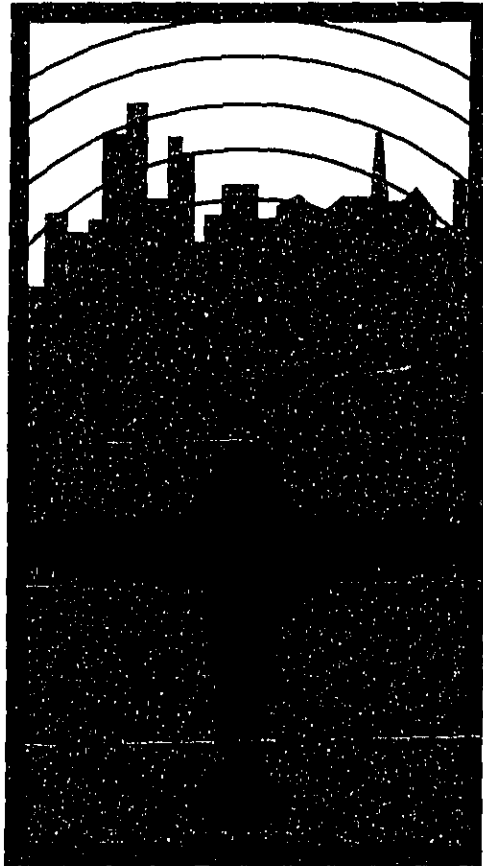


N-96-01
II-A-121

Conference on General Aviation Airport Noise and Land Use Planning



Volume III Proceedings

October 3-5, 1979

Georgia Institute of Technology

Prepared Under Contract G8-01-5040
For Environmental Protection Agency,
Office of Noise Abatement and Control

TECHNICAL REPORT DATA <i>(Please read Instructions on the reverse before completing)</i>		
1. REPORT NO. EPA 550/9-80-320	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Conference on General Aviation Airport Noise and Land Use Planning Vol. III. Proceedings	5. REPORT DATE Approved February 1980	6. PERFORMING ORGANIZATION CODE
	8. PERFORMING ORGANIZATION REPORT NO.	
7. AUTHOR(S) Edited by Clifford R. Bragdon	10. PROGRAM ELEMENT NO.	
9. PERFORMING ORGANIZATION NAME AND ADDRESS College of Architecture Georgia Institute of Technology Atlanta, GA 30332	11. CONTRACT/GRANT NO. EPA 68-01-5161	
	13. TYPE OF REPORT AND PERIOD COVERED Final, 3-5 October 1979	
12. SPONSORING AGENCY NAME AND ADDRESS Office of Noise Abatement and Control U.S. Environmental Protection Agency Washington, D.C. 20460	14. SPONSORING AGENCY CODE EPA/ONAC ANR-471	
	15. SUPPLEMENTARY NOTES	
16. ABSTRACT <p>This report constitutes the proceedings of the three day conference on general aviation airport noise and land use planning. Included are advance copies of the speakers' presentations that were available at the conference, a summary of each of the five panels, a noise bibliography, and a transcription of all discussions including audience participation.</p> <p>The conference was unique in the sense that a diverse group of individuals were invited to attend representing the wide range of constituents of general aviation. They were encouraged to participate by expressing their interests and views and to interact with each other. Because of the novel aspects of the conference and the fact that there is no comparable information available elsewhere, it was determined to reproduce all discussions as accurately as possible. It is anticipated that other conferences of this nature will be held and that this report will provide valuable background and reference information.</p>		
17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Aircraft Noise, Airport Noise, Aviation Noise, Avigation Easement, Community Response, FAR Part 36, General Aviation, Joint Use Airports, Land Use Planning, Noise Abatement Flight Procedures, Noise Compatible Land Use, Noise Impact, Zoning.		
18. DISTRIBUTION STATEMENT Release Unlimited	19. SECURITY CLASS <i>(This Report)</i> Unclassified	21. NO. OF PAGES
	20. SECURITY CLASS <i>(This page)</i> Unclassified	22. PRICE

N-96-01
II-A-121

EPA 550/9-80-320

**CONFERENCE ON GENERAL AVIATION AIRPORT
NOISE AND LAND USE PLANNING**

VOLUME III PROCEEDINGS

3-5 October 1979

**Georgia Institute of Technology
Atlanta, Georgia**

Prepared For:

**U.S. Environmental Protection Agency
Office of Noise Abatement and Control**

Under Contract No. 68-01-5161

This report has been approved for general availability. The contents of this report reflect the views of the contractor, who is responsible for the facts and the accuracy of the data presented herein, and do not necessarily reflect the official views or policy of EPA. This report does not constitute a standard, specification, or regulation.

TABLE OF CONTENTS

	Page
Foreword	iii
Morning Session: October 3, 1979	1
Afternoon Session: October 3, 1979	37
Morning Session: October 4, 1979	89
Afternoon Session: October 4, 1979	141
Morning Session: October 5, 1979	179
Afternoon Session: October 5, 1979	229
Glossary	265

FOREWORD

This is volume III of the report on the Conference on General Aviation Airport Noise and Land Use Planning at Georgia Institute of Technology, October 3, 4, and 5, 1979. It contains verbatim transcripts of the panel discussions together with a glossary of some of the terms used in the discussions.

Volume I presents summaries of panel discussions held at the conference. Volume II includes the 12 prepared papers which were presented at the conference.

The verbal presentations at the conference differed in content and format from these prepared papers and there was general discussion of each subject after the verbal presentation.

CONFERENCE ON GENERAL AVIATION AIRPORT NOISE
AND LAND USE PLANNING

GEORGIA INSTITUTE OF TECHNOLOGY

SPACE SCIENCE BUILDING II

- - -

MORNING SESSION

October 3, 1979

9:00 o'clock a.m.

(The conference on General Aviation Airport Noise and Land Use Planning, co-sponsored by the United States Environmental Protection Agency, Office of Noise Abatement and Control, and Georgia Institute of Technology, convened at the Space Science Building II, Georgia Institute of Technology, on October 3, 1979, commencing at the hour of 9:30 o'clock, a.m., with Dr. Clifford Bragdon, Director, Program for Interdisciplinary Studies, Georgia Institute of Technology, presiding.)

DR. CLIFFORD BRAGDON: Good morning. I am Clifford Bragdon, a Professor of City Planning here at Georgia Tech and Conference Director for what we hope will be quite an interesting conference for people from a variety of diverse groups to come together and talk about a subject that really links us together.

For the conference, we do have a court reporter, Ms. Suzanne Miller, who will be transcribing the entire conference, both formal remarks and also the discussions. Those then will be edited, reproduced, and printed and they will be distributed as part of the proceedings to all of the attendees here and EPA will be distributing those in some quantities through their office in Washington. Also, we have received over 100 requests from people who cannot be here but who do want to receive the proceedings. We will have the proceedings published and the time will probably be about two months after the final conference. Those will be available in addition to the remarks that you have or will receive in the book.

In terms of format, we will have an opportunity to have a maximum, we hope, of interaction. Each of the speakers will be making a presentation which should be 20 minutes in length. Each of the speakers will have the opportunity of addressing their subject for up to one-half hour. We have instructed the speakers to try to limit it to 20 minutes and allow 10 minutes after their formal speech to have comments from the floor and at that time we will answer those questions, following the four speakers.

Then for each of the sessions we will have a series of panelists with the speakers on the platform up here after the four speakers have finished. At that time we will have approximately one hour for discussion between panelists and speakers and also between people on the floor with the panelists and the speakers. The whole idea here is to maximize the chance for everybody to get together in a type of dialogue if you care to do so.

On Thursday night all the people here, as part of the registration fee, are invited to a dinner-banquet which is being held at The Sheraton-Atlanta Hotel. There will be a social hour from 6:00 to 7:30. Following that, we will have dinner from 7:30 to 8:30 p.m. Our dinner speaker is Congressman Ambro (Jerome A. Ambro) who is a member of the Aviation Subcommittee as well as the Science and Technology Committee in Washington, D.C.

Turning to the program, we are going to try to minimize introductions to maximize the time to get together and get to know each other a little better. All of you who are attending -- and we will have approximately 110 people here -- have been invited, which in itself becomes somewhat unique. Too, we feel the people here are representative of a cross section of interest groups in the decision-making area who will influence and have a way of influencing the decision process. Hopefully, one of the objectives will be meeting people from other disciplines, whom you have never met, and I hope that will occur. That is one of our interests in having this conference.

I might add that we really have no preconceived notions as to what the overall outcome of the conference will be. We want to create the opportunity for people to meet together from a collective background of experience and interdisciplinary interests to try to focus on a problem that

could be, quote, a problem. I think it is important because unlike air-carrier operations, we will be looking at general aviation before it may become a problem. So it is really a conference dealing with prevention rather than reaction, which is a very unique opportunity which most of the parties never have.

We want to encourage interaction between the speakers, the panelists, and the attendees. Our interest is really to establish a dialogue and as best we can to learn about all interests of all parties in terms of how to address the question of land use planning in airport development -- which is obviously a very important thing. Obviously, we will have no single answers. I have already talked to about five or ten people before the conference and they are looking for answers. They have partial answers; possibly they have a lot of problems but there aren't any single answers, and it would be a collective group such as this, hopefully, who will try to focus on things that no single person can certainly answer.

So, it really is the opportunity to learn from others, which is the whole theme of this conference, and present what you have to contribute in a constructive manner. We hope you will enjoy yourself here and avail yourselves of the City of Atlanta if you haven't had an opportunity to be here before. We will look forward to having your participation and, again, I am pleased that you are all here.

At this time I would like to introduce the Dean of the College of Architecture, Dean William Fash.

DEAN WILLIAM FASH: Thank you, Cliff. It is indeed my pleasure to welcome you on behalf of the Georgia Institute of Technology and on behalf of the College of Architecture. We are very pleased that this timely and important conference can be held here. You certainly are a distinguished group. Each of you has brought distinction to yourselves already and in representative areas of interest and activity that certainly, collected together, offers the potential to come up with some answers or some refinements of answers to a problem that besets everybody who lives here.

I think it is quite appropriate to have the conference here at Georgia Tech. Georgia Tech people have played significant roles in the development of the aircraft industry in the United States. The Guggenheim School of Aeronautics was established here in 1930, and to try to put it into perspective, that is just three years after "Lindy" crossed to Paris. Things have certainly changed a lot in the 50-odd years since.

Georgia Tech research and Georgia Tech graduates have played quite an active role in the development of what has happened in the 50-odd years since. Astronaut John Young and John Sanford, who is the President of Boeing Aircraft Company in Seattle, are examples of graduates of Georgia Tech who have had something to do with what has taken place. So I think it is fitting and proper that all of you be collected here in a place that deals with the sophisticated technology of which we are all very proud to try to find some way with which we can deal with the problems that result from that technology as well.

Personally, I am an airplane freak. Probably my first experience with building anything was with the little balsa wood models that you used to be able to buy of airplanes, where you put every little dinky piece together. It was great for motor skill development. As a result of that I still have quite a fond place in my heart for anything that has to do with airplanes and I am reminded that the sound of an airplane was once quite a beautiful sound. During the early stages of development of aircraft and probably during the war years particularly the sight and the sound of an airplane coming home really was quite beautiful and it stirred people's hearts and invoked great feelings of pride.

I think it is with the airplane as it has been with the automobile. Melvin Kranzberg, a member of the faculty here at Tech involved with the history of technology, speaks about the automobile and calls attention to the fact that at one time the automobile was seen as a great magic answer to the problems of pollution in the cities that came from all the horse-driven carriages. Now the automobile has become a source of pollution in the cities and presents an old problem needing a new answer.

I think pretty much the same thing has happened with the airplane. Air travel has once been seen as a modern miracle enabling people to move a long way quickly. Now that the airplane and air travel have become commonplace we respond more to the problems that have been created by them than to the wonder of them. I happened to be near an airport last night. This one was a military airport -- without any intention of calling attention to that type of airport -- but being there certainly brought home the reality that there is a problem in residential areas and in developments around airports.

