calculated in the following way:

$$W = P_{90} * 1 + P_{100} * 2 + P_{110} * 4 + P_{120} * 8 + P_{130} * 16 + \ldots$$

where $P_L$ = population within the (L) EPNdB contour but not within the (L + 10) EPNdB contour. There are separate weightings for arrivals and departures.

The final operative element, the MEMORY FACTOR, is of particular importance. The effect of a particular flyover is dependent upon preceding flyovers, i.e., upon past exposure.

Disturbance potential is believed to increase after an uninterrupted series of flyovers and to decrease during a respite period. Thus the total effect of a given number of flyover events is a function of the temporal pattern of exposure. The significance of this fact is that, by optimizing this pattern, community disturbance may be decreased without decreasing the total number of aircraft operations. In order to do this, however, it is necessary to incorporate a kind of memory into the system which simulates the hypothesized human reactions. The DPRS provides this in terms of the temporal function shown in Figure 2. Each flyover event is weighted by this function according to the time in the past at which it occurred. Remote events carry less weight as they are "forgotten." On the other hand, a succession of recent events tends to maximize the weighted sum of flyover events. The time period over which such a continuing succession occurs is called the "dwell." It has been observed that long dwells are strongly associated with community complaints. (See Reference 2.)

The community disturbance model thus provides a means of continuously computing the present disturbance in each community around the airport. It also is the basis for assessing the effect of continuing operations depending upon which runways are used. In the DPRS at Kennedy Airport an overall rating of disturbance for all four major communities is computed using the criterion that the disturbance in any one community should not greatly exceed that in another. This rating is evaluated by the DPRS for each possible airport operating mode for present and probable future conditions. The latter are based upon wind predictions for the next 3, 6, 9, and 12 hours, each successive set of predictions being discounted by half in the overall disturbance rating to account for decreased reliability. The overall rating, proportional to the variance of the separate community ratings summed over the prediction period, is the basis for rank ordering the

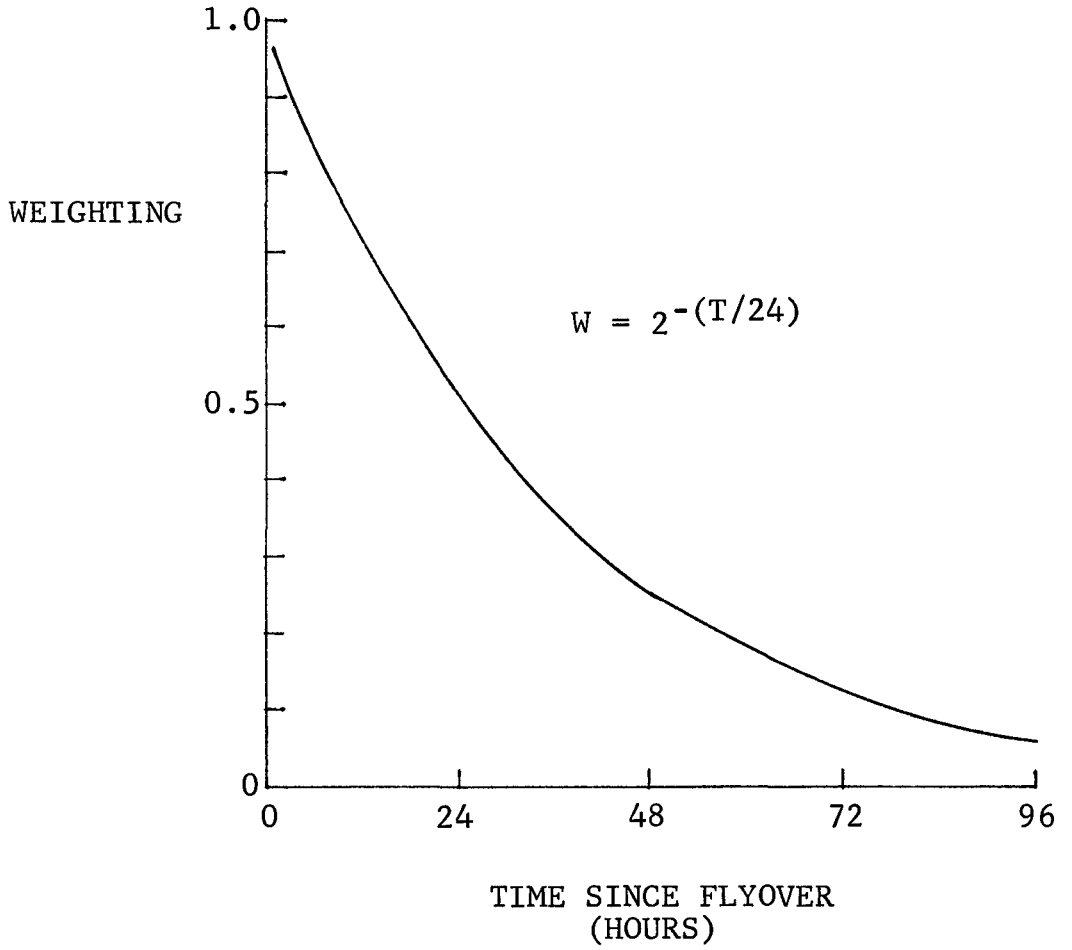


FIGURE 2 - TEMPORAL FUNCTION FOR MEMORY

possible operating modes for present use. As an additional function, the DPRS monitors actual traffic load versus time of day and causes operating modes with insufficient traffic capacity to be so noted on the printouts.

# PROCEDURE

## Data Acquisition

For purposes of evaluation, TRACOR examined two types of community reaction data. The first type was from a community survey in August and September of 1971 very similar to one performed for NASA in the summer of 1969 under Contract NASW-1549 The second consisted of telephone call complaint records kept by the FAA Noise Abatement Office at Kennedy Airport. Additional telephone complaint records were obtained from the Port of New York Authority but were used only for the section of this report called "An Overview of Complaint."

The 1969 community survey of areas around Kennedy Airport was part of a nationwide TRACOR survey which investigated community reactions to aircraft noise in terms of physical, psychological, and sociological variables. Interviews with residents living within the sample areas (wedge-shaped sectors extending ten to twelve miles along each flight path) were conducted during the summer "complaint season." In New York 1,070 interviews with randomly selected respondents were conducted in 1969. (See Reference 3.)

In order to obtain longitudinal data, a second, parallel survey was conducted in August and September of 1971. This smaller survey (N = 441) was similar in many respects to the 1969 survey. The 1969 sampling plan was re-used; however, alternate blocks within census tracts were chosen so that no census block which was used in 1969 was re-used in 1971. A shortened form of the original questionnaire was used and identical interviewing procedures were followed. (See Appendix B.) This identity was enhanced by rehiring interviewers used in the 1969 survey. That the two survey samples are parallel is evident by the fact that the percentage of the total interviews in each census tract in the 1971 survey differed by less than one point from that in the

1969 survey. Thus, even though the grand totals for each survey are different, the results can be compared on a longitudinal basis.

In addition to survey data, telephone call records of the FAA for 1969 and 1971 (June, July, August, and September of each year) were examined. Whenever a person called complaining about some aspect of aircraft operation, a written record was made by the FAA. This record noted the name and address of the caller, the time and date, and the specific complaint.

In all, the data for this evaluation were obtained from 1,070 interviews and 1,945 complaint records from 1969 and 441 interviews and 1,243 complaint records from 1971.

## Analysis Variables

From the surveys the variables of interest for this evaluation are complaint action, complaint potential, annoyance, fear, adaptability, misfeasance, importance, and noise susceptibility. From the complaint records the variables are total complaints, repeat complaints, complaints about noise, complaints about dwell, and complaints about aircraft flying too low. Details for the construction of the survey variables can be found in Appendix A. Forms for complaint records are shown in Appendix C.

"Complaint action" means the respondent expressed his displeasure by direct overt action. "Complaint potential" means that the respondent only felt like doing something but did not take any direct action. Both complaint action and potential refer only to those individuals who said aircraft noise was the thing they most disliked in the neighborhood. For this reason the totals for these variables may be less than the total for the entire sample. "Annoyance" is a measure of the respondent's irritation

with aircraft disturbing his everyday activities. "Fear" measures the respondent's anxiety about the possibility of an aircraft crashing in his area. "Misfeasance" involves the attitude of the respondent toward those officials and authorities who presumably have responsibilities concerning the noise problem. The term "misfeasance" implies a belief that these people are not doing their job properly. "Importance" measures the respondent's affective feelings about the airport and the airline industry. "Noise susceptibility" indicates the respondent's perception (or nonperception) of the usual neighborhood sound sources.

"Total complaints" means the total number of complaints about any aspect of aircraft noise exposure received by the FAA Noise Abatement office at Kennedy Airport for the four months of June, July, August, and September. "Repeat complaints" refers to that portion of total complaints which are from individuals who called more than once in a given month. For example, if it is shown that 50 percent of all complaints are repeat complaints, then the number of complainants is not less than 50 percent or more than 75 percent of the total number of complaints. In this case 50 percent of the complaints represent individual complainants and the remaining repeat complaints may have been generated either by one complainant (theoretically) or, on the other extreme, by persons each of whom qualified as a repeat complainer by registering the minimum of two complaints. This means that people who had called two or more times compose half of the total. The other half is composed of individuals who called only once. A particular complaint was designated a repeat if that person had called any other time that month. Complaints about "noise" are those which mention the noise as a reason for calling (i.e., "noise," "loud," "can't hear TV," "shakes house"). Complaints about "low aircraft" refer to the disturbance caused by low overflight by particular aircraft (i.e., "low," "blows shingles off," "pilot spit at me"). Complaints about "dwell" are those which mention the lack of relief from continuous exposure to aircraft operations (i.e., "twenty-four hours straight now," "constant all day").

## Implications of the Procedure

Use of survey data for the DPRS evaluation imposes certain restrictions. Typically, the respondent's temporal frame of reference is unspecified. That is, the respondent is often asked to summarize his feelings or opinions from an unspecified point in the past up to the present. This allows the researcher to analyze certain constant aspects of the respondent's behavior.

Although this procedure is normally desirable, for the present evaluation it may interfere with the analysis. There are certain items, such as those regarding complaint, which ask the respondent if he had ever indulged in a particular activity, not if he only recently had done so. If we hypothesize that reaction to noise is in response to a cumulative stimulus, then a survey conducted concurrently with some change may not detect any corresponding change in reaction. In this connection, it should be emphasized that the 1971 social survey was initiated concurrently with the inauguration of the DPRS.

While the 1969 and 1971 surveys analyzed in this report are believed to accurately reflect the situations at those points in time, care must be taken not to infer situations at other times by "connecting the points." Any change observed between the two surveys must be interpreted only as a comparison of two data points and not as a continuous two-year increase or decrease. Surveys conducted in 1970 and 1972 might well yield a comparison completely different from that of the 1969 and 1971 surveys presented here.

The coding of telephone complaint content is done from actual FAA records. However, these records historically have not been kept for the purpose of this type of analysis and there has been no uniformity in the instructions given to personnel who take the calls. In practice, most of the records are made by answering

service personnel who may not have been employed during both summers. Therefore the contents of the records are certainly less consistently and accurately recorded than the questionnaire answers recorded by TRACOR-trained interviewers.

The wind statistics during the trial period may have influenced community exposure in terms of the DPRS disturbance model to a considerable extent, since actual and predicted wind conditions affect runway usage as inputs to the DPRS. One way to remove the possible effects of wind upon observed responses as obtained in this study is to make the period of observation sufficiently long that these effects average out. (In the pilot study for the Aviation Development Council, eleven summers of wind data were used.) Unfortunately, it was not possible to evaluate the DPRS over an extended period of time and the two-month trial period was so short that the situation may not have been very representative of that over an extended period. Another approach toward this problem is to reconstruct the situation during the trial period, on the basis of actual wind behavior, as it would have been using another runway selection procedure, and then compare the results with those actually observed. This type of evaluation has been proposed by TRACOR to the FAA and may provide further insight into the effectiveness of the DPRS.

## AN OVERVIEW OF COMPLAINT: 1968-1971

In the evaluations presented in other sections of this report, the time periods considered are relatively short. The purpose of this section is to examine complaints over a five-year span. For this reason data on telephone complaint calls to both the FAA and the Port of New York Authority (PONYA), which are the two main channels of communication, were compiled for the months of June, July, August, and September for 1968 through 1971. Data for the month of May (the start of the "complaint season") were not available. Even though the data are not detailed, they provide at least some idea of complaint trends for the time period under consideration.

Figure 3 shows the number of noise complaints received by FAA and PONYA during the noise seasons from 1968 through 1971. There is considerable month-to-month fluctuation, but it is obvious that 1971 had the best summer complaint season since 1968. Table 1 lists the number of complaints from each of four areas by month for the years 1968-1971. The areas here are labeled by the name of an included community, but each represents a general area exposed by departures or arrivals along similar flight paths in one direction. Data are less accurate on complaints before 1968. Since this report deals primarily with the period 1969-1971, further data on complaints will also be restricted to this period.

Table 2 shows the average number of complaints per month for each area for every two-month period in the noise season from 1969 to 1971. (However, the period of July-August 1971 is omitted because of the transition to the DPRS in August.) For each community, each two-month period is ranked according to increasing numbers of complaints. The next to last column gives the complaint rate for all communities (COMPOSITE), with the corresponding ranking. This column shows that for the airport community as a whole, the DPRS trial period of August and September 1971 has the lowest

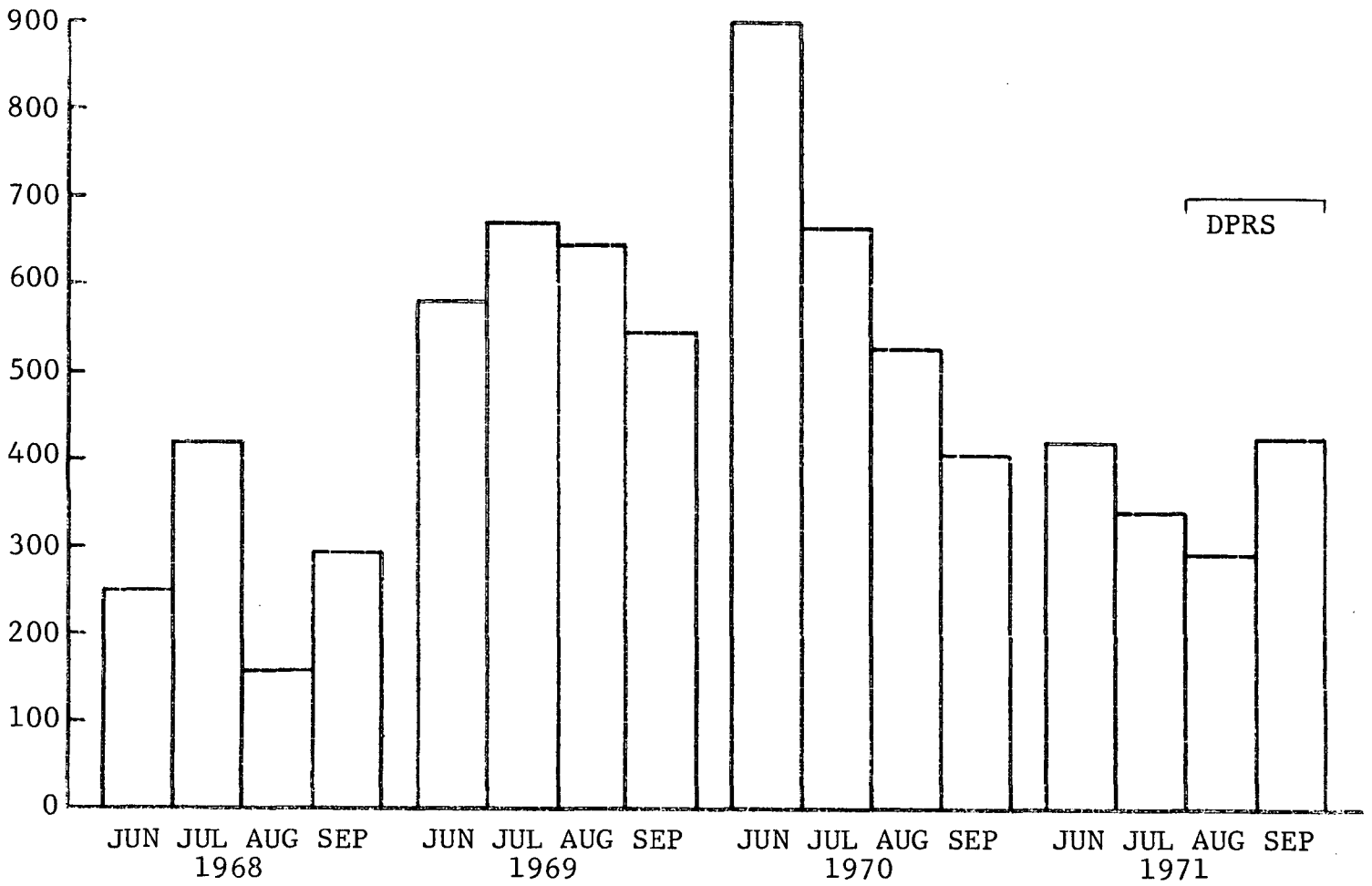


FIGURE 3 - NOISE COMPLAINTS RECEIVED BY FAA AND PONYA-
KENNEDY INTERNATIONAL AIRPORT

TABLE 1

COMPLAINTS RECEIVED BY FAA AND PONYA, BY COMMUNITY AND MONTH

| YEAR | MONTH | COMMUNITY | | | |
|---|---|---|---|---|---|
| | | ROSEDALE | FIVE TOWNS | ARVERNE | HOWARD BEACH |
| 1968 | June | 117 | 32 | 13 | 79 |
| | July | 203 | 45 | 22 | 143 |
| | August | 37 | 28 | 13 | 76 |
| | September | 115 | 38 | 8 | 132 |
| 1969 | June | 114 | 73 | 5 | 382 |
| | July | 108 | 119 | 32 | 387 |
| | August | 188 | 59 | 32 | 353 |
| | September | 83 | 39 | 19 | 379 |
| 1970 | June | 611 | 40 | 35 | 196 |
| | July | 349 | 44 | 18 | 240 |
| | August | 253 | 95 | 29 | 149 |
| | September | 226 | 32 | 31 | 115 |
| 1971 | June | 215 | 36 | 42 | 128 |
| | July | 111 | 45 | 49 | 135 |
| | August | 178 | 19 | 26 | 69 |
| | September | 208 | 52 | 13 | 151 |

TABLE 2

NUMBER OF COMPLAINTS PER MONTH BY COMMUNITY AND PERIOD

| YEAR | PERIOD | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | | COMPOSITE | | MEAN COMM RANK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | COMPL | RANK | COMPL | RANK | COMPL | RANK | COMPL | RANK | COMPL | RANK | |
| 1969 | JUN-JUL | 111 | 1 | 96 | 8 | 18 | 1 | 384 | 8 | 610 | 6 | 4.5 |
| | JUL-AUG | 148 | 3 | 89 | 7 | 32 | 7 | 370 | 7 | 639 | 7 | 6.0 |
| | AUG-SEP | 135 | 2 | 49 | 4 | 25 | 4 | 366 | 6 | 576 | 4 | 4.0 |
| 1970 | JUN-JUL | 480 | 8 | 42 | 3 | 26 | 5 | 218 | 5 | 766 | 8 | 5.3 |
| | JUL-AUG | 301 | 7 | 69 | 6 | 23 | 3 | 194 | 4 | 588 | 5 | 5.0 |
| | AUG-SEP | 239 | 6 | 63 | 5 | 30 | 6 | 132 | 3 | 465 | 3 | 5.0 |
| 1971 | JUN-JUL | 163 | 4 | 40 | 2 | 45 | 8 | 131 | 2 | 380 | 2 | 4.0 |
| | AUG-SEP | 193 | 5 | 35 | 1 | 19 | 2 | 110 | 1 | 358 | 1 | 2.3 |

complaint rate of any two-month period since June 1969. This low rate may indicate a general reduction of reaction by the DPRS. It is also encouraging that the trial period was the first or second best period for each individual community with the exception of Rosedale. (The Rosedale area had a reduced number of overflights in 1969 because of runway construction, apparently causing fewer complaints.) The last column gives the mean rank of the four communities, indicating the average reaction of the individual communities for each period. The last two columns of data provide a reasonable basis for evaluation of community reaction in each period. The DPRS trial period had the best rating in each case.

As stated above, the trial period was shown to be the lowest complaint period since 1968, and even to be the lowest or next to lowest for three out of four communities. It is also true that the number of air carrier operations per month has shown a slight decline in the same time period, suggesting that perhaps the decrease in complaint resulted from reduced numbers of operations. (See Table 3.) This possibility was investigated. Table 4 shows complaints per thousand operations, which is the result of combining complaints from Table 2 with operations from Table 3. Although this is an extremely elementary measure of system performance, a procedure which yields fewer complaints per thousand aircraft operations is clearly preferable. Table 4 shows that the DPRS trial period resulted in a favorable complaint-to-operations ratio in terms of both the composite airport community and the four individual areas. The mean area rank and composite rank of the periods yield results as favorable to the DPRS period as those in Table 2.