We think of the problem from the perspective of an advanced country with advanced and sophisticated technology. It is really a growth problem and when we remember that two-thirds of the world population lives in the southern hemisphere and think about what is going to happen as these countries develop -- and they are very busy trying to develop -- what will happen to them, as well as to us, as technology advances unless we can find some better answers than we have to carefully plan around the airports and how to control the pollution resulting from the noise. I think we need answers badly.

Cliff spoke of the conference as dealing with prevention so far as general aviation is concerned, trying to learn from the history of the air carrier industry and I think nothing could be more timely or appropriate than to bring all of you together to address such questions. I am hopeful that the conference will prove to be the stimulus for finding some new answers for some changes in answers that will work better.

I welcome you and I certainly wish you every success. If we in the college or here in Georgia Tech can be of any help to you in any way while you are here I hope that you will make some noise.

DR. BRAGDON: Thank you for those remarks. I am pleased at this time to introduce Charles Elkins. Chuck Elkins is Deputy Assistant Administrator for the Office of Noise Abatement Control, U.S. Environmental Protection Agency, located in Washington, D.C.

MR. CHARLES L. ELKINS: I want to welcome you to this EPA Conference. If you have been to any conferences lately you may have heard the joke about the three most unbelievable statements. Don't worry, I am not going to repeat the joke in its entirety but the joke leads up to the punch line, "Hi! I am from the Federal Government and I am here to help you." That certainly is unbelievable but I think maybe another version of that may be that one of the three most unbelievable statements would be that I am from the EPA and I want to help you. I am providing you with a conference where I expect you to be the main beneficiary rather than the EPA.

Now, that is unbelievable because we all know that EPA wants to regulate the world and we are testing whether or not this economy or any economy so regulated and so controlled can endure. I wouldn't blame you if as you have gone over your agenda, you have looked to see whether there are some things written between the lines there, some kind of hidden objectives that appear if you look at it while holding it over a candle to see what might come out on the secret writing. But I want to assure you that it is all there in black and white and that it will, hopefully, come to surface -- not the usual bum rap the EPA gets in the newspapers, that we just had a weak moment and designed the whole conference to double the taxpayers' money -- that it will be beneficial to you and I am hopeful that you will be convinced that the dialogue which goes on here the next three days will be quite worthwhile to you as individuals and the groups that you represent and that you will find that out without any heavy hand of a regulatory agency, from EPA, FAA or anyone else out of Washington.

Of course, it is because of that main theme and purpose of the conference that we in EPA are hopeful that the conference will play a major role in charting the course of general aviation development in the future. Our focus, of course, is on general aviation noise, noise in the neighborhoods that surround the nation's airports and, clearly, general aviation does produce noise in neighborhoods. But how much of a problem really is this? Will it get worse in the future? Are there adequate remedies to be adopted by the affected communities, by the manufacturers? And if the answer is "yes" to any of those questions, how soon must that action be taken? So these are the questions which I hope among others that we can talk about during these three days.

I would like to take a moment to thank Cliff Bragdon of Georgia Tech for organizing this conference and acting as our conference host. He, along with Bill Sperry and John Schettino of my staff, has put together what I hope will be an excellent conference for you. Cliff is well known to many of you for his leadership in noise and land use planning and he seemed a perfect choice as the person who could bring us all together to discuss these serious matters in a relaxed and non-adversarial atmosphere.

So, first of all, what is EPA doing, holding a conference on this particular subject? Well, most of you probably know that EPA has been in the noise business since the passage of the Noise Control Act back in 1972, and the Act laid out Congressional policies to promote an environment for all Americans free from noise that jeopardizes their health and welfare. That is quite a tall order.

Specifically, that Act directs EPA to design and carry out a national program to abate and control noise. Now, because of FAA's active role in the aviation noise area, EPA was given an advisory role in that area and a regulatory role with regard to all other environmental noise sources. Those of you who have followed the aviation noise area during the last few years know that we in EPA have focused most of our aviation noise activities on the problem of the commercial fleet. We have made a number of regulatory proposals to the FAA and have been actively involved in the promotion and implementation of noise abatement planning at the Nation's commercial air carrier airports. Significant progress has been made in this area but, of course, much still needs to be done.

Reauthorization of the Noise Control Act, which is now pending before Congress -- and if Congress would stay in session instead of going home for the holidays maybe we will get it passed -- requires EPA to prepare a five-year plan for its activities for the coming years. The mandate is explicit in requiring EPA to update its 1973 Report to the Congress on Aviation Noise, which some of you may remember. One of the purposes of this conference then, from my point of view, is to provide guidance to us in EPA about our activities in the general aviation area during the next five years and the years beyond.

Now, we have been impressed with the difficulty in the air carrier area of trying to control aviation noise in a situation where the problem is already severe and the order of the day is abatement and retrofit rather than prevention. One needs only to read the newspapers to realize that noise has become a real albatross around the neck of the commercial air transportation system and it is a public nuisance for the neighborhoods around most of our major airports.

The noise problem from general aviation is clearly not that acute and yet the rapid growth projected for the future for general aviation raises the question of whether preventive steps are needed now in order to avoid serious political and economic constraints on the growth of this valuable part of the Nation's air transportation system.

Now, by its very nature, prevention of a future noise problem at general aviation airports would involve many actors, not just the Federal Government. In fact, the major burden for prevention would most probably fall on the private sector and on States and localities. Those who would expect the Federal Government to solve this problem would not be in my view very good students of contemporary political science. Thus, although we in EPA have taken the initiative and called this conference -- and we want to see what role we might play in the future in this area -- the focus of this conference must be much broader.

If a preventive program is needed, what mutually supportive roles might a whole variety of parties take in this effort? Now, we in the EPA are prepared within the limits of our statutory authority to draft regulations for consideration by the FAA in this area, give financial assistance under the Quiet Communities Act to local communities and States for airport noise abatement planning and continue to help bring together interested parties for discussion and possible agreement on appropriate courses of action. Deciding whether EPA plays such a role is less important for this conference than

identifying whether or not there will be a noise problem in the future and laying out what actions might be appropriate to minimize this problem.

Now any assessment of the potential seriousness of the general aviation noise problem must begin, we believe, with an assessment of the effects of noise on people. I think it is always surprising that those people who come to the noise area from another field -- and that may be most of us at some point in our career -- find that so much is already known about the effects of noise on people, because, although noise is an environmental pollutant, it is much less well known than, say, air and water pollution, although noise is the most pervasive of our environmental pollutants and it has the longest history.

Long before man knew that the water and air he was drinking and breathing were bad for his health, he knew the difference between sound and noise -- and he knew he didn't like the noise. Noise is the one pollutant which nature has given us the ability to monitor. We don't need a Government bureaucrat to tell us whether noise is out there or not because the fear of a loud noise is one of the two fears we are born with and our bodies still react to a loud noise even though we may consciously think that we are ignoring it. But this natural aversion to noise has been borne out by subsequent scientific research and we have found now that our automatic response to noise has turned out to be quite sensible -- but for far more subtle reasons than we originally suspected.

Now, most of us today are aware of the impact of noise on our hearing. Millions of Americans today have severe hearing loss because of their exposure to noise. What is perhaps not known by most Americans, however, is that people risk losing their hearing in the presence of much lower exposure levels than they would ever suspect are hazardous. On the basis of the latest scientific evidence, we in EPA have established an average level of 70 decibels over a 24-hour period as the level necessary to protect the public from significant adverse effects on their hearing, with an adequate margin of safety. Those who are exposed to higher levels than this for 40 years or more run the risk of losing some of their hearing and, needless to say, millions of Americans are exposed in this country to levels of noise significantly above 70 decibels, particularly in their employment -- also around some of our major airports.

Of course, noise control ordinances across the country and lawsuits against airport proprietors today are based not so much on a concern for hearing loss on the part of the public but on something more fundamental. People just don't like noise. It is hard to find words to characterize this aversion to noise. The traditional word of the art in the scientific community is "annoyance," but generally we all use the word annoyance to signify something not very serious. Those of you who have had to deal with angry citizens around airports know they certainly do not regard aviation noise as some insignificant irritant in their lives, so the word annoyance is certainly a misnomer.

As the scientific community has searched for an understanding of this type of reaction, they have found, as you would expect, that environmental noise interferes with normal conversation and a number of relaxing and educational activities on which people put a great deal of value. Those hours

spent in the home after a hard day's work in the office or factory are in some ways more valuable to us than the other hours of the day, and yet that seems to be where noise intrudes the most. It also disrupts sleep, and if a person lives in an environment that is continually impacted by noise each night, such as near a major airport, the destruction of sleep could become a serious health problem for that person.

Based on these impacts, EPA has identified a day-night average level of 55 decibels as the level necessary to avoid most of these difficulties, but recently scientists have been focusing on a more fundamental aspect of noise. The annoyance reactions that scientists have identified so far may only be the tip of the iceberg when it comes to the real health effects of noise. The facts aren't in yet but there are some very serious signs in front of them. We have known for some time, of course, that noise is a stressor and the body reacts to stress in many subtle ways that we are not conscious of. Noise triggers an automatic response in our bodies which is not controlled by our conscious minds -- it probably stems from the fact, as I mentioned, that the fear of loud noise is one of the two fears we are born with and we can never forget it. Outwardly, we may seem quite calm in the presence of noise but internally our heart rate goes up, our blood pressure goes up and adrenalin is secreted, and our bodies are prepared for the suspected assault which is associated with noise.

We in EPA are currently sponsoring a study of Rhesus monkeys at the University of Miami in conjunction with the National Institutes of Health. This study stems from the fact that there are over 40 epidemiological studies from foreign countries which show a relationship between noise and cardiovascular disease. This preliminary monkey study has shown that after several months of noise exposure -- which is similar to that received by millions of working Americans today -- the monkeys have sustained an elevated blood pressure of 30% even after the noise source was removed. It is too early to draw conclusions from this experiment, further research is necessary, but beginning with the fiscal year that just began this week EPA has a small amount of money to kick off further research in this area. But if noise is in fact tied to elevated blood pressure hypertension, the control of noise may become one of the foremost public health programs in the country, since hypertension is directly linked to heart-disease and stroke -- and these two diseases alone account for 48% of the people who die in this country every year. Cancer is a small problem compared to those.

So, in short, noise is not something we can laugh at or tell ourselves that it is something we can get used to. It is a serious health problem and the evidence is tending to indicate that the effects could be more serious and much more wide-ranging than we ever imagined in the past.

Now, from the point of view of the airport proprietor, it may matter less exactly what the health effects of noise are and more that angry airport neighbors can prevent an airport's expansion and improvement. Their lawsuits and political activity could in the future significantly slow, if not stop the growth of the air transportation system. Rightly or wrongly, citizens in this country are becoming less and less tolerant of public officials who make pronouncements that airport expansion is for the public good and that private individuals must give up their property rights and suffer in order that others may fly or otherwise have the convenience of the airport.

So from many perspectives, noise is an environmental pollutant to be reckoned with and it behooves us to examine the extent to which noise is already a serious problem around some of our general aviation airports and whether or not growth of the industry will exacerbate this problem significantly in the coming years.

As we begin this conference, what do we know about the noise characteristics of the general aviation fleet? Let me just go quickly over them. Putting aside the military aircraft, there are approximately 185,000 aircraft registered for operation in the United States and only about 3,000 of these civil aircraft, as you know, are operated by air carriers as part of the commercial transportation system. So the rest, 182,000, are operated as general aviation aircraft by individuals, businesses, and governments. Most of these aircraft, as you know, are propeller-driven rather than jet powered, although jets are gaining a larger share of the fleet every year.

These 185,000 civil aircraft operate into approximately 14,000 airports in this country. Half of these 14,000 airports are open to the public and about 600 of these are certificated for air carrier operations. It is estimated that we have about 130 million operations annually at these public use, general aviation airports with daily operations maybe up to about 500 a day, and FAA estimates that these operations may grow double that, almost double that to 220 million by 1987. Perhaps John Wesler can give us a closer insight into those numbers, but the general trend seems to be an increase from about 185,000 general aviation aircraft to 240,000 of the same type of aircraft in that period.