Three other reasonable measures of performance were formulated to see if they yielded different results. These were as follows:

TABLE 3

THOUSANDS OF DEPARTURES AND ARRIVALS BY COMMUNITY AND MONTH

| YEAR | MONTH | COMMUNITY | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
| | | DEP | ARR | DEP | ARR | DEP | ARR | DEP | ARR |
| 1968 | June | 1.2 | 4.2 | 4.9 | 3.9 | 4.3 | 3.5 | 5.5 | 4.0 |
| | July | 0. | 3.7 | 5.6 | 4.5 | 4.1 | 2.2 | 6.5 | 6.2 |
| | August | 0.1 | 2.4 | 4.6 | 6.0 | 2.6 | 3.7 | 9.4 | 4.9 |
| | September | 0. | 1.2 | 6.7 | 4.5 | 1.4 | 3.5 | 7.6 | 6.6 |
| 1969 | June | 0.3 | 3.1 | 8.9 | 1.8 | 2.8 | 2.2 | 3.4 | 8.5 |
| | July | 1.3 | 3.0 | 7.0 | 3.7 | 2.1 | 3.8 | 6.3 | 7.3 |
| | August | 0. | 3.9 | 5.1 | 4.5 | 4.2 | 2.5 | 7.2 | 5.8 |
| | September | 1.2 | 1.1 | 5.8 | 3.5 | 1.6 | 4.8 | 6.9 | 6.3 |
| 1970 | June | 0.8 | 5.3 | 3.4 | 2.2 | 6.5 | 3.0 | 3.9 | 3.9 |
| | July | 0. | 5.0 | 4.8 | 2.9 | 6.6 | 1.7 | 4.0 | 5.9 |
| | August | 0.4 | 3.6 | 4.2 | 1.2 | 4.5 | 3.1 | 6.1 | 4.7 |
| | September | 0.4 | 2.9 | 4.1 | 3.8 | 3.8 | 2.9 | 5.9 | 4.6 |
| 1971 | June | 0.6 | 3.6 | 5.2 | 1.7 | 3.9 | 2.6 | 3.5 | 5.3 |
| | July | 0.2 | 3.5 | 4.8 | 3.3 | 4.1 | 2.6 | 5.6 | 5.2 |
| | August | 0.6 | 4.7 | 2.8 | 4.1 | 5.6 | 2.3 | 5.4 | 3.3 |
| | September | 1.4 | 3.8 | 4.7 | 1.6 | 4.3 | 2.8 | 2.9 | 5.0 |

TABLE 4

RATIO OF COMPLAINTS TO THOUSANDS OF OPERATIONS BY COMMUNITY AND MONTH

| YEAR | PERIOD | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | | COMPOSITE | | MEAN COMM RANK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RATIO | RANK | RATIO | RANK | RATIO | RANK | RATIO | RANK | RATIO | RANK | |
| 1969 | JUN-JUL | 28.83 | 1 | 8.97 | 6 | 3.39 | 4 | 30.16 | 8 | 18.63 | 5 | 4.8 |
| | JUL-AUG | 36.10 | 2 | 8.77 | 5 | 5.08 | 7 | 27.82 | 6 | 18.88 | 6 | 5.0 |
| | AUG-SEP | 43.71 | 5 | 5.19 | 1 | 3.89 | 5 | 27.94 | 7 | 17.89 | 4 | 4.5 |
| 1970 | JUN-JUL | 86.49 | 8 | 6.32 | 4 | 2.98 | 3 | 24.63 | 5 | 25.59 | 8 | 5.0 |
| | JUL-AUG | 66.89 | 7 | 10.61 | 8 | 2.96 | 2 | 18.79 | 4 | 20.05 | 7 | 5.3 |
| | AUG-SEP | 65.62 | 6 | 9.55 | 7 | 4.20 | 6 | 12.39 | 1 | 16.55 | 3 | 5.0 |
| 1971 | JUN-JUL | 41.27 | 4 | 5.40 | 3 | 6.89 | 8 | 13.42 | 3 | 13.66 | 2 | 4.5 |
| | AUG-SEP | 36.76 | 3 | 5.38 | 2 | 2.60 | 1 | 13.25 | 2 | 12.95 | 1 | 2.0 |

$$\text{Complaints}/10 \log_{10} (N_D + N_N)$$

$$\text{Complaints}/(N_D W_D + N_A W_A)$$

$$\text{Complaints}/10 \log_{10} (N_D W_D + N_A W_A),$$

where $N_D$ = Number of departures

$W_D$ = Community sensitivity to departures

$N_A$ = Number of arrivals

$W_A$ = Community sensitivity to arrivals

Use of each of the above measures to interpret the complaint data confirmed the results already presented. Thus the DPRS trial period, when considered in the context of complaints over a five-year period, was a period of significantly lower complaint activity.

The simplicity of Figure 3 obscures many details brought out in Tables 1 through 4. Nonetheless, these tables do not reveal the intricacy of complaint behavior. A number of factors are thought to affect complaint; indeed, many of the fluctuations in complaint indicated in Table 1 can probably be explained by examining some of the following variables:

Exposure - Month-to-month changes in exposure result from different numbers of arrivals and departures, day-night ratios, and numbers of operations which occur on weekends or holidays.

Population - Increased exposure to a large, densely populated area generates a larger increase in complaint than the same exposure increase over a small area would.

Weather - Wind conditions can have a monthly variation, which causes increased exposure to some areas with a corresponding decrease in other areas. Rain, fog, and other such conditions may have similar effects.

Temperature - Warmer days encourage people to spend more time out of doors and concurrently reduce aircraft altitudes on takeoff. This has a double effect upon effective exposure.

Social Interaction - Adverse publicity concerning aircraft noise can create a "snowballing" effect, resulting in more complaints, threats of organized action, and more adverse publicity.

Environmental Awareness - The public has taken the environmental quality issue seriously in recent years, resulting in increased complaints about any activity which seems to be "polluting" the environment.

Existing methodology does not permit prediction of complaint activity, but many of the probable factors have been identified. It is important to note that the DPRS model currently incorporates the first three factors listed above.

# RESULTS

## Survey Data

Because of the structure of the questionnaire, complaint potential and complaint action results are based on subsamples. Each respondent was asked what thing he disliked most in his neighborhood. If the respondent indicated aircraft noise, then he was asked if he felt like complaining about the noise and whether he actually did so. In 1969, 45 percent of the sample (484) indicated aircraft noise was the most disliked thing; in 1971, 59 percent (259) indicated this.

Complaint - Table 5 shows the complaint potential (desire to complain) of respondents in the New York samples by community and year. The data show that although a majority felt like complaining for both time periods, a general reduction occurred in the percentages from 1969 to 1971--especially in Five Towns, which had a 14 percent reduction. The Arverne area showed the least complaint potential in 1969; however, the data for this area for 1971 were inadequate for calculating meaningful percentages.

Table 6 shows that there was little overall difference in complaint action between 1969 and 1971. In both years half of the respondents who indicated that aircraft noise was the thing they most disliked in the neighborhood actually complained about it. However, each community had its own pattern. In both 1969 and 1971 a majority in Rosedale complained, and a minority did so in Five Towns. Arverne showed the least action in 1969 and Howard Beach reversed itself from 1969 to 1971--a majority indicated some action in 1969; a minority in 1971.

Annoyance and fear - Annoyance to aircraft noise was measured in terms of disturbance of everyday activities. The fear variable measures the respondent's anxiety about possible aircraft crashes and his perception of aircraft flying too low.

TABLE 5

COMPLAINT POTENTIAL OF NEW YORK SAMPLES* BY COMMUNITY AND YEAR, IN PERCENTAGES

| COMPLAINT POTENTIAL | TOTAL | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 |
| Any | 77 | 70 | 79 | 70 | 85 | 71 | 54 | - | 78 | 68 |
| None | 23 | 30 | 21 | 30 | 15 | 29 | 46 | - | 22 | 32 |
| (N) | (484) | (259) | (176) | (122) | (93) | (51) | (50) | (5) | (165) | (74) |

TABLE 6

COMPLAINT ACTION OF NEW YORK SAMPLES* BY COMMUNITY AND YEAR, IN PERCENTAGES

| COMPLAINT ACTION | TOTAL | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 |
| Any | 50 | 51 | 53 | 56 | 41 | 43 | 38 | - | 54 | 46 |
| None | 50 | 49 | 47 | 44 | 59 | 57 | 62 | - | 46 | 54 |
| (N) | (484) | (259) | (176) | (122) | (93) | (51) | (50) | (5) | (165) | (74) |

*Figures in Tables 5 and 6 are for subsamples: those respondents who said that aircraft noise was the most disliked thing about their neighborhood. The structure of the questionnaire did not permit obtaining the number of complainants for the entire sample.

Table 7 shows that high annoyance was somewhat higher in 1971 than in 1969. The associated rank order of the communities did not change over this period. Howard Beach was the most highly annoyed and was followed in order by Five Towns, Rosedale, and Arverne.

Although there was a slightly higher overall incidence of high fear in 1971, Table 8 shows that it increased in Rosedale and decreased by varying amounts in the other communities. Rankings changed over the time periods. Rankings in 1969 were, from highest to lowest: Howard Beach, Five Towns, Arverne, and Rosedale. In 1971 the rankings were: Five Towns, Howard Beach, and Rosedale (all essentially tied), and Arverne.

Adaptability - Respondents reported a definite lessened ability to tolerate any increase in noise. Table 9 shows that for every community the percentage willing to tolerate an increase was about halved from 1969 to 1971.

Misfeasance and importance - Attitudes concerning whether or not officials are derelict in their duty to do something about the noise problem changed somewhat. As shown in Table 10, high misfeasance scores increased in Rosedale and Five Towns and decreased in Arverne and Howard Beach over the period of concern.

In general, the respondents felt that the airport or air transportation was less important in 1971 than they did in 1969. Table 11 reveals that percentages for "highly important" evaluations decreased for every community, However, the shift was more toward the middle ranges of importance and the percentages for very low importance increased only slightly.

Noise susceptibility - Table 12 provides a check on changes in a basic attribute of the population. Noise susceptibility

TABLE 7

ANNOYANCE OF NEW YORK SAMPLES BY COMMUNITY AND YEAR, IN PERCENTAGES

| ANNOYANCE | TOTAL | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 |
| High | 63 | 71 | 57 | 66 | 69 | 76 | 54 | 44 | 76 | 78 |
| Med | 23 | 20 | 23 | 23 | 23 | 17 | 31 | 22 | 14 | 15 |
| Low | 14 | 10 | 20 | 11 | 8 | 7 | 15 | 33 | 9 | 7 |
| (N) | (1070) | (441) | (458) | (195) | (233) | (70) | (101) | (9) | (278) | (155) |



TABLE 8

FEAR OF NEW YORK SAMPLES BY COMMUNITY AND YEAR, IN PERCENTAGES

| FEAR | TOTAL | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 |
| High | 51 | 55 | 41 | 55 | 59 | 56 | 53 | 33 | 62 | 55 |
| Med | 26 | 25 | 28 | 25 | 21 | 30 | 24 | 11 | 25 | 24 |
| Low | 23 | 20 | 31 | 20 | 20 | 14 | 23 | 56 | 13 | 21 |
| (N) | (1070) | (441) | (458) | (195) | (233) | (70) | (101) | (9) | (278) | (155) |

TABLE 9

ADAPTABILITY OF NEW YORK SAMPLES BY COMMUNITY AND YEAR, IN PERCENTAGES

| ADAPTABILITY | TOTAL | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 |
| Any | 18 | 9 | 23 | 12 | 17 | 7 | 15 | 7 | 11 | 6 |
| None | 82 | 91 | 77 | 88 | 83 | 93 | 85 | 93 | 89 | 94 |
| (N) | (1070) | (441) | (458) | (195) | (233) | (70) | (101) | (9) | (278) | (155) |



TABLE 10

BELIEF IN MISFEASANCE OF NEW YORK SAMPLES BY COMMUNITY AND YEAR, IN PERCENTAGES

| MISFEASANCE | TOTAL | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 |
| High | 42 | 46 | 36 | 48 | 39 | 42 | 46 | 33 | 54 | 46 |
| Med | 34 | 35 | 32 | 32 | 36 | 44 | 46 | 44 | 30 | 34 |
| Low | 24 | 19 | 32 | 20 | 25 | 13 | 9 | 22 | 20 | 20 |
| (N) | (1070) | (441) | (458) | (195) | (233) | (70) | (101) | (9) | (278) | (155) |

TABLE 11

IMPORTANCE OF AIRPORT/AIR TRANSPORTATION REPORTED
BY NEW YORK SAMPLES BY COMMUNITY AND YEAR, IN PERCENTAGES

| IMPORTANCE | TOTAL | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 |
| High | 26 | 17 | 28 | 16 | 32 | 21 | 14 | 33 | 24 | 15 |
| Med | 68 | 75 | 65 | 77 | 64 | 70 | 79 | 55 | 72 | 76 |
| Low | 5 | 7 | 7 | 7 | 3 | 8 | 8 | 11 | 5 | 9 |
| (N) | (1070) | (441) | (458) | (195) | (233) | (70) | (101) | (9) | (278) | (155) |



TABLE 12

NOISE SUSCEPTIBILITY OF NEW YORK SAMPLES BY COMMUNITY AND YEAR, IN PERCENTAGES

| NOISE SUSCEPTIBILITY | TOTAL | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 | 1969 | 1971 |
| High | 10 | 7 | 8 | 5 | 14 | 6 | 5 | 0 | 12 | 10 |
| Med | 80 | 84 | 83 | 90 | 76 | 67 | 77 | 100 | 82 | 84 |
| Low | 10 | 9 | 9 | 6 | 11 | 27 | 18 | 0 | 6 | 6 |
| (N) | (1070) | (441) | (458) | (195) | (233) | (70) | (101) | (9) | (278) | (155) |

measures the disturbance by various sounds heard in the neighborhood. The more sounds heard and the greater the disturbance imputed to each, the greater the susceptibility. In Table 12 we find that the distributions of percentages were quite similar in 1969 and 1971, overall and by community. This is as it should be, as any wide variation in these distributions would suggest that the two samples are basically different with respect to noise perception and thus that other results may be suspect.

## Telephone Complaint Data

Tables 13 through 17 present the results of the analysis of FAA telephone complaint data. The following sections describe general trends in total complaints, repeat complaints, and complaints referring to noise, dwell, and low aircraft. Careful examination of these tables will reveal that the individual communities did not necessarily follow the overall trends. As an example of interpretation, these individual differences are examined below; this is done, however, only for total complaints.

Total complaints - Table 13 presents FAA complaints for 1969 and 1971 for the months of June through September for all communities combined (Column 1) and for each community separately (Columns 2-5). For each community, complaints are also given as percentages of total complaints for a given month.

Total complaints decreased from 1969 to 1971 (Column 1). In 1969 total complaints peaked in August. However, this pattern is not characteristic of each community. Rosedale peaked in August, Five Towns in July. Arverne showed a slight increase from June through September, while Howard Beach decreased during July and August. In 1969 the majority of complaints came from Howard Beach, followed next by Rosedale.

TABLE 13
FAA COMPLAINTS BY YEAR, MONTH, AND COMMUNITY

| YEAR | MONTH | TOTAL COMPLAINTS | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | % | N | % | N | % | N | % | N |
| 1969 | JUN | 482 | 23 | 113 | 13 | 62 | 2 | 8 | 62 | 299 |
| | JUL | 525 | 22 | 116 | 22 | 114 | 4 | 21 | 52 | 274 |
| | AUG | 540 | 28 | 153 | 13 | 71 | 5 | 29 | 53 | 287 |
| | SEP | 398 | 14 | 57 | 13 | 51 | 5 | 18 | 68 | 272 |
| | TOTAL | 1945 | | 439 | | 298 | | 76 | | 1132 |
| 1971 | JUN | 360 | 55 | 197 | 9 | 33 | 8 | 29 | 28 | 101 |
| | JUL | 285 | 34 | 97 | 14 | 39 | 15 | 42 | 38 | 107 |
| | AUG | 270 | 61 | 164 | 6 | 16 | 9 | 25 | 24 | 65 |
| | SEP | 328 | 48 | 156 | 13 | 44 | 3 | 11 | 36 | 117 |
| | TOTAL | 1243 | | 614 | | 132 | | 107 | | 390 |

In 1971 total complaints declined during July and August. Again, however, this pattern is not characteristic of each community, but results from the combination of the separate communities. In 1971 complaints in Five Towns and Howard Beach peaked in July and September; Arverne, in July. Rosedale peaked in June and August. In 1971 a near majority of complaints came from Rosedale, while Howard Beach was second. This is a reversal of the 1969 pattern.

In general, complaints decreased from 1969 to 1971. No other discernible pattern of complaint is evident; distributions of complaint are different for each year between communities and for each community between years. The source of most complaints changed from Howard Beach in 1969 to Rosedale in 1971.

Repeat complaints - Table 14 presents the data for repeat complaints as a function of total complaints. The percentages in Column 2 (total repeats) are based on the numbers in Column 1 (total complaints). Thus Column 2 shows what percentage of the total complaints for a particular year and month was from repeaters. The percentages in Columns 3 through 5 are based upon total complaints for each community. These totals are not shown in this table; however, they can be found in Columns 2 through 5 of Table 13. For example, in June 1969, 47 percent of the complaints in Rosedale were from repeaters (53/113 = 0.47).

In 1969 repeat complaints (Column 2) peaked in August, following the pattern of total complaints (Column 1). As with total complaints, the pattern of overall repeat complaints is a combination of unique community patterns. The percentage of repeats varied by month and community.

In 1971 repeat complaints decreased in August, again following the pattern of total complaints. Except for July, most of the

TABLE 14

REPEAT COMPLAINTS - PERCENTAGE OF TOTAL COMPLAINTS: BY YEAR, MONTH, AND COMMUNITY

| YEAR | MONTH | TOTAL COMPLAINTS | TOTAL REPEATS | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | % | N | % | N | % | N | % | N | % | N |
| 1969 | JUN | 482 | 49 | 238 | 47 | 53 | 57 | 35 | 13 | 1 | 50 | 149 |
| | JUL | 525 | 47 | 246 | 48 | 56 | 46 | 52 | 10 | 2 | 50 | 136 |
| | AUG | 540 | 53 | 285 | 60 | 91 | 58 | 41 | 55 | 16 | 48 | 137 |
| | SEP | 398 | 35 | 141 | 26 | 15 | 37 | 19 | 33 | 6 | 37 | 101 |
| 1971 | JUN | 360 | 41 | 148 | 50 | 98 | 33 | 11 | 38 | 11 | 28 | 28 |
| | JUL | 285 | 46 | 130 | 52 | 50 | 26 | 10 | 60 | 25 | 42 | 45 |
| | AUG | 270 | 38 | 102 | 47 | 77 | 0 | 0 | 28 | 7 | 28 | 18 |
| | SEP | 328 | 42 | 138 | 44 | 68 | 32 | 14 | 36 | 4 | 44 | 52 |

repeats in 1971 were in Rosedale (a tie with Howard Beach in September).

Almost 50 percent of the total complaints in 1969 were repeats, whereas in 1971 only 40 percent were repeats. No obvious simple pattern of change was evident with respect to the distribution of complaints by community or by year. In this respect, repeat complaints were similar to total complaints.

Complaints about "noise"* - Table 15 shows complaints citing "noise" as a function of total complaints. Bases for percentages are the same as those described for Table 14.

In 1969 the percentage reporting noise as the reason for complaining remained constant at about 46 percent (Column 2) from June through September. There was a slight peak in August. The patterns for each community (Columns 3-6) differed only slightly from the overall pattern.

The percentages for 1971 were all lower than for 1969. On an overall basis, they fluctuated somewhat, but the trend was for a decrease from June through September (Column 1). This trend was generally followed in each of the communities (except for Arverne). The statistical problem of a small total number existed in 1969 and 1971 for Arverne.

In general, the same pattern of complaint about noise existed for all communities in both 1969 and 1971, although this pattern was different in each year. In 1969 it was constant from month

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*Since a caller could mention any number of things when he called, multiple content coding was used for these data. This means that the various reasons cited for calling (noise, low overflight, and dwell) will not add up to 100 percent.

TABLE 15

COMPLAINTS CITING NOISE - PERCENTAGE OF TOTAL COMPLAINTS: BY YEAR, MONTH, AND COMMUNITY

| YEAR | MONTH | TOTAL COMPLAINTS | TOTAL CITING NOISE | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | % | N | % | N | % | N | % | N | % | N |
| 1969 | JUN | 482 | 44 | 210 | 43 | 49 | 47 | 29 | 50 | 4 | 43 | 128 |
| | JUL | 525 | 45 | 234 | 45 | 52 | 47 | 53 | 38 | 8 | 44 | 121 |
| | AUG | 540 | 48 | 259 | 46 | 70 | 49 | 35 | 55 | 16 | 48 | 138 |
| | SEP | 398 | 46 | 184 | 40 | 23 | 59 | 30 | 56 | 10 | 45 | 121 |
| 1971 | JUN | 360 | 32 | 115 | 34 | 66 | 42 | 14 | 31 | 9 | 26 | 26 |
| | JUL | 285 | 24 | 68 | 23 | 22 | 23 | 9 | 24 | 10 | 25 | 27 |
| | AUG | 270 | 27 | 74 | 29 | 47 | 31 | 5 | 28 | 7 | 23 | 15 |
| | SEP | 328 | 23 | 76 | 22 | 35 | 32 | 14 | 55 | 6 | 18 | 21 |

to month and in 1971 it was declining. Excluding Arverne, no one community had proportionately more complaints than any other. There was about a 20 percent drop in the proportion of complaints about "noise" between 1969 and 1971.

Complaints about "low aircraft" - In Table 16 data on complaint citing low overflight are presented. Bases for percentages remain the same as for Table 14.

In 1969 the monthly pattern was a general increase in complaints of this type (Column 2). In 1971 the monthly pattern was reasonably constant except for a peak in July. No one community appeared to be especially prone to this particular type of complaint.

There was very little overall difference in the percentage of complaint about low flyover between 1969 and 1971, although the amount of such complaint was less in 1971. The general trend of an increase in each community during 1969 changed to a variety of patterns among the communities during 1971.

Complaints about "dwell" - Complaints citing dwell, or persistence of flyover noise, as a problem are presented in Table 17. Bases for percentages remain the same as for Table 14.

In 1969 the percentage of complaints citing dwell as the reason for complaining increased slightly from June through September (Column 2). In 1971 the overall percentages were fairly constant for June through August, with a slight increase in September. The patterns were somewhat similar in each community.