Now, most of the country's attention, as you know, has been focused on the 100 largest air carrier airports. Our analysis of these air carrier airports indicates that in 1975 approximately 6 million people were exposed to noise levels of a day-night average of 65 decibels or greater due to air carrier aircraft alone. A number of steps have been taken recently which will bring down the number of people exposed to these high levels of noise over the next several years, with the greatest benefit occurring sometime around the year 1985 when the retrofit/replacement rule will be fully implemented -- if the Congress doesn't meddle with that regulation.

Unfortunately, because of the growth in size of the commercial aircraft fleet and increased operations, we can expect the number of people exposed to start going back up significantly after that date and, consequently, we in EPA are actively encouraging further steps to reduce exposure to commercial aviation noise around our Nation's airports. Now, we know very little about the noise at the rest of these 13,000 airports serving the general aviation fleet. We also realize we know very little about the noise contribution of general aviation to the noise problem at our major air carrier airports.

EPA has undertaken studies at the present time to predict the noise exposure from these aircraft, both now and in the future, but the numbers of aircraft and airports are so large that it will be some time before we have a fully comprehensive national view of the scope of the problem. Now, surely, general aviation noise is a serious problem at some airport but we at EPA have no preconceived ideas about the severity of this problem and the extent to

which it may become a national problem. We cannot look at just the aircraft or their operations, we must consider the airport as well. If land use around the airport has evolved wisely, there may be little or no disturbance for the community. On the other hand, ambient noise levels in the communities surrounding general aviation airports may be significantly lower than around our major commercial air carrier airports; thus, the general aviation noise may be more intrusive for those neighborhoods than for people who live around some of our commercial airports. Consequently, the fact that general aviation aircraft are quieter than commercial jets is no reason for complacency; thus, the possible noise problem associated with general aviation is not just a technological matter. There are socio-economic and environmental implications which must be considered as well.

We are anxious to hear from each of you in this conference concerning the extent to which you believe, based on your experiences, that general aviation is a problem today or will be one in the future. This will help guide future studies by the Federal Government in this area and give us all a sense of perspective on general aviation noise.

Now, if general aviation noise is today or will be in the future a serious problem for this country, what can be done about it? I hope in this conference we will hear a lot about that, but I think it will come as no surprise to any of us that there is no single solution to a problem as complex as aviation noise. In our experience in the commercial aviation noise area, we have found that any realistic solution to the problem must combine actions by a variety of parties, all taken in coordination with each other. Needless to say, orchestrating such a control program is very difficult, particularly when large investments have already been made on the basis of the status quo. That is why working on the general aviation noise problem before it becomes a national crisis is attractive. Prevention is usually much cheaper and much easier to bring about politically than retrofit and abatement. Instead of making investments obsolete, as we must do in some cases in the commercial aviation area, a preventive program might be able to focus future investments with little additional cost involved.

Now, when people talk about quieting any aviation problem they usually think first about quieting the source of the noise, which in this case are the aircraft themselves. Some steps have already been taken by the aircraft industry to produce quieter aircraft and, for this reason, it is no longer possible for us to talk about quiet propeller aircraft and noisy jets. Some of our new jet aircraft today are quieter than propeller aircraft and, hopefully, quieter operation is the trend for the future for both types of aircraft. At the same time, NASA is conducting research with assistance from EPA and FAA to develop quieter propeller-driven and jet-powered general aviation aircraft. We are hopeful that some technological advances, even if they are only small ones, will result. But, of course, there is no automatic link-up between technological innovation in the laboratory and the incorporation of such improvements in the aircraft of the future.

One of the difficult policy problems for any person in the Federal regulatory arena, such as EPA or FAA, is the extent to which the manufacturers can be expected to aggressively move ahead to incorporate new technology and to develop new technology of their own instead of waiting to be forced to do

so through some type of Federal, State or other local agency, or for that matter, government regulation.

Quieting of the source of noise has proven to be in and of itself insufficient to solve the commercial aircraft noise problem and may well prove to be so in the general aviation area as well. Ways in which the aircraft are flown and the way in which airports are developed and expanded can have a major influence over the amount of noise exposure in the neighborhoods surrounding general aviation airports. New takeoff procedures incorporated now in an FAA advisory circular will provide considerable relief to airport communities surrounding air carrier airports in the future if the circular is complied with by the air carriers. Similar improvements in takeoff and landing procedures might provide some relief from general aviation aircraft also.

And then there is the area of land use control. This country has been notoriously unsuccessful in controlling the land use around airports. Even airports as modern and advanced as Dallas-Fort Worth, and Dulles in Washington are now beginning to suffer from encroachment from residential communities. Communities that once vowed that they would hold fast to decisions to ban incompatible land uses are now caving in to the economic pressures to allow residential development in areas impacted by the airport noise. Thus, we can expect that even our airports which are built out in the countryside will soon be subject to lawsuits by citizens who are outraged by the increasing noise coming from these major facilities.

We need to seek stronger and more effective methods for controlling land use around commercial airports. The question for us then at this conference is whether such advances can be pioneered and perfected in the general aviation area where economic pressures today are not quite as great as they are around commercial airports but where the need in the future may be just as great.

We have in this audience today and during this week, people who can give us a good perspective on the potential for the various means of dealing with general aviation noise. We have representatives here from Federal, State and local governments, from the aviation industry, airport operators, aircraft operators, aircraft manufacturers, representatives of environmentally concerned groups, neighborhood representatives, leaders of the real estate and lending institutions of our country, and spokesmen of the air carrier airports and military airports. Many of these groups have already had unique experiences in dealing with general aviation airport noise. Some have been involved in the adoption of regulations concerning general aviation airport uses. Some have seen these regulations struck down or are now involved in litigation concerning aviation regulations.

All of us would like to share each other's experiences. I hope there will be a mutual benefit from this exchange, and speaking for EPA we hope to gain added insight into the ways in which all of us can work better together in the years to come. So I urge all of you to make your views heard. Is there a general aviation problem today or will there be one in the future and, if so, what is its extent? Are there ways of controlling this noise in the future and how effective would each of these methods be? What actions need to be taken by some or all of us to bring about these solutions?

In order to make this conference a working conference -- that is, more than a series of lectures -- we have restricted the total number of participants. In many cases, you may be the only person at the conference with a particular perspective. So please take an active role in these discussions. Express your views so that they may affect the conclusions of the conference and thereby the policies and actions of all of us in the future.

We in EPA look forward to working for you during these next three days.

DR. BRAGDON: This next session's presentation deals with an evaluation of a land use planning matrix. The reason for establishing it was to try to get a sense of who all the role players are that enter into the process of decision making. It is interesting that all institutional groups feel that they have the pulse of the interest group and can be the spokesperson for that group, but if you take all of the associations and affiliations individually, they do not constitute an answer. It really can only be resolved in a greater understanding of the problem by the collective involvement of all the disciplines and, really, that is what we have tried to assemble here. I think from talking to Chuck among others, we have assembled quite an interesting group of people who represent a divergent group of opinions and interests and which I think is representative of sort of a cutting edge of where things are. So, I am quite pleased to have all of your participation, and if we cannot learn from one another then we are in trouble because that is really what we are here for. This is not going to be any lecture-type of setup and it is going to be the experience of everybody, shared in a collective manner.

Essentially, this matrix was devised to try to get a handle on what all these people are doing and what are the roles they have and maybe get a better look at the problem of land use planning. Historically, it has been left to some land use planners, quote, to get a handle on the process, and in all honesty that is only one role player. What we are trying to do here is to find out what the lending institutions are saying, what the regulatory agencies are saying, what the private sectors, what the manufacturers through their professional affiliations, fixed-base operators, proprietors, what are all these people saying. Naming these all collectively reflects what the land use is.

So today, essentially, land use management embodies the common thread in which we are all working together in a group. Unfortunately, we have been along a parallel track, each group doing their own thing; one, the mortgage banker with the assistance of the professional planner; two, the regulatory agencies and so forth. Today we can, hopefully, get off our single track and work together in a matrix and that is what this little matrix is.

The land early reflects an indicator of cooperativeness or lack of cooperativeness. If we look around an airport and see what is occurring, whether it be, quote, the compatible or incompatible use, the degree of compatibility reflects the value systems of the collective group that is involved in decision making -- and that is really the final test of the success or failure of land use management, the operation of the airport

relative to its adjacent environment. If it is working properly, essentially the incompatibilities are nominal or minimal.

There are real basic questions from a cost-benefit standpoint. As a professional society, should we be spending great sums of money for taking care of mistakes? Should the Atlanta Airport, the Los Angeles Airport, the Minneapolis-St. Paul Airport be spending millions of dollars to correct mistakes that have occurred? Had there been a dialogue at the outset could some of this have been eliminated or minimized in a preventable way? That is really what we are dealing with. The need for planning is critical. Everyone in this room has, I am sure, a definition of what they think planning is and I suspect if we took a definition of all those terms we would come up with probably 15 different definitions.

And who is, quote, the planner? I am sure the mortgage banker would say the professional planner, the architect, the regulatory group. All these groups feel that they are planning and surely they are but, again, in somewhat of an individual way. The thing that brought this to a head was the evaluation of 111 general aviation airports that I prepared in a report to EPA. This evaluation was really to see to what extent in general aviation there was recognition of a problem of: one, noise; two, what was the magnitude of the problem; three, what were the strategies for recognizing that problem; and; four, what were they doing about it.

In a summary of 111 airports in the United States, we found first of all that 50% of the airport master plans being done for general aviation airports did not even address the question of off-airport land use planning. Now, these plans were done from the period 1974 to 1977, so we are not talking about two or three decades ago; we are talking about a year, to a year and a half ago, two years -- and that is significant. Fifty percent of comprehensive airport plans have not addressed off-airport land use questions. Now, of those that did address that issue, we found that less than 25% were doing anything in a preventive way to minimize that impact. In other words, noise was recognized but as a question of land use was not integrated into the resolution of the problem. So if we look at 111 general aviation airports and we find that only in this group something like 30 are even addressing the question, much less resolving the question, then there is concern and that is one reason why we are here today -- to see if we can assist. There are, obviously, reasons for their lack of awareness, but I think this is something we need to look at very carefully.

Now in terms of what we have attempted to do in this matrix, we have attempted to develop two matrices. One is looking at how do we plan around airports and, secondly, how do we implement plans around airports. The planning, notoriously, is excellent in looking at what the problem is and, generally, has been unsuccessful as a single party in doing anything about it. Now that doesn't mean they are not doing something about it but it means a collective approach, so we are looking at implementation as well as the planning process.

Within this, the report contains four sections. The first is evaluation of noise control measures. What are those noise control measures that we can look at? The second identifies the parties that are involved in planning and implementation, and parties in a very broad sense. Thirdly, we

want to find out what role these parties have in, whatever term you may want to use. And then finally what conclusions can we draw.

What I would like to see, and hopefully -- many of you have expressed this -- is a general road map that has all the rules to play the game and have all those people interacting on that same road map -- so that we don't have 27 road maps, we have one. So at least we can get that type of group together and concentrate and focus in on the issue.

In terms of noise control measures, we are really talking about two types; remedial measures and preventive measures. Now the remedial measures are those that must be applied when a problem already exists. In other words, there are some incompatible conditions -- and these may include tax incentives, airport noise reduction, airport operator controls, fair disclosure, ordinance restrictions on private mortgage loans, housing relocation, and many others. Now we are not saying that these are mutually exclusive but we are saying that remedial measures are one set of strategies that have to be applied to the airport planning process.

The second is a set or series of preventive measures, and preventive measures are really to eliminate or reduce the potential for incompatible development. As you will see later in the program, we are going to have people talking about remedial strategies where they already have an existing impact problem, and others will be talking about preventive measures where a problem doesn't exist but they want to insure that a problem does not develop. So those sets of conditions are going to be different and the measures that may be necessary to be applied: such as the use of zoning, subdivision regulations, building codes, capital improvements programming, fee simple purchase, revolving purchase, installment purchase. These can be preventive measures that can minimize potentially the problem of impact to the given area.