In general, there was an increase in both the percentage and number of complaints about dwell from 1969 to 1971. It is not known for certain to what this increase may be properly attributed. The DPRS tends to reduce actual dwell and it is believed that

TABLE 16

COMPLAINTS CITING LOW OVERFLIGHT - PERCENTAGE OF TOTAL COMPLAINT: BY YEAR, MONTH, AND COMMUNITY

| YEAR | MONTH | TOTAL COMPLAINTS | TOTAL CITING LOW OVERFLIGHT | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | % | N | % | N | % | N | % | N | % | N |
| 1969 | JUN | 482 | 16 | 78 | 17 | 19 | 8 | 5 | 25 | 2 | 17 | 52 |
| | JUL | 525 | 26 | 137 | 19 | 22 | 21 | 24 | 5 | 1 | 33 | 90 |
| | AUG | 540 | 32 | 173 | 30 | 46 | 41 | 29 | 38 | 11 | 30 | 87 |
| | SEP | 398 | 43 | 172 | 40 | 23 | 31 | 16 | 28 | 5 | 47 | 128 |
| 1971 | JUN | 360 | 29 | 105 | 18 | 36 | 58 | 19 | 48 | 14 | 36 | 36 |
| | JUL | 285 | 36 | 104 | 24 | 23 | 36 | 14 | 41 | 17 | 47 | 50 |
| | AUG | 270 | 28 | 76 | 24 | 39 | 13 | 2 | 16 | 4 | 48 | 31 |
| | SEP | 328 | 30 | 97 | 25 | 39 | 34 | 15 | 9 | 1 | 36 | 42 |

TABLE 17

COMPLAINTS CITING DWELL - PERCENTAGE OF TOTAL COMPLAINTS: BY YEAR, MONTH, AND COMMUNITY

| YEAR | MONTH | TOTAL COMPLAINTS | TOTAL CITING DWELL | | ROSEDALE | | FIVE TOWNS | | ARVERNE | | HOWARD BEACH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | % | N | % | N | % | N | % | N | % | N |
| 1969 | JUN | 482 | 9 | 44 | 10 | 11 | 10 | 6 | 0 | 0 | 9 | 27 |
| | JUL | 525 | 13 | 67 | 12 | 14 | 14 | 16 | 5 | 1 | 13 | 36 |
| | AUG | 540 | 12 | 64 | 14 | 22 | 16 | 11 | 10 | 3 | 10 | 28 |
| | SEP | 398 | 15 | 58 | 7 | 4 | 20 | 10 | 11 | 2 | 15 | 42 |
| 1971 | JUN | 360 | 29 | 105 | 32 | 62 | 49 | 16 | 10 | 3 | 24 | 24 |
| | JUL | 285 | 30 | 85 | 30 | 29 | 31 | 12 | 24 | 10 | 32 | 34 |
| | AUG | 270 | 25 | 68 | 29 | 47 | 19 | 3 | 16 | 4 | 22 | 14 |
| | SEP | 328 | 36 | 117 | 31 | 48 | 46 | 20 | 18 | 2 | 40 | 47 |

further analysis for the FAA will confirm that a reduction in dwell did take place between 1969 and 1971. On the other hand, there was in this period a certain amount of public information released dealing specifically with the dwell factor; this may have biased the complaint reactions in that direction.

## Summary of Results

On the basis of the foregoing data, a comparison of the results for the summer of 1969 and the summer of 1971 may be summarized as follows:

1) The incidence of high annoyance due to aircraft noise disturbance was 63 percent in 1969 and 71 percent in 1971.

2) The proportion of respondents who asserted that aircraft noise was the thing they disliked most about their neighborhoods was 45 percent and 59 percent, respectively, in 1969 and 1971.

3) Of those who made the assertion in 2) above, the proportions who actually complained about the noise were 50 percent and 51 percent in 1969 and 1971, respectively; the proportions of those who indicated a desire to complain were 77 percent and 70 percent.

4) High fear of aircraft crashing was 51 percent in 1969 and 55 percent in 1971.

5) The proportions of respondents willing to tolerate an increase in aircraft noise were 18 percent and 9 percent, respectively, in 1969 and 1971.

6) Affective ties with the airport or air transportation were loosened somewhat in 1971. Belief in misfeasance on the part of responsible authorities was increased somewhat, especially in Rosedale.

7) The perception of various neighborhood noise sources was essentially the same in 1969 and 1971.

8) The individual communities around the airport did not necessarily follow the overall pattern with respect to the preceding variables.

9) The total number of telephone complaints received by the FAA Noise Abatement Office decreased from 1,945 to 1,243 (for the months of June through September).

10) The proportion of complaints in 9) above registered by repeat complainants was 50 percent in 1969 and 40 percent in 1971.

11) The content of the complaints changed as follows:

    a) Those mentioning "noise" per se decreased from 46 percent to 26 percent.

    b) Those citing "low overflight" remained constant at about 40 percent.

    c) Those mentioning "dwell" or persistence of overflights increased from 12 percent to 30 percent.

# CONCLUSIONS

1) The incidences of high annoyance due to aircraft noise and of high fear of aircraft crashing were slightly higher during the 1971 DPRS trial period than in the 1969 survey.

2) The number of telephone complaints regarding aircraft noise aspects was substantially lower during the DPRS trial period in 1971 than in the summers of 1969 and 1970.

3) Various attitudes regarding the airport, air transportation, associated officials and agencies, and aircraft noise itself were somewhat less favorable in 1971 than in 1969.

4) The two-month trial period of the DPRS during the summer "complaint season" was too short to avoid biasing effects of wind statistics and to be certain that changes in community reaction were reflected in the results of the social survey.

5) As a consequence of uncontrolled variables, the results above do not afford a definite appraisal of the efficacy of the DPRS, either positive or negative. However, with all recognized influencing factors considered, the indications are more favorable than otherwise.

6) In view of the preceding, continued use and eventual further development of the DPRS is warranted. In addition, continuing further evaluation of the DPRS and its elements and behavior is needed.

## REFERENCES

1) Edmiston, R. D. and Connor, W. K. "Installation and Operation of a Dynamic Preferential Runway System, John F. Kennedy International Airport, Jamaica, New York." TRACOR Project 076-158, Document Number T-71-AU-9306-6, FAA Contract Number DOT-FA71EA-6355, 7 December 1971 (in preparation).

2) Gach, Martin. "Appraisal of Community Response to Aircraft Noise--At the Grass Roots Level." In Proceedings, Conference on Aircraft and the Environment, Part I, Society of Automotive Engineers, Inc., 1971.

3) TRACOR, Inc., "Community Reaction to Airport Noise." Final Report, Volume I, CR-1761, National Aeronautics and Space Administration, September 1970.

# APPENDIX A

## CONSTRUCTION OF SURVEY VARIABLES

# APPENDIX A

## Construction of Survey Variables

The variables in this appendix are derived from items in the questionnaire of Appendix B. For each variable five sorts of information are provided: 1) variable name - the label which is used in the analysis; 2) range of the variable - the maximum and minimum values the variable can assume; 3) categories - classes into which the values of the variable are grouped; 4) questionnaire items - the number(s) of the question(s) which compose the variable and the page number(s); and 5) construction details - information which is pertinent to the development of the variable.

1. Variable: Adaptability
2. Range: 0-1
3. Categories: none
4. Questionnaire items:
   19a (P. 69)
   If this area were to receive more noise from aircraft, how much of this noise do you think you could learn to live with? TWICE AS MUCH __, THREE TIMES AS MUCH __, FOUR TIMES AS MUCH __, NO MORE AT ALL __, UNDECIDED __, NR __.
5. Construction:
   If the respondent indicated NO MORE AT ALL, UNDECIDED, or NR, he was given the score of zero. If the respondent indicated TWICE AS MUCH or more, the score of one was given.

1. Variable: Annoyance-G
2. Range: 0-45
3. Categories: 0-9, 10-21, 22-45
4. Questionnaire items:
   20a (P. 70)
   I will now read a number of daily activities. Which of these are disturbed by aircraft noise in your own situation here?
   (READ LIST BELOW AND CHECK "YES," "NO," "DK," OR "NR.")
   20b (P. 70)
   (OF THOSE THAT ARE DISTURBED): How much are you bothered? Use Opinion Thermometer.
5. Construction:
   Annoyance-G is a summated-rating index composed of nine everyday activities: relaxing/resting inside, relaxing/resting outside, sleep, conversation, telephone conversation, listening to records/tapes, radio/TV interference, reading or concentration, and eating. From the list of items on Page 70, an average of the items "children sleeping/napping," "going to sleep," and "late sleep" was used for the item "sleep." An average of "listening to radio/TV" and "watching TV' was used for the item "radio/TV interference." In order to form the total index, each 0 to 4 scale was converted to a 1 to 5, "DK" and "NR" were coded zero, and all scores were summed.

1. Variable: Complaint Action
2. Range: 0-1
3. Categories: none
4. Questionnaire items:
   5E (P. 63)
   Did you (or your family) actually do any of these things? Discussed it with someone? Telephoned or wrote to an official? Signed a petition? Visited an official? Attended a meeting about it? Helped to set up a committee to do something about it? Wrote a letter to the editor? Filed a suit? Other?
5. Construction:
   Since the incidence of anyone actually doing anything was low, a response of "yes" to any of the above items was considered action and the respondent was given a code of one for any complaint action; otherwise he was given the code zero, none.

1. Variable: Complaint Potential
2. Range: 0-1
3. Categories: none
4. Questionnaire items:
   5D (P. 62)
   Do/did you yourself ever feel like doing something to improve this situation? For example, do/did you feel like:
   Discussing it with someone?
   Telephoning or writing to an official?
   Signing a petition?
   Visiting an official?
   Attending a meeting about it?
   Helping to set up a committee to do something about it?
   Writing a letter to the editor?
   Filing a suit?
   Other?
5. Construction:
   Since the incidence of anyone feeling like doing anything was slight, a response of "yes" to any one of the above items was considered potential action and the respondent was given a code of one, "any," otherwise he was given the code of zero, "none."

1. Variable: Fear
2. Range: 0-10
3. Categories: 0-3, 4-6, 7-10
4. Questionnaire items:

   10 (P. 67)

   When you seen or hear airplanes overhead, how often do you feel they are flying too low for the safety of residents in the area? Use Opinion Thermometer.

   0 1 2 3 4 DK NR

   11 (P. 67)

   When you see or hear airplanes overhead, how often do you feel there is some danger that they might crash nearby? Use Opinion Thermometer.

   0 1 2 3 4 DK NR
5. Construction:

   "Fear" is formed by converting 0 to 4 scales to 1 to 5, coding "DK" and "NR" zero, and summing for both items.

1. Variable: Importance
2. Range: 0-5
3. Categories: none
4. Questionnaire items:

   42 (P. 73)
   This city can be proud of the services its airport provides to both the community and to its clients.
   TRUE ___ FALSE ___

   43 (P. 73)
   The advantages to the community from having a large airport far outweigh any disadvantages.
   TRUE ___ FALSE ___

   45 (P. 73)
   Airport authorities try to avoid sending many flights over heavily populated areas.
   TRUE ___ FALSE ___

   48 (P. 73)
   The defense of our country is not possible without military aircraft.
   TRUE ___ FALSE ___

   55 (P. 74)
   Air transportation is the only practical way of long-distance travel.
   TRUE ___ FALSE ___

5. Construction

   For each item TRUE is coded zero and FALSE is coded one. The sum of the five items constitutes the Importance index. This index measures the affective attractiveness of the airport or the airline industry to the respondent. A high score indicates a lack of importance to the respondent.