The second area of this matrix deals with the parties. Who are the people and where do they come from? Well, the parties, essentially, come from both the public and private areas, public sector and private sector. All too frequently the planning process incorporates the public sector. The land use planners, many times, are regulatory agencies -- or at least the governmental agencies had their dialogue with the public sector and excluded, either intentionally or unintentionally, the private participation.

If, for example, the United States -- looking at HUD in terms of mortgage approval in the United States -- a Federal policy is established to have compatible development around airports through the lending process of mortgages, this has an impact on maybe 30% of all mortgages in the United States because they come through the public lending institutions or at least they are supported through the public lending institutions by HUD. But approximately 70% of all mortgages in the United States are handled through the private sector, through places like lending institutions which are not supported by HUD directly. So if we address the question of mortgage process in terms of a strategy for land use planning, we have to look at it from the viewpoint of the mortgage banker as well as the public sector. So this is the type of thing that we must examine much more carefully.

The public sector, again, is defined in the paper which you have, and it is a broad spectrum. Certainly, it involves the local planning body, the local governing body. Many times these are quite different groups, as you have found out many times I am sure in public hearings. We are also talking about the airport operator as a public operator, the State, sub-State regional authorities and then the State administrative agencies, and we have representatives from three different State offices -- California, Georgia, and Maryland -- in terms of aviation planning at the State level. Obviously, we also have the Federal Government involvement, the FAA which we have representatives from, HUD, as well as EPA. So all these groups play some role in terms of the public sector.

Turning to the private side, we have the fixed-base operator, the property owner as a private home owner or private individual, and we have representatives from these groups: neighborhood organizations and environmental groups, real estate firms, private developers, private lending institutions, aircraft engine manufacturers, planning and environmental consultants who sometimes work for the public sector, sometimes for the private sector. All of these groups collectively have some role to play in terms of noise control measures.

Now, what we have done here is to try to construct a matrix that deals with the level of involvement that these groups do play, and this involvement has either a direct involvement or indirect involvement, depending on what the issue is. Chuck Elkins alluded to it earlier. The EPA is involved in certain things in terms of conditions of aircraft but at the same time the decision making about the land use is generally part of the home rule process, or at least a locally determined process. So the role of EPA as a Federal Agency, in terms of land use decision making, is a little different; similarly with the FAA, in terms of what their responsibility is. Even though a conference for airport master planning has to address the issue of land use planning, the ultimate determination of the management of the land use plan does not rest with the FAA, but has to be implemented by local government.

Now, there are some interesting characteristics that can be constructed to insure that the money that is being spent around airports addresses the question directly, in terms of accountability. I think that is one of the biggest problems we have in terms of effective land use planning. No one is held accountable for the process of land use planning. There is an interesting test case underway now for professional liability. It may deal directly with decisions associated with environmental issues. Test cases now in California and Nevada suggest that professional opinion may have some inherent professional liability. Now maybe that is one of those roles that we must be a little more aware of in terms of making decisions that are accountable in terms of land use planning itself. An interesting concept -- it may be discussed during these next three days.

The interest in involvement, again, is to see what the direct involvement is and then what is the indirect involvement of these groups, and what I will do shortly is show you the matrix which, unfortunately -- by virtue of the size of the auditorium -- will not be able to be seen very well, but will be best seen through the book that we have. However, we have talked about the levels of party involvement, the level of actors in terms of

solutions. Those that are directly involved are the parties who serve in an advisory capacity, those directly involved with the party that has some economic stake to those involved with it, parties involved in an administrative or legislative or policy-formulation manner. That is one set of involvement. Then there is a set of indirect involvements where the party is participating in an advisory capacity, has no direct interest but is only involved in an advisory capacity.

Interestingly, when talking with a mortgage banker about our concern about airports, he related to me, "We are really not too concerned about the impact around the airport. All we are concerned about is getting mortgages approved and loaning money for mortgages." Well, in this particular case his perception, in this individual's perception, is that they have a very indirect involvement in terms of land use planning; they have a direct involvement in terms of economics, but there is no association between the lending of money for a mortgage and the potential impact that may be associated with the environment. And yet we know of larger banks who are involved in this. Chase Manhattan, in their environmental division, their mortgage banking group, now has a specialist reviewing mortgages in terms of environmental noise. So it depends on who you talk to and what their interests are.

The type of noise control measures are also put together in this matrix. What we will do is show you the concept and spend very little time at all trying to examine it. The main point is it is schematic in nature. This is a report that was prepared for EPA dealing with the issue of general aviation airports in eight southern states, which evaluated some 111 facilities from 1975 to 1977.

(Slide) This is the matrix. The important thing here is that you do have a series of players that are described here. These are coded to your book. Essentially, "A" at the top would deal with the public sector in terms of the Government. The ones across are measures that could be applied in terms of planning anyway, and the degree of involvement is shown there. D-1 through D-3 is a direct involvement, and I-1 through I-3 is an indirect involvement. What I suggest here is that at any airport in the country, whether you do it formally or informally, this type of matrix exists. What we have done as a professional society of planning groups, we have gone down one or two of these tracks and we made the letter "W" or the letter "V" and we haven't looked north or south or to the top of us or underneath us.

Now we are going down a single line of track or maybe two or three tracks, but we don't see the dynamics of these relationships with other groups. And just to make a point: HUD, in the proper approval of mortgages around airports and the policy of the private lending institutions in terms of mortgages around airports and the policy of the private lending institutions in terms of mortgages around airports are two different philosophies and they may not even know what each person's perspective is.

What this is attempting to do is to put it all onto one large map. Complex? Yes, it is -- but at the same time, its complexity can audibly resolve conflict if you at least know who is in the game. Many times, we play the game but we don't have the same rule book. One person is playing one way and you another; you are playing with a slow pitch, another person is playing the fast pitch; a case of one using a softball and one using a hard ball; one

person has three outs, the other person has four outs. We are not on the same wavelength.

So, that is what we are trying to do here these three days -- trying to get everybody together to see where we can interrelate and understand the dynamics of decisions.

This first one deals with the question of planning itself, at what points are planning and process decisions made. The second one deals with measures, what can you do and what type of implementation strategies can you get involved in. I had a very interesting experience working in a consulting capacity in Florida with the Chamber of Commerce in one of the larger communities. Historically, Chambers of Commerce from the private sector have shown very little direct interest in airport planning but that interest could be cultivated. In this particular situation, they took the environmental leadership in a large regional community in terms of getting resolutions so they could use the airport as a dynamic force in terms of industrial and economic development, rather than one of great conflict. So, the point here is that all groups are interested in some type of dynamics in terms of an airport issue. If you get the people involved -- whatever your role is, at least get the people around the table.

This last week I have been working with a group that I have never worked with, assessors. We will have one presentation from this group. It is an extremely unique group and very foreign to me, but in many ways the decisions of an assessor have a lot to do with the future form of a city; whether one area is to be an area of growth or decay, whether an area is going to be transitional from residential to non-residential uses. You can see very easily on an assessor's report who is very, very aware of the process of planning in a very formidable way. So from an economic standpoint, the real estate appraiser or the real estate assessor has a role and that person should be participating. At least, we should know the dynamics of where these people are coming from in terms of an ultimate resolution on airport issues. So, those are the formal comments.

I would just like to conclude with what is certainly a schematic. This may not fit any given location but at least it is an attempt. What we have done with this -- working with one of my Graduate Students, Jim Reese, who has helped prepare this -- we have thought this through in a given situation to see how it would work, but in no way would it work, obviously, in a collective way. But it may fit in a given situation by changing different blocks and so forth. At least, this is a think piece and I hope if we don't do anything else as a conference that we have a greater appreciation of the roles of different people in terms of where they are coming from in the decision process and how we may work together to have a mutual interest that can resolve a potential problem that could exist or may exist in the future.

At this time it is my pleasure to introduce John Wesler. I have known John for a long period of time and I have known him in a variety of capacities. One capacity, not in the program, is one which he previously had and was with the Department of Transportation. John now has two hats with FAA; he is Acting Associate Administrator of Policy and International Aviation Affairs and also Director of Environment and Energy for the FAA. I am pleased to introduce John Wesler.

MR. JOHN WESLER: Thank you, Cliff, very much. My role here this morning is really two-fold; one is to show that the FAA and the EPA do work together -- because I am here -- and secondly, as formally shown in the program, to provide some idea of the extent of general aviation and general aviation activities in the United States as a basis or textual arrangement for the subject of your three days of meetings here.

I also, while at the platform, would like to expound upon a couple of ideas which we at the FAA have regarding noise abatement, particularly in general aviation airports -- but I will do that in a minute.

In any discussion of general aviation it is probably a good idea first of all to define the term. General aviation is not strictly defined in any given place within the Federal Aviation Regulations which the FAA promulgates to fulfill its mission of regulating air commerce; promoting, encouraging and developing civil aeronautics; controlling the nation's air space and protecting the public health and welfare. There is no definition of general aviation, so in most of the work and the analysis which we do we consider general aviation to refer to all civil aircraft operating in the United States, except those that are operating under Parts 121 and 127 of the Federal Aviation Regulations.

Now, I will probably tell you a little more about this than you really want to know, but essentially in Part 121 and Part 127, we refer to air carrier operations, fixed wing or helicopters or rotorcraft types of airplanes. So in effect, insofar as we are concerned, general aviation does not only include the recreational type of small, propeller-driven airplanes which are most normally associated with general aviation, but also includes air-travel clubs, air taxis, commercial operators of the smaller aircraft, cargo carriers, and business-corporate jets, of course. For example, in 1977, our last good census of general aviation type aircraft, there were thirty 707-720 aircraft included among general aviation aircraft. There were twenty-seven DC8's, a hundred and ten DC9's, and fifty 727's. So general aviation has encroached and incorporates a wide variety of types of aircraft.

I think our interests here these three days are basically in the smaller aircraft and so I will try to address those and use those as illustrations from now on. By the way, the Federal Aviation Administration does publish a number of types of censuses for all kinds of aircraft, including general aviation. One of these, for example we just published this past April, has general aviation activity and avionic survey. This report is available in the public domain, certainly -- and annually we compile and publish aviation forecasts. We forecast aviation activity for 12 years into the future. For those of you not in the Federal Government, 12 years may sound like a rather weird period of time, but it allows us to do our budgeting for two years beyond that; hence, the 12-year kind of prediction. And by the way, this is the advance copy of the next forecast, which will be published at the end of this month.

As I mentioned, there are roughly 193,000 general aviation aircraft at present operating in the United States. This compares with something less than 3,000 of the larger air carrier type aircraft, so you see that the vast

majority of the aircraft are of the smaller G.A. type. These G.A. aircraft are flown by something like 800,000 active pilots. They fly something like 54 million recorded operations at airports with FAA towers, and there are only something like 490 airports with FAA towers so this woefully underestimates the number of operations by G.A. aircraft in this country.

By way of measure of sophistication of G.A. aircraft, of those 54 million operations, some 17 million of them are instrument operations which indicate that about 31% of those operations are done by aircraft with some sophisticated avionics equipment on board; they are not the simple Piper Cub out flying for a weekend of recreation.

General aviation has grown significantly over the past five years and it will continue to grow over the next 12 years, according to our forecast here. In 1991, for example, we forecast that there will be slightly over 300,000 general aviation type aircraft in this country. That is an annual increase of 3.9% in the number of aircraft alone in active use. There will be something over 1.1 million active pilots, piloting an aircraft -- once again, an annual percentage increase of about 2.8%. The hours flown will rise to something like 64 million during 1991. We forecast because we are interested in the workloads at our FAA facilities, and it is forecast that there will be some 76 million recorded operations at FAA-controlled airports. About 40% of those will be instrument operations, again reflecting the increased percentage of sophisticated general aircraft with sophisticated avionics aboard.

We also forecast that corporate business flying will constitute a growing proportion of G.A. activity but that purely recreational flying will form a decreasing proportion of G.A. activity, and the reason is quite obvious: the increasing cost of fuel is going to cut back somewhat the purely recreational flying but will probably have very little effect on corporate and business flying.

These statistics, as I mentioned, display only a portion of the G.A. activity in the country. The operations listed, as I mentioned, are only those that affect the FAA's workload; that is, those that have an FAA tower to handle it in terms of approaches, landings, takeoffs and advisories. At the beginning of this year there were 14,574 airports in the United States and of those only 1,730 handled air carrier operations, so the difference is something close to 14,000 that are purely G.A. airports, as we know them.

There are a large number of G.A. airports and, contrary to general opinion, the number is increasing and it has been forecast to increase. The number of airports is forecast to increase along with the aircraft themselves. Now the forecasted growth of G.A. activity portends some growing problems of the smaller G.A. airports. Just the sheer increase in number of takeoffs and landings will increase the potential number of noise events.

Added to the absolute growth of the activity in the G.A. airports is another factor. The potential danger of mixing operations of small and large air carrier aircraft at major hub airports was tragically illustrated a year ago last month at San Diego. As a part of its effort to improve air safety, particularly all air carrier safety, but air safety in general, the FAA has launched a program to improve what we call or refer to as "satellite" airports located around major hub airports across the country. We have announced a

\$100 million program over the next four years to improve the capabilities of approximately 85 airports located around 56 hub airports across the country. Their capabilities will attract general aviation and training operations away from major hub airports and to those smaller satellite airports. There will be more of this in the years to come. And so in addition to the sheer number of operations of G.A. airports, there will be additional operations as operations now being handled at major hub airports are attracted away from those major hub airports. This will be a program to improve G.A. satellite airports around those hubs, improve in the sense of better runways, strengthened runways, more apron and parking area, better electronic and avionic equipment for instrument landings and that sort of thing, for creative purposes and for safe operation.

The Federal policy regarding aviation noise abatement was stated in 1976, and I am sure you are all familiar with the aviation noise abatement policy statement that was issued jointly by the Secretary of Transportation and the Administrator of FAA back in 1976. Although that is almost three years old now, the principles stated in there are still valid and we still adhere to them. It is out-of-date in some respects. For example, the Airline Deregulation Act of last year has thrown some of the statements in there out the window, but most of the philosophy that is stated in our policy statement is still good.

For example, there is still a shared responsibility among all elements of the airport community for aviation noise abatement. The statement defines very clearly what the federal Government's role is. It defines that as the control of aircraft noise at the source, that is the airplane itself, the control of aircraft operations and management of the national air space with minimum economic impact and for the highest degree of safety. It provided funding to permit airport noise abatement projects, both planned and concrete projects, and the support and encouragement of research and development for noise abatement.

Now, we in FAA, naturally, feel that we have met those responsibilities insofar as we could. We have issued and are continuing to issue noise standards for most all types of aircraft, including small propeller-driven aircraft -- unless small propeller-driven aircraft are defined as those less than 12,500 pounds gross weight. A standard was issued in 1976 for new designs, effective then, and beginning next year those standards are applied to new production aircraft. So those aircraft produced beginning next year will be quieter than previously in production.

We have also proposed noise standards for helicopters this past July, so another type of aircraft will be covered in our noise regulation. We are continuing to look at the stringency of those standards to see if technology and economics will permit an increased stringency. We are meeting next week, as a matter of fact, with several working groups of the International Aviation Organization to address exactly this question, both on an international front, as far as those things are concerned, and as far as I am concerned on a national front. So we have, I believe, done our best to limit the noise at the source, the aircraft itself.

We do control operations at FAA-controlled airports to minimize noise as far as possible. This in itself is not a very easy thing, as I am sure

most of you know, because we may divert the departure tracks and arrival tracks to remove noise impact from one area of the community but somebody else is going to get it and the new area is not happy. Our role here was to try to make the least number of people unhappy because we are never going to satisfy everyone.

We do provide financing for airport projects and we have proposed new legislation under the Airport Community Development Program. Trust fund legislation expires next year, and we have proposed the continuation of that program to include additional eligible projects for noise abatement purposes; operating systems, for example; land acquisitions for noise abatement purposes; soundproofing of public buildings around airports -- and so we do provide Federal funding and financial assistance for noise abatement projects. And finally, we work closely with NASA and with industry itself in trying to develop better noise abatement technology insofar as possible.

But obviously, the Federal efforts here are not going to solve the noise problem and so the other elements of the airport community also have responsibilities. Among those shared responsibilities are the airport operators and state and local governments. This is largely what we are talking about here these three days, the state and local governments and the aircraft and airport operators themselves.

Although our subject here today is primarily land use planning, I would like to concentrate first on a couple of things which we suggest, and we recommend that airport proprietors could do to reduce the noise. Restricting land uses for noise incompatibility is an agonizing task, as all of you know. In many cases, it is an impossible task if the airport surroundings are already developed. Typically, as has already been said, land use planning is only feasible as a means of preventing further incompatible use and noise impacts, rather than correcting those which are already present. The less land that is affected, the easier is the case.

An airport proprietor is in an uncomfortable position. He finds himself legally responsible and financially responsible for damages which arise from the operation of his airport, and yet in many cases he sees that he has little responsibility or even authority over the noise conditions at these airports. He feels, generally, that the Federal Government has preempted control over the noise generator, the airplane itself, and over the manner in which the airplane is flown. So, what is left? Obviously, one of the things that is left is the control or restriction of the use of that airport, either in terms of hours of use or in terms of types of aircraft that may use his airport.

There have been curfews imposed at certain places which, in general, we think are quite appropriate, so long as the curfews are based on a real need for noise abatement and are imposed in a non-discriminatory manner. The usual second Constitutional test of undue burden on interstate and foreign commerce generally doesn't apply to G.A. airports, but the test of discrimination does. For example, in several cases across the country -- and Santa Monica has been a recent example of this -- use restrictions have been placed in the sense of a jet ban. Whereas, one type of aircraft has been banned from use of an airport because it is, quote, noisy, unquote, we feel -- and the Court agrees with us -- that that type of restriction for noise

purposes is illegal. There are some jet aircraft that are alot quieter than some propeller aircraft and that, therefore to restrict jet aircraft because they are, quote, noisy, unquote, is discriminatory. We have done tests to substantiate this and, as I mentioned, the initial Court findings in Santa Monica have upheld this position.

We feel, however, that there is a way to restrict aircraft at airports on the basis of noise. In support of this approach we have recently published our Advisory Circular Number 36-3, dated May 29th, 1979. For those of you who have not seen this, it is essentially a listing in order of noise level of all the aircraft for which we have valid data at the three FAR-36 measurement locations. Essentially, we have listed, in terms of maximum A-wave sound level, the noise levels of a wide variety of aircraft in descending order of noise level. These noise levels are based on standardized tests, following procedures defined in our standards, and they thus proved what we consider to be a viable and directly comparable and standardized set of noise values.

An airport operator may then, we feel, limit the use of his airport to aircraft that generate no more than a fixed noise level based on this standardized listing. And he has available to him, through our advisory circular, a non-arbitrary and, we think, a non-discriminatory basis for determining which type of aircraft should be restricted. The actual noise limit, of course, should depend upon the degree of noise protection that the airport needs and, of course, an airport operator will need to examine carefully just what restriction will do to the airport and the aircraft operators.

It is often tempting to install a microphone off the end of the runway and use direct measurements as a means of restricting aircraft. Aside from the technical complications and the expense of such an approach, we oppose such restrictions on the basis of safety. Pilots -- and especially some of the less-experienced pilots who may be using general aviation airports -- may be tempted to beat the box in such instances by flying in an unsafe or potentially unsafe manner in order to reduce the noise over the monitoring points. In addition, the constantly changing propagation and meterological conditions will cause the noise levels at a given point to change from day to day, even though the same aircraft is flown consistently in the same manner; thus, a pilot is never certain that he or she will meet the set, measured noise limit each time he or she flies that aircraft and may be tempted to alter the flight procedure just to be sure. We believe that the standardized noise levels that are presented in our Advisory Circular 36-3 provide a better means for restricting aircraft use at an airport rather than the use of monitoring single-event levels.

In summary, I have tried to say that general aviation activity is growing, as you know, and will continue to grow in the foreseeable future. Although individual noise levels of new-generation aircraft will become quieter as our noise standards become increasingly effective, the sheer volume of activity may cause additional problems at some airports. Land use controls and land use zoning are difficult to impose and represent, essentially, the last resort in airport noise abatement. We feel that there are constitutional and practical means for restricting airport use for noise control purposes.

MR. PETER Q. ESCHWEILER: Peter Eschweiler, Westchester County, New York. Could you go over again the distinction that you made on the use of your new Advisory Circular, between the previous practice of trying to discriminate against the jet operations because jets were noisy and the ability to discriminate against the noisier airplanes on your list? It is still discrimination, is it not? How are you going to get around that test?

MR. WESLER: Well, the discrimination is on the basis of the main thing which you are attacking, and that is noise. If the reason for restricting use of an airport is noise, then noise should be the basis on which the restriction is imposed. Now, we have essentially listed the noise levels under standardized, measured conditions of all kinds of aircraft, both propeller-driven and jets. To ban jet aircraft because they are jet aircraft is discriminatory. We have shown and we have data to prove that some jets are quieter than some props. To limit those jets because of noise is discriminatory.

We propose the use of the standardized tests rather than a local test or a local continuous measurement because they are literally standardized; they are directly comparable. If an aircraft is noisier on this listing, we feel it will be noisier in the field -- even though it may not be operated in exactly the way our standard test procedure is. It will be comparable on the basis for which the restriction is imposed, noise.

MR. WILLIAM J. CRITCHFIELD: Bill Critchfield, Torrance, California. You have described FAR-36 as somewhat a clinical evaluation of noise characteristics of aircraft. Our experience has been that in many cases the aircraft is extremely noisier than your standards would indicate when operating. My question is: does the FAA plan to improve on the standards for operators of the aircraft in anyway in terms of regulation or guidelines to flight standards?

MR. WESLER: Well, the first point is that our FAR-36 finds that noise levels are not representative of the noise levels actually used in the field. This is quite so. This is an inherent part of the standards. The standards are literally that, a standardized procedure, a standardized method for measuring the noise and the degree to which noise-making technology could be included in the aircraft. They are not necessarily representative of the way the aircraft is flown in service. It is quite so that aircraft may be noisier in the field, operating day to day, because of different operating procedures.

So far as controlling the operation of the aircraft themselves at the various airports, we attempt to do this through our air traffic control procedures. These procedures, in general, are advisory in nature; they are not mandatory because in the last resort it is the pilot himself who decides what is safe and when he should deviate from the advisory type of direction.

MR. CRITCHFIELD: This is why I was asking if you were going to do it through flight standards to, let us say, tighten up the standards for obtaining a pilot's license to fly these aircraft and including noise abatement techniques and procedures in the syllabus for flight training on the crew of FAA flight students.

MR. WESLER: To the best of my knowledge, they are, or should be if they are not. I know that our check pilots, for example, do emphasize noise abatement takeoffs for the air carrier pilots, at least, and for the commercial pilots. Perhaps this is not as stressed as it could be for general aviation or the everyday pilot. But you are right, that educational processes are needed. We have been attempting this and you are saying we have not been very successful.

MR. CRITCHFIELD: Well, we have been reasonably successful as a local proprietor. Unfortunately, I am having a little trouble with my local flight standards district offices.

MR. WESLER: Let me know.

MR. CRITCHFIELD: I will.

MR. WESLER: But I think this is a valid thing for an airport operator or proprietor to do. Education is not alone the FAA's job; it is everybody's, including airport proprietors.

MR. CRITCHFIELD: Our concern, as yours, is safety but I don't believe that safety is that big a problem from our experience.

MR. WESLER: Yes, sir?

MR. RICHARD W. PROCUNIER: Richard Procunier from San Francisco. I was going to ask just a quick question first. Do you have any idea the percentage of fuel that general aviation consumes compared to commercial aviation?

MR. WESLER: I don't have that data available.

MR. PROCUNIER: That would be interesting.

MR. WESLER: It is a very small percentage.

MR. PROCUNIER: It's a very small percentage.

ATTENDEE: If you compare it by a gallon, all aviation consumes about one tablespoon full per gallon of fuel consumed for all purposes in the United States.