1. Variable: Misfeasance
2. Range: 0-4
3. Categories: none
4. Questionnaire items:

   36 (P. 72)

   Aircraft designers are doing all they can to produce quieter engines.

   TRUE ___ FALSE ___ DK ___ NR ___

   37 (P. 73)

   The airport is operated in such a way as to serve the best interests of the entire city.

   TRUE ___ FALSE ___ DK ___ NR ___

   39 (P. 73)

   Community leaders are doing all they can possible to reduce aircraft noise in this city.

   TRUE ___ FALSE ___ DK ___ NR ___

   40 (P. 73)

   Airport authorities are doing all they can possible to reduce aircraft noise.

   TRUE ___ FALSE ___ DK ___ NR ___

5. Construction:

   For each item TRUE is coded zero and FALSE is coded one. The sum of the four items constitutes the Misfeasance index. This index measurss the respondent's belief that those officials and authorities who are in a position to do something about the noise problem simply are not doing their job. Misfeasance is used rather than malfeasance since there is no intent to break the law or to do something illegal.

1. Variable: Noise Susceptibility
2. Range: 0-65
3. Categories: 0-9, 10-29, 30-65
4. Questionnaire items:
   9a (P. 65)
   I will now read a number of noises heard in different neighborhoods. Which ones do you hear in this neighborhood? (READ LIST TO RESPONDENT, CHECKING WHETHER NOISE IS HEARD OR NOT.)
   9b (P. 65)
   Of those that you hear, how much are you bothered or annoyed? Use Opinion Thermometer.
5. Construction:
   The thirteen noise sources are autos, neighborhood children, aircraft, dogs/pets, people, motorcycles/hotrods, trains, sirens, construction, lawn mowers, garbage collection, sonic booms, and trucks. Each 0 to 4 scale was converted to a 1 to 5; "DK" and "NR" were coded zero, and all items summed.

# APPENDIX B

## QUESTIONNAIRE FORM D(R)
## (TRUNCATED)

OFFICE USE ONLY

No. _____

Rcd. _____ /

Log _____

Validity P/R /

Grade _____

# PROGRAM IN COMMUNITY STUDIES 1970 FORM D (R)

(TRUNCATED)

FORM APPROVED

BUDGET BUREAU NO. 104-S70002

QUESTIONNAIRE (FORM D--REVISED)

Interviewer Name _____ Number _____

City _____

Date of Interview _____ / _____ / _____
Month Day Year

Time Interview Began _____ Ended _____ Total Minutes _____

Census Tract _____ _____ Census Block _____

---

(NOTE TO INTERVIEWER: YOUR INSTRUCTIONS ARE IN CAPITAL LETTERS AND ENCLOSED IN PARENTHESES. DO NOT READ THESE INSTRUCTIONS TO RESPONDENT.)

(1). (INTRODUCE SELF)

(2). (INDICATE SUBJECT AND PURPOSE OF STUDY, FOR EXAMPLE:)

I am a research interviewer working on a study of community issues here in (NAME OF CITY). My job is to help conduct a survey of the attitudes and opinions of the residents of this city and this neighborhood regarding common issues. Any answers you give me will be confidential, and they will be used to help plan future community improvements.

(3) (HAND RESPONDENT OPINION THERMOMETER.)

The two sides of this card have "opinion thermometers" which we will use in several questions to estimate how you feel about certain things. For example, turn to Side I. On the left is a Frequency Scale to estimate How Often. For practice, let's estimate how often you go to the movies. Think of how often you go. If you rarely go to the movies, you

would say "zero". On the other hand, if you went very often, you would say "four" or perhaps "three". If you sometimes go to the movies, you would say "one" or "two". If you go to the movies about as often as your friends or acquaintances you would have a score of "two" - the average in most cases.

Now, how often would you say you go to the movies? (CIRCLE NUMBER) 0 1 2 3 4

The other scales (How Much and How Good) are used in the same way. Remember that "three" or "four" mean Very Much or Very Good, "zero" means Very Poor or Not at All, and "two" means About Average.

Now we will start.

(1) How long have you lived in (NEIGHBORHOOD)? _____
(RECORD IN YEARS)
DK _____ NR _____

(2) How long have you lived in (CITY)? _____
(RECORD IN YEARS)
DK _____ NR _____

Now, at the present time, what are some of the things you like or don't like about living in this neighborhood - things that you feel are advantages and make this a good place to live, or disadvantages - things that you feel are unpleasant?

(3) What are the advantages, if any?

(RECORD ANSWER VERBATIM IN SPACE BELOW)

Only 1st mentioned advantage

Now, most neighborhoods have some things about them people dislike.

(4a) What are the disadvantages of living in this neighborhood, if any?

(RECORD ANSWER VERBATIM, RETAINING ORDER OF MENTION)

(NUMBER ORDER OF MENTION IN COLUMN 4A)

(IF VERBATIM ANSWERS DO NOT "FIT" CATEGORIES, RECORD ANSWERS IN SPACES BELOW "AIRCRAFT NOISE")

Only 1st mentioned disadvantage

DISADVANTAGES

1. _____

X. _____

X. _____

X. _____

DK_____ NR_____

Here is a list of things some people dislike the most about where they live.

(INTRODUCE CARD 1, HAND TO RESPONDENT)

(4b) Which one thing on this list (ADD ANY MENTIONED IN 4a) do you dislike the most about where you live?

(MARK ONE THING DISLIKED THE MOST IN COLUMN 4B)

| 4A | | 4B | 4C | DK | NR |
|---|---|---|---|---|---|
| | NOTHING DISLIKED | | | | |
| | INCONVENIENT LOCATION | | 0 1 2 3 4 | | |
| | EXPENSIVE PLACE TO LIVE | | 0 1 2 3 4 | | |
| | UNSAFE PLACE TO LIVE | | 0 1 2 3 4 | | |
| | RUN-DOWN NEIGHBORHOOD | | 0 1 2 3 4 | | |
| | POOR FACILITIES | | 0 1 2 3 4 | | |
| | UNFRIENDLY NEIGHBORS | | 0 1 2 3 4 | | |
| | DISLIKE FOR A CERTAIN HOUSE | | 0 1 2 3 4 | | |
| | NO PRIVACY | | 0 1 2 3 4 | | |
| | OTHER NOISE | | 0 1 2 3 4 | | |
| | AIRCRAFT NOISE | | 0 1 2 3 4 | | |
| | | | 0 1 2 3 4 | | |
| | | | 0 1 2 3 4 | | |
| | | | 0 1 2 3 4 | | |
| | | | 0 1 2 3 4 | | |

(TAKE BACK CARD 1)

(4c). Using the Opinion Thermometer, how much do you dislike this one thing? (CIRCLE NUMBER IN COLUMN 4C)

(GO TO ~~4D~~) 5C

→ (SKIP TO ~~5A~~) 9A

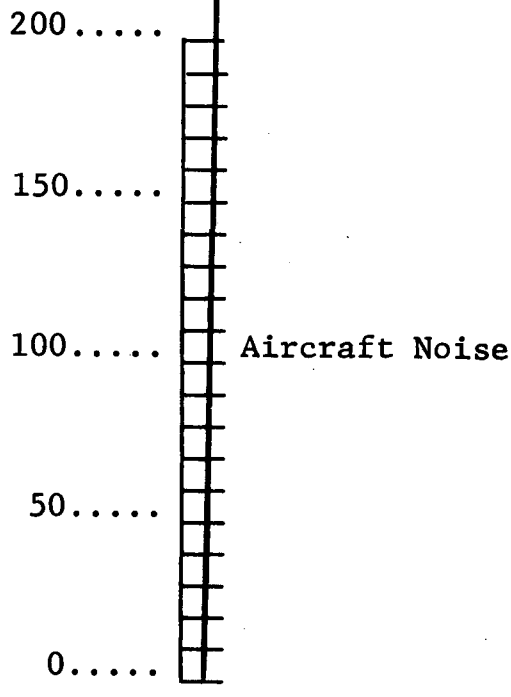
~~4A~~. In order to find out how important (Most Disliked Thing) is in comparison to other things in the neighborhood, we want you to locate several items on a scale. (HAND R. CARD 2.) The idea is to pick a number on the scale which shows the relative importance of (Most Disliked Thing) to you.

(IF AIRCRAFT NOISE IS MOST DISLIKED THING):
Notice that Aircraft Noise is located at the number "100." What number below it do you feel best fits the next most disliked thing in your neighborhood?
(WRITE IN LOCATION OF NEXT MOST DISLIKED THING) (TAKE BACK CARD 2)
(GO TO 5C)

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

(IF AIRCRAFT NOISE IS NOT MOST DISLIKED THING):
For example, Aircraft Noise is located at the number "100." What number above it do you feel best fits (Most Disliked Thing) in comparison to Aircraft Noise?
(WRITE IN LOCATION OF MOST DISLIKED THING) (TAKE BACK CARD 2)
(GO TO 5C)

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -



~~(IF NOTHING DISLIKED, ASK:)~~

~~5b~~. In the past was there ever anything you disliked about living here?

YES _____; NO _____ (IF NO, DK OR NR GO TO QUESTION 8)
DK _____; NR _____

~~5c~~. (IF YES): What was that? _____

_____

5c How many times in an average week do/did you discuss (MOST DISLIKED THING OR ONE THING DISLIKED IN THE PAST) with friends, neighbors, or relatives?

(CIRCLE NUMBER) 0 1 2 3 4 More than 4 DK___NR___

5d Do/did you yourself ever feel like doing something to improve this situation? For example, do/did you feel like: (READ LIST, MARK "YES" OR "NO")

| | 5D | | | | 5E | | | |
|---|---|---|---|---|---|---|---|---|
| | YES | NO | DK | NR | YES | NO | DK | NR |
| DISCUSSING IT WITH SOMEONE | | | | | | | | |
| TELEPHONING OR WRITING TO AN OFFICIAL | | | | | | | | |
| SIGNING A PETITION | | | | | | | | |
| VISITING AN OFFICIAL | | | | | | | | |
| ATTENDING A MEETING ABOUT IT | | | | | | | | |
| HELPING TO SET UP A COMMITTEE TO DO SOMETHING ABOUT IT | | | | | | | | |
| WRITING A LETTER TO THE EDITOR | | | | | | | | |
| FILING A SUIT | | | | | | | | |
| OTHER | | | | | | | | |

(IF RESPONDENT ANSWERS "NO" TO ALL ITEMS IN 5D, GO TO 5F)

5e. Did you (or your family) actually do any of these things?

YES _____; NO _____ DK _____ NR _____

(IF YES): Which one(s)? (MARK IN COLUMN 5E)

What happened? _____

_____

_____

(IF NO): Why is that? That is, why did you decide not to do anything?

_____

_____

5f. Has any local organization ever asked you to do any of these things?

YES _____; NO _____; DK _____; NR _____

5g. What do you think are/were the chances of an organization improving or reducing this situation?

VERY GOOD ___; GOOD ___; FAIR ___; NOT VERY GOOD ___;

POOR ___; DK ___; NR ___

5h. Do/did you happen to know who or where to call if you wanted to complain?

YES _____; NO _____; DK _____; NR _____

X. In your own opinion, how much are/were your neighbors bothered by this situation? Use the Opinion Thermometer.

(CIRCLE NUMBER) 0 1 2 3 4 DK____ NR____.

(ASK EVERYONE):

X. Here is a list of sounds which sometimes bother people. Most people hear these sounds somewhere, not necessarily in their own homes. Use the Opinion Thermometer to rate how much each sound bothers you when you do hear it.

(READ LIST AND CIRCLE NUMBER FOR EACH SOUND)

| SOUNDS | RATING | DK | NR |
|---|---|---|---|
| WALKING ON GRITTY FLOORS | 0 1 2 3 4 | | |
| MUSICAL INSTRUMENTS IN PRACTICE | 0 1 2 3 4 | | |
| BANGING DOORS | 0 1 2 3 4 | | |
| AIR HAMMERS | 0 1 2 3 4 | | |
| DRIPPING WATER | 0 1 2 3 4 | | |
| WHISTLING | 0 1 2 3 4 | | |
| CHALK SCRAPING ON A BLACKBOARD | 0 1 2 3 4 | | |
| NEIGHBOR'S RINGING TELEPHONE | 0 1 2 3 4 | | |
| PEOPLE WALKING ON THE FLOOR ABOVE | 0 1 2 3 4 | | |
| CHAIRS SCRAPING ON THE FLOOR | 0 1 2 3 4 | | |
| NEIGHBORS LAUGHING OR QUARRELING | 0 1 2 3 4 | | |
| TYPEWRITERS | 0 1 2 3 4 | | |

9a. I will now read a number of noises heard in different neighborhoods. Which ones do you hear in this neighborhood ?

(READ LIST TO RESPONDENT, CHECKING WHETHER NOISE IS HEARD OR NOT)

(FINISH 9a BEFORE ASKING 9b)

9b. Of those that you hear, how much are you bothered or annoyed? Use the Opinion Thermometer.

(CIRCLE NUMBER IN COLUMN 9b ONLY FOR THOSE NOISES HEARD)

(FINISH 9b BEFORE ASKING 9c)

~~9c~~. Some people are more aware of noise than others. How much is each noise that you hear noticeable to you; that is, how much attention do you pay to each one? Please use the Opinion Thermometer.

(CIRCLE NUMBER IN COLUMN 9c )

(PROBE TO SEE IF RESPONDENT WOULD NOW LIKE TO INCLUDE MORE NOISES AS HEARD)

| | 9a HEARD | | | | 9b ANNOYS | | | NOTICES | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | DK | NR | | DK | NR | | DK | NR |
| AUTOS | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| NEBH. CHILDREN | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| AIRCRAFT | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| DOGS/PETS | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| PEOPLE | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| CYCLES/HOT RODS | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| TRAINS | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| SIRENS | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| CONSTRUCTION | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| LAWN MOWERS | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| GARBAGE COLLECTION | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| SONIC BOOMS | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| TRUCKS | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| OTHER (SPECIFY) | YES | NO | | | 0 1 2 3 4 | | | 0 1 2 3 4 | | |
| NO NOISES HEARD | YES | | | | | | | | | |

→(SKIP TO QUESTION 20a)

(10) When you see or hear airplanes overhead, how often do you feel they are flying too low for the safety of residents in the area? Use Opinion Thermometer.

(CIRCLE NUMBER) 0 1 2 3 4 DK_____; NR_____

(11) When you see or hear airplanes overhead how often do you feel there is some danger that they might crash nearby? Use Opinion Thermometer.

(CIRCLE NUMBER) 0 1 2 3 4 DK_____; NR_____

~~12.~~ What times of the day do you particularly notice aircraft noise? (CHECK WHETHER WEEKDAYS OR WEEKENDS)

| | Morning | | Afternoon | | Evening | | Night | |
|---|---|---|---|---|---|---|---|---|
| | 6-9 | 9-12 | 12-3 | 3-6 | 6-9 | 9-12 | 12-3 | 3-6 |
| WEEK-DAYS | | | | | | | | |
| WEEK-ENDS | | | | | | | | |
| DK | | | | | | | | |
| NR | | | | | | | | |

All the time _____

No particular time _____

~~13~~. What days of the week do you particularly notice aircraft noise?

| | Sun. | Mon. | Tues. | Wed. | Thur. | Fri. | Sat. |
|---|---|---|---|---|---|---|---|
| YES | | | | | | | |
| NO | | | | | | | |
| DK | | | | | | | |
| NR | | | | | | | |

Every day _____

No particular day _____

(14.) How often do you notice smoke, fumes, oil dropout, or landing lights from overflying airplanes? Use the Opinion Thermometer. (MARK IN COLUMN 14 BELOW)

| | 14 | 15 |
|---|---|---|
| SMOKE | 0 1 2 3 4 DK NR | 0 1 2 3 4 DK NR |
| FUMES | 0 1 2 3 4 DK NR | 0 1 2 3 4 DK NR |
| OIL DROPOUT | 0 1 2 3 4 DK NR | 0 1 2 3 4 DK NR |
| LANDING LIGHTS | 0 1 2 3 4 DK NR | 0 1 2 3 4 DK NR |

IF "NONE," (ZERO ON ALL ITEMS) FOR QUESTION 14

(15.) How much does (EACH ITEM IN QUESTION 14 THAT IS NOTICED) annoy you? Use the Opinion Thermometer. (MARK IN COLUMN 15 ABOVE)

~~16~~. Were you fully aware of the noise from aircraft operations in this neighborhood before coming here?

YES _____; NO _____; DK _____; NR_____

~~17~~. How much would you say aircraft operations have increased in this area in the past five years? Use the Opinion Thermometer.

(CIRCLE NUMBER) 0 1 2 3 4 DK_____; NR_____

(18). Would you say that you have learned to live with aircraft noise the way it is now?

YES_____; NO_____; UNDECIDED_____; NR_____

(19a). If this area were to receive more noise from aircraft, how much of this noise do you think you could learn to live with?

TWICE AS MUCH_____; THREE TIMES AS MUCH_____;

FOUR TIMES AS MUCH_____; NO MORE AT ALL_____; UNDECIDED_____

NR_____

~~19b~~. Which could you learn to live with, aircraft noise which occurs frequently but not very loud, or aircraft noise which occurs infrequently but loud?

FREQUENTLY BUT NOT VERY LOUD_____

INFREQUENTLY BUT LOUD_____

UNDECIDED_____

NR_____

20a I will now read a number of daily activities. Which of these are disturbed by aircraft noise in your own situation here? (READ LIST BELOW AND CHECK "YES," "NO," "DK," OR "NR")

| | 20a DISTURBED | | | | 20b BOTHERED | | |
|---|---|---|---|---|---|---|---|
| | | | DK | NR | | DK | NR |
| RELAXING/RESTING INSIDE | Yes | No | | | 0 1 2 3 4 | | |
| RELAXING OUTSIDE | Yes | No | | | 0 1 2 3 4 | | |
| CHILDREN SLEEPING/NAPPING | Yes | No | | | 0 1 2 3 4 | | |
| CONVERSATION | Yes | No | | | 0 1 2 3 4 | | |
| TELEPHONE CONVERSATION | Yes | No | | | 0 1 2 3 4 | | |
| GOING TO SLEEP | Yes | No | | | 0 1 2 3 4 | | |
| LISTENING TO RECORDS/TAPES | Yes | No | | | 0 1 2 3 4 | | |
| LISTENING TO RADIO/TV | Yes | No | | | 0 1 2 3 4 | | |
| WATCHING TV | Yes | No | | | 0 1 2 3 4 | | |
| LATE SLEEP | Yes | No | | | 0 1 2 3 4 | | |
| READING OR CONCENTRATION | Yes | No | | | 0 1 2 3 4 | | |
| EATING | Yes | No | | | 0 1 2 3 4 | | |
| OTHER | Yes | No | | | 0 1 2 3 4 | | |
| NONE | Yes | | | | | | |

20b (OF THOSE THAT ARE DISTURBED): How much are you bothered? Use the Opinion Thermometer. (CIRCLE NUMBER IN COLUMN 20b)

~~21~~. How often do airplanes make the house (building) vibrate or make the windows rattle? Use the Opinion Thermometer.

(CIRCLE NUMBER) 0 1 2 3 4 DK_____ NR_____

~~22~~. Who would you say controls the flight operations of aircraft around here?

_____

DK_____NR_____

~~23a~~. Would you say the value of land in this area has gone up, gone down, or not changed in the past five years?

NOT CHANGED _____ DK _____
GONE DOWN _____ NR _____
GONE UP _____

23b. (IF CHANGED): Has the airport or aircraft operations been responsible for this change in any way?

YES_____; NO_____

~~24a~~. (IF LAND VALUE HAS GONE DOWN IN QUESTION 23a): If a person felt that aircraft operations were reducing the value of his property, do you think he would be able to recover damages through an appeal to the proper authorities?

YES_____; NO_____; DK_____; NR_____

~~24b~~. (IF NO): Why not?_____

_____

_____

~~25~~. Do you know of anyone who has moved out of this area because of aircraft noise?

YES_____; NO_____; DK_____; NR_____

(IF YES): How many?_____

| | | YES | NO | DK | NR |
|---|---|---|---|---|---|
| ~~26.~~ | Do you think that jet engines could safely be made quieter with mufflers or other devices like that? | — | — | — | — |
| ~~27.~~ | Is it necessary for jet planes to sit on the ends of runways and roar their engines? | — | — | — | — |
| ~~28.~~ | Do jet planes have to takeoff and land on certain runways because of weather conditions? | — | — | — | — |
| ~~29.~~ | Do all airplanes have to circle the airport before landing? | — | — | — | — |
| ~~30.~~ | Do jet planes have to fly at lower altitudes depending on weather conditions? | — | — | — | — |