MR. WESLER: That is quite so -- something like three-tenths of a percent.

MR. PROCUNIER: I want to talk a little bit about safety and particularly your concern about putting in a training facility which would not only impact noise but also safety in urban areas, moving them from urban areas and attracting them to outside areas. I think that is a very important situation. Not only the dramatic situation at San Diego but just in the regular, routine G.A. operation -- especially with low-experienced pilots -- the safety record is not all that great, and first-time or several-time pilots pose really a public health and welfare hazard in urban areas. You talk about improving the runways at these more remote locations, so I am wondering if

there is not a way we can also encourage that through either the training or availability of pilot instructors -- some active encouragement.

Also, I think the FAA could, in a way that the DOD does, calculate safety hazards around airports and in that way, when the local decision makers become aware of the hazards over their areas from civil aviation aircraft in training operations, we cut down the number of operations and thereby the noise impact and safety hazards in urban areas and encourage them to move to the more remote areas.

MR. WESLER: I agree with you, Dick. Training is an essential part of aviation; if we are ever going to improve the safety, obviously we need training. There are clear zone requirements for any runway under the FAA Regulations. Those clear zones are essentially safety-oriented and require a certain clearance, among which are the highest obstructions within a conical, if you will, or trapezoidal area approaching each runway.

MR. PROCUNIER: Actually, the way DOD does it, it puts numbers down -- you know, quantifies it. We have had requests in San Francisco for that kind of information and it just doesn't seem to be available.

MR. WESLER: No, I think certainly the Department of Defense has done a far better job in that than we have. I suspect there may be some feeling within the FAA of scaring off people because of airport potential danger. I think the illustration of Thurmon Munson from the Yankee baseball team recently represents the potential danger in the less-experienced aircraft pilot. I agree with what you say.

MR. PROCUNIER: Because of the economic impact -- the schools want to locate in the urban areas; that is where the customers are. So, I think we have to counter that by offering really active encouragement, not just improving the facility; really saying, "Look, you really want to be located out here where it is safe to fly over the population and there is less noise impact." Thank you.

MR. WESLER: I agree with you. Joe?

MR. JOSEPH R. LEWIS: I have a question on Federal funding. Right now Federal funding is dependent upon the airport operator requesting it. In other words, the community could not request Federal funding from the FAA to set up a number of monitoring stations around an airport. I am particularly referring to the awful situation at Kennedy, where the one monitor the Port Authority has at the end of only seven of the eight runways is really nothing. We would like to see about 22 monitors around the airport and we would like to see the FAA do this. But as I understand it now, the only one to request that would be the Port Authority, the operator of the airport, not -- let's say offhand -- the City of New York.

MR. WESLER: Well, Federal funding for that sort of thing is restricted to the airport sponsor, that is the operator of the airport. That is correct.

MR. LEWIS: Well, the point is: does it use just exclusively the economics of the situation and things like that -- which are really a

fallacy? I think it is something that should be looked into. The local government should be able to apply further for these things. I would like to point out something that possibly some people are not aware of. We talked about FAR-36 noise levels. The only time the airplane has to meet that is when it comes off the production line. That's it. Take the 747. The first time it came into Kennedy Airport it came over us at about 500 feet. We didn't know he was there until we looked up and saw him and we heard him later and I can tell you we can hear the 747 coming in there now. So the whole system is really all mixed up. It doesn't mean anything.

MR. WESLER: To contradict something which you said, it is not the test of the prototype or the first off the production line that is the only time that they are tested normally. That is correct for noise, but the quality assurance of all aircraft coming off the assembly line insures that technology is in that prototype.

MR. LEWIS: When you go for your driver's license, whoever is there can grant your license if you can drive at the sustained speed limits -- and I say it is the same thing with FAR-36.

DR. BRAGDON: Thank you, John. Our next speaker is Lucie Searle. Lucie is Community Liaison with the Massachusetts Aeronautics Commission in Boston. We are pleased to have her here today to speak to us on the issue of State perspectives on land use planning. Lucie Searle.

MS. LUCIE G. SEARLE: Thank you, I am delighted to be here as a participant in the Conference on General Airport Noise and Land Use Planning. It is a subject that is close to our hearts and our ears in Massachusetts, so I welcome this opportunity to be here today to share with you our thoughts -- which are from the perspective of one State.

When I was putting together my remarks for today, I ran across an article which I wanted to share a quote with you from because I thought it was pretty interesting. It is entitled: "Airplane, Stay Away From My Roof." The author writes, "You move out from the noise of the city and you pay a premium to be away from the railroad. You go to a lot of trouble and expense to get on a side street, away from the buses and trucks. So, what do you get? Right along with a big mortgage, neighbors, a mangy lawn and a leaking basement, you get planes. It turns out that your quiet residential street is a boardwalk for modern aviation, and the planes come over as if you had put suet out for them." This article appeared in a 1947 issue of Saturday Evening Post. It was cited at an earlier aviation conference that was sponsored by the National Aeronautic Association in 1947. It was used in a speech at that time, entitled: "Making Neighbors of Airports." Obviously, somewhere between then and now we have not followed a lot of the advice and a lot of solutions or I suspect we would not be here today.

We have a general aviation noise problem in Massachusetts that impacts not only airport neighbors, like the writer of this article, but also threatens the viability of several of our key suburban G.A. airports. Because of noise, we are having a great problem of carrying and maintaining what we already have. We have a problem of carrying runways and taxiways, not to mention extending or adding new runways. In fact, if you really want to have a showdown between airport and neighbors, try to put in an instrument landing

system -- I think this is quite irrational, but there is a great concern that it is going to generate more operations, which is going to lead to more noise.

I have to relate this to John Wesler's point about FAA efforts to improve reliever airports. In Massachusetts, our reliever airports do not want this kind of improvement because they are convinced it is going to generate more noise, so we do have a problem there.

The solutions to our noise problem today I suspect are just about the same ones which were identified in 1947; noise control at the source by manufacturing quieter aircraft, operating procedures, and land use controls. From the State perspective, I am going to review each of these with you and give you an idea of what our experience has been on each of these three elements. When I talk about our experience, I refer to a State system of 25 publicly owned airports and another 25 that are privately owned and open to the public.

We have, as you know, one major air carrier airport, that is in Boston, Logan, and all the rest of our airports are almost entirely general aviation. Some have a few air carrier operations but G.A. is the primary use. To try to pinpoint the problem, I have to say that our G.A. noise problem is concentrated on our Greater Boston Area where our most important G.A. airports are, where our most active ones are. The remainder do not have a problem now but we are working on a preventive basis with those.

To get to the first point, source control. This is primarily a Federal and industry responsibility. From a State viewpoint, we believe that a great deal remains to be done there, particularly with piston-engined propeller aircraft. These are the biggest users of our G.A. airports, whether it is for touch-and-go operations that are associated with flight training or whether it is with the business fleet. The prop aircraft are the biggest part of the business fleet and those are the biggest users of our G.A. airports.

Prop noise could be controlled by reducing propeller-tip speed and this can be done by a slower turning prop or a multi-bladed prop. From what I have been able to learn, we are already aware of a great deal of knowhow that goes back many years -- and additional research is going on right now on how to build a low-noise prop. This is being done by M.I.T. and NASA under a program that is being sponsored by the EPA. It seems to me that what is missing here is the incentive; partly because it is only in recent years that general aviation airport neighbors have started to flex their political muscles and also for the other part, because FAA's FAR-36 standards for light props present little or no challenge to the industry.

I have to disagree very strongly with my good friend, John Wesler. I don't think the FAA is doing its best. Since FAR-36 was established in 1969, the modest standards that were set for light props -- and here we are talking about props that were under 12,500 pounds -- these standards have not been amended to require more stringent noise levels. The result is that the vast majority of props in our fleet have for sometime met FAA's lenient standards. I should point this out. I want to give this example here because I think this is very important. The marketplace right now can do better than what the standards are and I want to give you a couple of examples.

Cessna has come out with a single engine, the 182Q. It makes 69.1 decibels at a 1,000-foot flyover. The FAA standards for this plane are 77.9. They are about eight (8) decibels higher than what the marketplace can already do. The Cessna-152 is 65 dBA on flyover. The FAA standards require 71.8. Piper comes out with a single engine that makes 68.8 at a 1,000-foot flyover, while the FAA only requires a 77.9. So the marketplace could already do better than the ones on the books. We are not even talking about technology, which I am arguing is there to permit us to do even better.

From the industry's point of view, one obstacle may be the enormous cost and complexity of FAA certification of even the slightest design change. This is a situation which, obviously, discourages innovation. And I also want to acknowledge that there are some manufacturers that are doing a good job here, as I have pointed out. The ones I am familiar with are Cessna and Piper and I think from what I can learn that they have made these gains primarily by lowering the RPM's with these single engine aircraft.

I was very pleased to see that Stan Green of GAMA is on the program and I think we will probably be learning a lot more from him on this. I am very anxious to hear what he has to say. At any rate, it is our opinion and our experience that the compelling case can be made for tightening these standards, particularly when we remember that the prop fleet does not turn over very quickly. Some props are with us for a long time.

There is what I call a back door approach to dealing with this Federal regulatory inertia, which my own Commission has refused to sanction so far, partly because of the chaos that we think would result from airport to airport and State-to-State, and also because my Commission does not want to be regarded as a State with an anti-business image -- which we hear is suspected by many. This back door approach is the setting of maximum aircraft noise standards by the airport proprietor. Now, if I understood John Wesler correctly, he is promoting this approach. How does a proprietor set his own standard? Let me give you an example of an experience we have just gone through in Massachusetts.

One of our key G.A. airports in the Greater Boston Area proposed to set a noise level that was more stringent than FAR-36, but for several reasons my Commission turned the proposal down. The point I want to make is that we would like to tie our statewide source control policy to a national noise standard such as FAR-36, but it becomes increasingly hard to do this when the FAA's present standards for light props are so weak. Now enough about props.

The effort to quiet the business jet fleet is, in my opinion, another story and a much better one. Here I believe we have been more successful. The design standards first set by the FAA in 1969 were tightened in 1977 and have a production cutoff date for older, noisy models that was set in 1975. There is hardly an airport neighbor in my State that cannot tell you about the Cessna Citation. The quietness of this plane is appreciated and very recognized. There are others that have similar impressive noise records -- and here I think of the Falcon 10, the Westwind and the newer Lear jets. We have documented at one of our G.A. airports that over 40% of the business jet fleet is made up of these quieter, smaller, turbo jets like the Citation. And it wouldn't surprise me to learn that many of our other airports -- I do not have the figures, but it would not surprise me to learn that their business

jet fleets are becoming composed more and more of these quieter planes. The point is that the FAA standards have been tighter here and that technology and the marketplace have responded.

The operating procedures is the second of the three-part solution. This involves designing site specific measures that address an airport's particular noise problems. In Massachusetts, the kind of things that we have used have included prescribed flight paths, preferential runways, requirements that touch-and-go airplanes be airborne in the first half of the runway, time of day and seasonal restrictions for touch-and-go operations, and designated areas for runups. We have found the most effective results come after we have a participatory effort that involves airport neighbors and users as well as responsible Federal, State and local officials. Operating particularly if some non-residential areas still exist over which aircraft can be diverted. Also, I think operating procedures often offer the only tangible relief that airport areas can feel right now.

When I think about operating procedures at our G.A. airports, I cannot help but single out the National Business Aircraft Association, NBAA, which has been a leader in developing procedures and spreading the noise abatement message among its members, and I think they deserve to be recognized for this.

One final point on procedures that we have found, and that is to get the most out of our procedures we believe we need more help from the FAA tower controllers at those airports that have towers. We know that they cannot enforce our local rules, but we think we can use much more help from them in reminding and informing pilots of what is in effect at that local airport.

Land use is the third of the noise abatement trio that I have identified. It is the most critical and challenging task of all. It is undoubtedly a local and State responsibility; although I think there is a Federal role, primarily in the financial area. Here are some observations and highlights, based on our experiences:

In our State, and I suspect this is true in many others, land use is a very closely guarded local function. A large part of this, I suspect, is because of property tax implications. Our one effort in 1976 to enact State legislation that would have required local governments to exercise land use controls near airports was unsuccessful. It was very controversial, primarily because the local powers and the localities felt they were being threatened. The problem, of course, is compounded by the fact that you need land use planning not only on the part of the municipality that owns an airport or in which the airports are located but also on the part of abutting communities.