Now we have a series of True-False questions :

| | | TRUE | FALSE | DK | NR |
|---|---|---|---|---|---|
| ~~31.~~ | Politics in this country are controlled by only a handful of persons or families. | ____ | ____ | — | — |
| ~~32.~~ | Most local government officials are honest. | ____ | ____ | — | — |
| ~~33.~~ | Most people don't care what happens to the next fellow. | ____ | ____ | — | — |
| ~~34.~~ | Nowadays a person has to live pretty much for today and let tomorrow take care of itself. | ____ | ____ | — | — |
| ~~35.~~ | Any devices designed to reduce aircraft noise will prove too costly to be practical. | ____ | ____ | — | — |
| (36) | Aircraft designers are doing all they can to produce quieter engines. | ____ | ____ | — | — |

| | | TRUE | FALSE | DK | NR |
|---|---|---|---|---|---|
| 37. | The airport is operated in such a way as to serve the best interests of the entire city. | ___ | ___ | ___ | ___ |
| ~~38.~~ | A person should not have to put up with aircraft noise. | ___ | ___ | ___ | ___ |
| 39. | Community leaders are doing all they can possibly do to reduce aircraft noise in this city. | ___ | ___ | ___ | ___ |
| 40. | Airport authorities are doing all they can possibly do to reduce aircraft noise. | ___ | ___ | ___ | ___ |
| ~~41.~~ | Aircraft noise is rather pleasant and soothing. | ___ | ___ | ___ | ___ |
| 42. | This city can be proud of the services its airport provides to both the community and to its clients. | ___ | ___ | ___ | ___ |
| 43. | The advantages to the community from having a large airport far outweigh any disadvantages. | ___ | ___ | ___ | ___ |
| ~~44.~~ | Airport authorities probably are not very much concerned with what the average citizen thinks about them. | ___ | ___ | ___ | ___ |
| 45. | Airport authorities try to avoid sending many flights over heavily populated areas. | ___ | ___ | ___ | ___ |
| ~~46.~~ | Most business firms and leaders in this city are simply pawns of different governmental officials and agencies. | ___ | ___ | ___ | ___ |
| ~~47.~~ | It is not likely for an airplane to crash in this area. | ___ | ___ | ___ | ___ |
| 48. | The defense of our country is not possible without military aircraft. | ___ | ___ | ___ | ___ |
| ~~49.~~ | Most individuals and groups that protest about airplane noise do so because they are genuinely interested in eliminating the annoyance to themselves and others. | ___ | ___ | ___ | ___ |

| | | TRUE | FALSE | DK | NR |
|---|---|---|---|---|---|
| ~~50.~~ | People who complain about airplane noise are only trying to gain personal fame and advancement. | ____ | _____ | __ | __ |
| ~~51.~~ | Most people are sometimes frightened by aircraft noise. | ____ | _____ | __ | __ |
| ~~52.~~ | Most people are often frightened by aircraft noise. | ____ | _____ | __ | __ |
| ~~53.~~ | Airplane noise can damage a person's health. | ____ | _____ | __ | __ |
| ~~54.~~ | Airline companies will do nothing about airplane noise unless they are forced to. | ____ | _____ | __ | __ |
| (55.) | Air transportation is the only practical way of long-distance travel. | ____ | _____ | __ | __ |

~~56.~~ Do you think that a jet plane could safely land at less than full power?

YES_____; NO_____ DK_____; NR_____

~~57.~~ Have you flown as a passenger on a jet plane once, twice or more, or never?

ONCE_____; TWICE OR MORE_____; NEVER_____

~~58a.~~ Do you think air travel is as safe as cars?

YES_____; NO_____; DK_____; NR_____

→ ~~58b.~~ (IF YES): Is it safer?

YES____; NO____; DK_____; NR_____

~~59.~~ Do you think pilots consider the people below them when they take off and land?

YES_____; NO_____; DK_____; NR_____

90. Do you think pilots try to hold down the noise made by their planes?

YES_____; NO_____; DK_____; NR_____

91. Do you think that noise made by planes at the terminal and while on the ground could be reduced?

YES_____; NO_____; DK_____; NR_____

92. Who is responsible for reducing the noise from airplanes? The pilot, the airport authorities, the manufacturers, or who? (CHECK MORE THAN ONE, IF NECESSARY)

PILOT_____; AIRPORT AUTHORITIES_____; MANUFACTURER_____;

OTHERS_____

DK_____

63a. ~~What kinds of~~ How many clubs or organizations do you work with or participate in? For example: educational, recreational, political, social, business, church, fraternal, or any other such groups.

| 63b ORGANIZATION | 63c PURPOSE | 63d MEETS | 63e ATTENDS | 63f OFFICER | COMMITTEE | MEMBER ONLY |
|---|---|---|---|---|---|---|
| | | | | | | |
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(IF INVOLVED IN ONE OR MORE ORGANIZATIONS):

~~63b~~. What are these organizations?
(RECORD IN COLUMN 63b)

~~63c~~. What is the purpose of these organizations? For example, discussions of current events, service to the community, brotherhood, socializing, etc.?
(RECORD IN COLUMN 63c)

~~63d~~. How many times did the organization(s) meet in the last year?
(RECORD IN COLUMN 63d)

~~63e~~. How many times did you attend meetings in the last year?
(RECORD IN COLUMN 63e)

~~63f~~. Were you or are you now an officer or committee member in any of these organizations?
(RECORD IN COLUMN 63f)

(IF ANY ORGANIZATION INTERESTED IN AIRCRAFT NOISE, ASK QUESTION 64.)

~~64.~~ Do you think they could succeed if they tried to do somethink to improve or reduce aircraft noise?

YES_____; NO_____; DK_____; NR_____

65) How many people including yourself, any children, and relatives live here?_____ DK_____ NR_____

66a) Who is the head of the household in this house?

_____ _____ DK_____ NR_____

66b) Is he (she) employed now, at the present time?

YES_____; NO_____; DK_____; NR_____

66c) What sort of work does (HEAD OF HOUSEHOLD) do, that is, what does he (she) do on the job?

OCCUPATION_____ _____

DK_____ NR_____

(IF RESPONDENT IS NOT THE HEAD OF THE HOUSEHOLD, ASK QUESTION 67, OTHERWISE GO TO QUESTION ~~68a~~ 69

67a) Do you have a job away from home?

YES_____; NO_____; DK_____; NR_____

~~67b~~) (IF YES): What sort of work do you do?

OCCUPATION_____

~~67c.~~) (IF NO, INDICATE STATUS; i.e., HOUSEWIFE, STUDENT, RETIRED, ETC.)

HOUSEWIFE_____; STUDENT_____; RETIRED_____; DISABLED_____;

OTHER, SPECIFY_____

~~68a~~. Are you or anyone in your family employed at this time at an airport or by an airline company?

YES_____; NO_____; DK_____; NR_____

~~68b~~. (IF YES): What type work does he (she) do? (MECHANIC, CLERK, MANAGER, ETC.)

_____

_____

~~68c~~. Have you or anyone in your family ever worked or been employed at an airport or by an airline company?

YES_____; NO_____; DK_____; NR_____

69. Here is a card with typical family incomes. (HAND RESPONDENT CARD 3) Which category most nearly represents your total family income -- from all sources and before taxes?

(CIRCLE NUMBER) 1 2 3 4 5 6 7 8

REFUSED TO ANSWER_____ DK_____

(TAKE BACK CARD 3)

70a. What is the highest grade of school head of household/you has/have completed?

| | |
|---|---|
| GRADE SCHOOL (1-8) | _____ |
| HIGH SCHOOL (9-12) | _____ |
| 1-3 YEARS COLLEGE | _____ |
| COLLEGE GRADUATE | _____ |
| MORE THAN 4 YEARS COLLEGE | _____ |
| DK | _____ |
| NR | _____ |

70b. In which age category does/do head of household/you belong?

20-29 ___

30-39 ___

40-49 ___

50-59 ___

60-69 ___

70+ ___

71a. Do you own your home or are you renting?

OWN_____; RENT_____; DK_____; NR_____

71b. (IF OWN): How much would a home like this rent for in this neighborhood, not including furniture and utilities?

UNDER $75____; $75-$124_____; $125-$174_____; $175-$224_____;

$225-$274_____; $275-$324_____; $325-$374_____; $375-$424_____;

$425 OR MORE_____

71c. (IF RENT): Approximately how much do you pay for rent?

UNDER $75_____; $75-$124_____; $125-$174_____; $175-$224____;

$225-$274_____; $275-$324____; $325-$374_____; $375-$424____:

$425 OR MORE_____

72. How many times have you moved within the past ten years?

(CIRCLE NUMBER) 0 1 2 3 4 5 6 7 8 9 or more DK__NR__

(73) How often do you visit or drop in on relatives or friends? Use the Opinion Thermometer.

(CIRCLE NUMBER) 0 1 2 3 4 DK_____ NR _____

~~74~~. Do you have a fireplace?

YES_____; NO_____; DK_____; NR_____

~~75~~. Do you have central air-conditioning, window air-conditioning, evaporative coolers, or fans?

YES_____; NO_____; DK_____; NR_____

~~76~~. Does the building have insulation in the walls or between the ceiling and the roof?

NO _____
WALLS _____
ROOF _____
BOTH _____
DK _____
NR _____

~~77~~. Are your windows made of single or multiple thicknesses of glass?

SINGLE ____
MULTIPLE ____
BOTH ____
OTHER ____
DK ____
NR ____

~~78.~~ Does the building have storm windows?

YES_____; NO_____; DK_____; NR_____

~~79.~~ Does the building have an attic or a space between the ceiling and the roof?

YES_____; NO_____; DK_____; NR_____

~~80.~~ What is the outside of this building made of?

| | |
|---|---|
| WOOD OR STUCCO | ____ |
| MASONRY (BRICK, STONE, CEMENT, ETC.) | ____ |
| WOOD AND STUCCO/MASONRY | ____ |
| ASBESTOS/SHINGLE | ____ |
| OTHER | ____ |
| DK | ____ |
| NR | ____ |

~~81.~~ About how thick are the exterior walls?

| | |
|---|---|
| LESS THAN SIX INCHES | ____ |
| SIX TO TWELVE INCHES | ____ |
| MORE THAN TWELVE INCHES | ____ |
| DK | ____ |
| NR | ____ |

~~82.~~ How many windows and glass doors are there?

_____ DK_____ NR_____

~~83.~~ How many outside doors (excluding large glass doors) do you have?

_____ (RECORD NUMBER) DK_____ NR _____

(IF DWELLING UNIT IS OTHER THAN A SINGLE-UNIT HOUSE I.E., AN APARTMENT, DUPLEX, ETC., ASK QUESTION 85):

~~84.~~ How many walls are exposed to the outside?

_____ DK_____ NR_____

~~85.~~ (DOES THE RESPONDENT LIVE ON THE TOP FLOOR OF A MULTI-UNIT STRUCTURE?)

(YES_____; NO_____)

(86) In case I've forgotten anything and we need to call, what number should we call, and what would be the best time of day?

NUMBER:_____ BEST TIME:_____

(87) May I please have your name?

_____

(88) What is your address here?

_____

(RECORD NAME AND ADDRESS ON COVER)

(89) (INTERVIEWER: SEX OF R)
Male ___ Female ___

(90) (INTERVIEWER: ETHNIC GROUP OF R)
A___ N ___ S ___ O ___

# APPENDIX C

# COMPLAINT FORMS

# TELEPHONE CALL MESSAGE FORMS USED FOR COMPLAINT RECORDS BY FAA NOISE ABATEMENT OFFICE (A) AS SUPPLIED BY TRACOR FOR DPRS TRIAL PERIOD (B) GSA STANDARD FORM

A

MEMORANDUM OF CALL

No 4701

TO: _____

FROM: Miss ☐ Mr. ☐ Mrs. ☐ _____

OF (ADDRESS OR ORGANIZATION) COMMUNITY

_____

☐ PLEASE PHONE ⟶ # _____

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE

| RECEIVED BY | DATE | TIME ☐ AM ☐ PM |
|---|---|---|
| | | |

TRACOR™ DPRS STUDY

B

MEMORANDUM OF CALL

TO: _____ _____

☐ YOU WERE CALLED BY— ☐ YOU WERE VISITED BY—

OF (Organization) _____

_____

☐ PLEASE CALL ⟶ PHONE NO. CODE/EXT. _____

☐ WILL CALL AGAIN ☐ IS WAITING TO SEE YOU

☐ RETURNED YOUR CALL ☐ WISHES AN APPOINTMENT

MESSAGE

| RECEIVED BY | DATE | TIME |
|---|---|---|
| | | |

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