We have in Massachusetts the classic story of what not to do. One of our more important Boston-suburban G.A. airports, Beverly Airport, is located about 35 miles north of Boston and is owned by the City of Beverly. A very small part of it is found in the Town of Danvers and abuts a third community, the Town of Wenham. When the airport was sited back in the 1940's it was totally undeveloped land around the airport. In the very late 60's a developer purchased a large farm in the Town of Danvers and put in several hundred homes. Some of these are less than 400 feet off the end of the

largest runway. The situation is a no-win one for the people who have had noise abatement restrictions imposed on them.

What are we doing on the State level to try to prevent this from happening? Basically, four things: providing technical assistance, promoting airports as economic and transportation assets -- what I call "jawboning and moral suasion" -- and involving recruits in the cause. On the first one, providing technical assistance, this is a large part of my job. It means working with local planning boards and seeing if there are things that can be done by us on a site-specific basis. Can we buy land? Can we rezone a parcel from residential to industrial or commercial-owned space; subdivision control, permits, notice to prospective residents that there is an airport nearby?

Because I have spent so much time going around and needed to have a laundry list, I have put together what we call the Guide to Compatible Land Use Planning Near Airports in Massachusetts. This is kind of a soup-to-nuts cookbook that lists all of the kinds of strategies and ideas that we could come up with. I would love to have people here take a look at it and give me suggestions for improving it.

The second point: remind the communities of the economic and transportation value of their airports. Somewhere between the early days of aviation when a municipality was willing to give its eye teeth for an airport and today's no-growth, environmental philosophy, many of our cities and towns in Massachusetts have forgotten or they have lost sight of the value of their airports. I am convinced that my job would be a lot easier as far as persuading the planning boards that they ought to rezone a certain parcel to prevent residential development, I am convinced that it would be an easier task if they saw some direct relation between their role of protecting the airport and the airport's contribution economically to that city or town.

Most of our G.A. airports in Massachusetts just about break even. They do not directly enrich the local coffers, and in most cases there is a good deal of tax-exempt land that is tied up. So all of this makes it difficult to quantify the value of our G.A. airports.

What are we trying to do about this? We have been pointing to airports as generators of jobs, both on the airport and as a way of attracting industry to the area. We have been doing this through papers, through articles, through talks. We have also been recommending that when airport master plans are done, the master planners or consultants be required to talk about the airport's economic role, both now and in the future. I brought with me an article that I prepared for an industry magazine, talking about corporate flying in Massachusetts. This is an example of how we are trying to show some relationship between the need for land use planning to protect the airports and the economic contribution that they make.

The third, what I call jaw-boning and moral suasion, I think can best be illustrated by an example. About three years ago, the City of Worcester announced plans to build an industrial park near their airport and this is something that we applauded very much. As a part of this plan, they were going to run a very sophisticated, limited-access highway up to the airport and this would permit the industrial park to get built because the whole area is land-locked. As soon as the plan was announced, an abutting land owner

realized that his property became immensely more valuable and he proposed to put in almost 500 homes on a 130 acre parcel that he owned.

This was entirely a local matter. The State of Massachusetts had no legal authority there but we used what I call jaw-boning, moral suasion. From the State Secretary of Transportation on down, we pointed out all the reasons why this was a very bad thing to do, on the inconsistency of promoting industrial development on one side of your airport and permitting homes on the other. A local pilot's group applied pressure. We carted it through the A-95 review process. At the time, I was fairly new at my job and I was really determined that this thing should not fall through the cracks. I even called in Bob Miller from Bolt, Beranek & Newman, who was doing noise consultant work with us at that time, to help make a case as to why this should not happen.

It just so happened that Congress has recently renewed ADAP in 1976 to permit up to 90% Federal funding to acquire land or interest therein to promote noise compatibility. We went ahead and prepared a grant application for the City of Worcester and I rushed around telling the City mothers and the City fathers that I was sure we would be able to get Federal funding for them for this project. Well, it turned out we did not -- and I will explain that a little later. However, the City went ahead with their own money and, much to their credit, spent the \$160,000 to buy 130 acres. I am told that thanks to my repeated assurances that I could get them Federal money, this parcel has been unofficially named the Lucie Searle Memorial Park.

On the fourth tack, involving recruits, this is my way of saying that at least in Massachusetts we have to do a better job of getting help from people who know more about land use than we do. My staff at the Aeronautics Commission is made up of primarily engineers and pilots, which is fine from the aviation point of view but it does mean, when we come to land use planning, we do not have all the expertise we need, and we need to get some help. There are a couple of things we are trying to do on this score. One is -- and I suspect this is true in many States -- that we have these regional planning agencies. Our State is divided up into regional planning authorities. In the past, they have been primarily highway oriented. We are trying very much to get them to do aviation planning because our airports are regional facilities, they are not municipal facilities and when you talk about land use you need to approach it as a regional problem.

There has been a bill before Congress -- it may be in the ADAP Bill, I am not sure -- but there is a bill that would provide money for these regional planning agencies to hire aviation planners so that we could correct some of this highway imbalance that we have had in the past. The second example I can give you makes me go back to my story about Beverly Airport, which is located in the midst of three communities.

Recently, the regional planning agency for Beverly, which is the Greater Boston Regional Planning Agency, took on a joint study at the request of these three communities and they wanted a study of the area where the three communities come together, which is right around the airport. They have come out with this study just in time for me to bring it with me. I am going to show it to you because it is the first time we have had a regional planning agency get involved with one of our airports on the land use question. They have come out with a good plan and they have come out with all their

recommendations. On the other side, we don't necessarily agree with all of the recommendations but the point is here that it was the first time they have ever met with an airport commission, so we are trying to make some strides there. As I said earlier, land use controls are, undoubtedly, a local and State responsibility, but I also alluded to a Federal role.

To tell you what I have in mind here, I will have to go back to my Worcester story. I explained that we were trying to get 90% Federal funding under ADAP for Worcester; however, what happened is when the FAA Regulations came out it was pretty clear that Worcester would not qualify because the noise levels there were not high enough for the FAA guidelines to apply.

Now, Worcester is an air carrier airport. They have only two operations a day by Delta. Almost all of their operations are general aviation. I use it as an example because it is very similar to our other G.A. airports where we didn't have a noise problem. Now, we had a lot of land that we could buy but by the Federal standards this airport was simply not eligible. This would be true of all our G.A. airports under these existing guidelines, so you have kind of a "Catch 22" situation. Again, on a national level, this is the third year that Congress has considered Federal noise legislation and each bill has contained a provision for land use compatibility planning, but the bills apply only to air carrier airports.

We, in Massachusetts, every time we have given testimony on these noise bills, have said why don't you include G.A. airports; at least include the 11 commuter airports. Now, it is not my intention to be critical of the FAA or Congress on this score because I realize it would be impossible to fund all of the land use requests that you would get. Noise is noise and it is understandable that FAA guidelines would favor the noisier airports. My point is that this usually leaves out the G.A. airports.

It seems to me that there is one way, possible, to get out of this bind; that is to make block grants to the States. There is reason to be optimistic here because the ADAP bills, the bills to renew the Airport Development Aid Program that are before Congress -- there are three of them. One is a proposal of Senator Howard Cannon of Nevada: one is the proposal of the Administration, and the third does not yet have a sponsor but has been carefully thought out by the National Association of State Aviation Officials. These ADAP renewal proposals call for block grants to the States. It seems to me if we could get this, this would be some funding we could use on the land use planning for our G.A. airports.

In one other area where I could see how the Federal Government could make life easier for all of us is by eliminating the alphabet soup we have to deal with when we try to designate a measurement -- a system for measuring noise and another system for measuring impact on so on and so forth -- and designate one system for measuring noise and describing its impact. I wish we could just get on with it because it is terribly confusing.

I have concentrated on the land use part of the three solutions partly because I think it is the most difficult task and partly because it makes up half the title of this conference, as I think it should.

So to recap what I have said: yes, we do have a noise problem in our G.A. airports in Massachusetts and primarily at the most important, active ones where we have got a real problem now. There are also lesser active ones where we are at the preventive point. I think the solutions are well known; they have been around for some time. It all boils down to source control, which is legally an industry problem and a Federal responsibility. We need to make better use of the technology we have. Standards for light props must be tightened.

The second, operating procedures. These can provide meaningful noise relief to our airports now and are site specific. The only exception here are the NBAA procedures which are based on power management and those are appropriate at any airport. Our major task on procedures is spreading the word among pilots and getting them to follow the procedures. The aviation press has helped here and I would like to single out, particularly, Business and Commercial Aviation, which has a noise column covering a different airport every month. Very useful! We could, of course, use more help from our FAA tower controllers.

Land use control requires action from local governments. Thus far, this has been the weakest link in the chain. We in Massachusetts have been unsuccessful. I would urge other States to very seriously consider legislation which would give them clout in this area, which is a local matter. I see friends of mine here from Maryland and also from the State of California. They are the only two States that I know of that have been successful in getting a noise bill through their legislatures. I hope that we will have a chance to hear from them at some point on this score.

And the third point -- and I made this earlier -- was that our ability to purchase land near our G.A. airports would be improved if our chances of getting Federal money to do the job were better. I think the way out of this is to urge more block grants to the States in the Area of ADAP.

These are what we see as solutions from the perspective of the State of Massachusetts, and what needs to be done to apply these solutions. I am looking forward to hearing from the rest of the people on this program in the next two and a half days because I think there is a chance to get much more specific about the general points that I have made. Thank you very much.

MR. JAMES K. THOMPSON: Jim Thompson, Consultant for Operations Research, Inc. You stated that your main noise problems are in the areas where there are a lot of people and that the other airports don't seem to have the problem. Is it possible that the airports out in the boondocks have no problems because they only affect two or three families, and two or three families either do not know know or --

MS. SEARLE: Sure, I think it is two things: they are not as active, most of them probably have under 100,000 operations a year, and: secondly, they don't have the residential development around them.

MR. THOMPSON: So knowing whether there is or is not a problem in the rural areas is really technical; is it not? You have to know what the noise exposure is and where people are; that is, each one is a specific, technical problem.

MS. SEARLE: I think it is, but I think a lot of times we make it more technical than we really have to. A lot of it is common sense.

MR. THOMPSON: You couldn't get at it from numbers of people?

MS. SEARLE: No, I don't think you could. At one of the airports I spend the most time dealing with, the noise level is not any greater than the ambient noise level. The ambient noise level in the Town of Norwood is between 50 and 55 Ldn, and off the airport boundaries the noise level generated by the airport is not any greater than that but we have a terrible community problem. Part of it is single-event noise where you have an occasional business jet or occasional noisy prop.

MR. JOHN M. TYLER: I have several comments and I don't think I will take up them all. Mostly, I agree with what you have said.

MS. SEARLE: Thank you.

MR. TYLER: What I would like to mention is more or less reinforcing your comments. You mentioned that people oppose ILS's on general aviation airports. It has been my experience that when an ILS is proposed for an airport there is an environmental impact statement made which invariably says that after the ILS has been installed the noise will be reduced below what it was before the ILS was installed. This is a standard routine.

MS. SEARLE: Because of less missed approaches and that sort of thing.

MR. TYLER: Yes, and the people who buy the ILS know perfectly well the reason for putting the ILS in is because they would like to increase the traffic and they know that aircraft are more likely to be based there if there is an ILS system which allows them to operate under all weather conditions. So this is merely one step in the process of increasing the operations at the airport. Therefore, people oppose the environmental impact statement on the basis that they know they are being deluded by this information with regard to the real purpose of the ILS. We all agree that improved safety is highly desirable but we would like to have people, our airports in particular, explain honestly what the plans are. You can read in the terminal area forecast that this particular airport is expected to double its operation in a certain number of years and they are saying it's going to be reduced.

ATTENDEE: I don't agree with the gentleman's statement.

MS. SEARLE: I will say that we have gone back and forth with this and our Regional FAA Office can cite a number of airports where they put ILS on and the traffic is not changed, the number of operations. That may be a function of the location of the airport.

MR. TYLER: This could well be.

MS. SEARLE: I think you express the airport neighbors' point of view very well and I think I pointed out another side of it, so it is good for everyone to hear both sides.

AFTERNOON SESSION

October 3, 1979

1:30 o'clock, p.m.

DR. CLIFFORD BRAGDON: If we can get seated, please, we will start this afternoon's session.

I am pleased to introduce the next speaker, the first one of the afternoon -- Bob Doyle. Bob Doyle is a partner in Peat, Marwick & Mitchell, located in the San Francisco Bay area. He is an alumnus of Georgia Tech -- which I am pleased about -- in the area of Urban Planning. His presentation this afternoon is going to be on general aviation activity and land use planning.

MR. ROBERT DOYLE: Thank you, Cliff. As a long-time student in my twenties and then as a university-level instructor for several years, I discovered very quickly that the worst hour you could have for anything is right after lunch; it is a time when students prop their chairs back and go to sleep and the professor wishes he could. I am going to try to make this as interesting, hopefully, as possible -- and every now and then maybe shout and wake up a few folks and keep your interest with us.

I am going to give you a little secret. I am going to expose a couple of myths that we have found -- we, being Peat, Marwick & Mitchell -- in some 30 to 40 years of airport planning that will put me with one foot in each canoe; that is, of those who do not like airports and those who do like airports or the aviation interests. They are myths that we find constantly being repeated. I even heard a few of them this morning. Hopefully, that will make it a little more lively when we get into discussion.

I do not need to talk about a lot of things that I had in my notes that were already discussed this morning, but I would like to highlight a few of those.

General aviation activity, let us take that term; it is growing in numbers of intensity and sophistication -- John Wesler gave us a good run-through of that -- the sophistication coming in higher-powered aircraft, requiring more sophisticated navigation and so forth. Deregulation has pointed up the need for reliever airports in the metropolitan areas. That need was there before; deregulation has pinpointed it. The San Diego air crash, I think, has stirred people to action, whereas the problem has been there for a long time -- not only in San Diego, but also elsewhere.

We find in doing a lot of noise study related to airports and environment plans concerning the airport and its impact on the community that we are having to spend a lot of time with how you deal with single-event problems in contrast to overall noise exposure. Now, the single events are reflected in the overall noise exposure patterns but we are finding, particularly at some of the smaller airports, that we having to deal, most of our time, with what can be done on-airport and off-airport with respect to

single-event activities. All of this boils down to the fact that this is a very timely conference. General aviation activity is coming under closer scrutiny and I think that it is high time.

We are going to talk today, as much as we can, about the land use considerations that relate to airports, but I think we need to set the stage for that. You heard this morning about the growing aircraft fleet. You heard about the growing aircraft flying hours. You heard about how many airports we have in the country, something like 14,000 and maybe half of them are public. That is kind of an interesting number, that half of them are public. We will come back to that in a minute. I think what you have not heard yet is that general aviation activity takes place at many places other than general aviation airports. In fact, much general aviation activity is associated with air carrier airports; thus, the noise of general aviation activity at those airports is folded into the noise studies and sometimes obscured.

More and more we are finding that airport clients, the community itself, are asking us the acoustical experts to pull out what is the contribution of general aviation activity to the overall noise pattern. As I think was mentioned this morning, very often if you look at a general aviation airport's noise patterns, whether you are using Ldn or NEF or whatever, you have a hard time getting the so-called critical areas off of the airport property. That does not mean there is not a problem, as we have also heard this morning and as we are all well aware. It means that overall noise exposure techniques do not necessarily properly and clearly reflect the magnitude or details of that problem to those who wish to know about it.

We find, for example, that there are some airports which are general aviation only, a lot of them; but in other cases there is a high general aviation activity and a low air carrier activity at airports that are somewhat surprising. At Oakland, for example, 90% of its activities are general aviation, and the reverse is true of the major, so-called large hub carriers. As they get larger and larger in activity the general aviation activity tends to decrease. At Atlanta, for example, G.A. is about 10%, and we find that most of the large hub airports that have settled down after a while and carry a lot of activity, that G.A. represents about ten percent, in that range. And that is of a more sophisticated, jet, commercial-like aircraft.

Another thing we have not talked about is location of the facilities. We found general aviation airports, if you will, but certainly aviation activities taking place in urban settings. At the San Jose Airport in California, 87% of the activity is general aviation and it is located about eight blocks from the downtown and the tallest structures in town. It is an urban airport. It is not a suburban airport, even though San Jose is called often a suburban airport for Los Angeles North and what have you.

The suburban airport -- we have a number of those that have been alluded to this morning. I will not go into that. There are such things also as rural airports and I think it was referred to again this morning that the intrusion of aircraft noise in a rural setting is more of a problem than it would be, say, in a comparable urban setting. A few months ago, I saw on television a noise readout display in downtown Tokyo that consistently ran over 80 dB on the A scale. That's downtown Tokyo. So, if you put an airport into a highly noise-oriented setting you are going to have one reaction,

compared to putting it in a rural setting. Finally, there are remote airports and they cause interesting land use problems and interesting land use considerations -- remote in the sense that they may be strips -- and you get into some very, very touchy environmental clashes often on those kinds of airports.

Some of the key trends that I think we need to talk about -- we have heard some of them. By 1990, ten years from now, we are going to have two-thirds more aircraft. We are going to have three-quarters more aircraft hours flown. This is in general aviation. However, according to the AOPA, Aircraft Owners and Pilots Association, we have had a net loss of 39 public-use airports per year for each of the last 10 years. Now we are not gaining airports, yet we are gaining activity. And, John, I will want to quarrel with you a little bit later on about how many new airports we can really get, realistically. That is a useful and desirable goal but a very difficult one to accomplish.

It is clear that there is a vital need for more G.A. airport facilities in metropolitan areas but there is a persistent inability to get new sites approved due to several factors; environmental concerns, high land costs, and often -- interestingly enough -- institutional or management problems. I attended an FAA forecast session in Seattle which went on for a full day. Two-thirds of that meeting addressed how in the world they could get a new G.A. airport on the east side of Seattle. At the end of the day, it was very frustrating to everyone who was there because no one wanted that bill.

I am sure you have heard that old joke about the football team that was getting clobbered by about eighty to nothing, and the only player they had who could do anything was a fellow named Leroy. Leroy would get the ball and he would make a couple of yards and he would get smashed. That was going on all day long, and finally the team was giving Leroy a rest. He was in the backfield, and the home crowd behind in the grandstand said, "We want Leroy, we want Leroy." Finally, the quarterback stopped the game and hollered back to the crowd, "Leroy don't want the ball no more." That is exactly what we found in Seattle; no one wanted that hot potato. The Port of Seattle did not want it; the State did not want it, the County did not want it, the City did not want it; the Legislature did not want it, had no heart for special district legislation on it -- et cetera, et cetera -- the complications of new airports that are in the metropolitan areas.

On the environmental factors that we have talked about, a little bit on noise. John mentioned that Circular 36-3, and I picked just a few numbers out of there. General aviation aircraft -- and not counting some of the big fellows that John was talking about -- from that table, as I got it, on takeoff range from a low of 51 decibels -- remember, that is estimated on an A-scale in that circular -- 51 decibels on takeoff up to 99.1 decibels for a Lockheed Jetstar. So over a long range, in terms of takeoff, this compared to air carrier loads of 99.7 for a DC-10 and up to --not counting the Concorde -- up to 105.7 for a few versions of aircraft. So say 99.7 to 106 is your range then. In general aviation aircraft you are dealing with some equipment that is pretty high on approach. According to that table, it ranged on the G.A. side from 58 for a Cessna-150 up to 110 for the same Jetstar. Air carriers went from a low of 85 up to a high of 108 almost -- this was for a 707. So,

you cannot really say that general aviation aircraft does not make noise; it makes noise. It is perceived and displayed differently perhaps than air carrier noise.

I would like to talk a little bit about the safety factor. Now, we are talking about aircraft noise but I have found that you cannot get the safety process separated from the noise process. There are apparently some very good reasons for those, in listening around the country. There are psychological considerations by many people that relate to the aircraft flyovers or the aircraft operations. To quote a recent acoustical consultants' report, the extent to which an individual fears physical harm from the source of the noise will affect that person's attitude toward that noise. Now you might say, how do we deal with that; what are the results of that? Let me tell you the Hawaii story. Hawaii has been trying to get a general aviation reliever airport for the last 17 years for the State of Oahu. They have had the money; money was never a problem. The FAA has supported it all the way and was willing to give whatever money necessary. They went through several site selections, in many cases before NEPA, and met the environmental impact report requirements. They were turned down because of safety fears on part of both native Hawaiian Islanders as well as people who came over from the mainland. And these were airport sites which were essentially in the middle of a pineapple or sugarcane field with few houses around them. Nevertheless, the opposition was strong enough to stop the building of those airports which in themselves were a safety solution. The San Diego thing started it up again, as it has in many places, and now, interestingly enough, the best thing the State has going for it is the pilots have given Honolulu International a black star and that is pushing some action toward the reliever airport again.

Again, a lot of it has been psychological but some of it has been the usual things. Some of the aircraft owners did not want to drive 20 miles out to the middle of Oahu; it was closer to Honolulu International. The environmental interests wanted no airports because that meant more growth, at least from their perspective.

There are certain other environmental concerns I would like to at least touch on: the touch-and-go training operations that have been mentioned. The repetitive nature of this G.A. activity may cause problems or distress, particularly when it happens down in Monterey, California, which is a resort community and it occurs on Saturday and Sunday morning -- and everybody raises Cain about it. It is not so much the noise, it is the repetitive nature of the operations. I think they have restrictions where those are not even permitted now, and apparently they are being upheld, on weekends.

The growth-inducing aspects of an airport, new or expanded, often get everyone worked up quite substantially. Now it depends again on your perspective. The growth-inducing aspects may generate opposition instead of support for the venture, and I find as a very interesting thing that there are what I call an inclined plane of environmental concerns around the country. What is an environmental problem say in California or Florida or Oregon is not necessarily an environmental problem in Missouri or Kansas or other midwestern or southwestern States which apparently have and feel that they have more land and are not as concerned about the environmental implications. This is important in trying to structure the kind of study or plan that you are trying to develop.

In working on the Kansas City project, we were puzzled about the very, very prodevelopment attitude of the planning department, city management, city officials and all until we found out -- and I think Cliff Bragdon mentioned this somewhat this morning -- that 60% of the funds of Kansas City come from an earnings tax, not from the property tax. It is therefore to everyone's interest, including the property owners, to promote development to all the cornfields surrounding the Kansas City International Airport. There is an industrial park located here. The signs have been there 10 years, ever since the airport was built. So now, somebody comes along and says I would like to put an industrial park or my plant here and the guy says fine. He has not been paying much in the way of taxes through the years; the zoning has been favorable from his standpoint, and as a consequence it is a very prodevelopment oriented situation in contrast to many of the other situations that we find where it is just the reverse. Any improvement has got to necessarily be bad; this we learned in several places.

I would like to point out that there are changing community priorities concerning financing. First of all, most general aviation airports have a very difficult, if not impossible, way of paying their own way; they certainly don't do it. They have to be, for the most part, subsidized. Those subsidies have to come from some source because they will not come from the landing fees or the lease arrangements, so you come back to the city councils or the county board as such.

Community priorities have changed. Ten years ago an airport was a community status symbol; it is not necessarily that anymore. There are other things that communities are interested in so it is not as high on that priority list for either support or for financing. To many people in communities, as I have heard expressed and I am sure most of you have heard it, the airport and its related aircraft activity is often viewed as being of value to only a small group and of little or no value to the majority; therefore, if you have to have bond issues and financial decisions it is hard to get support for that because of that attitude, right or wrong. And a minor problem, there is a growing case list of general aviation controversies centering around pesticide operations relative to air quality and water quality.

Finally, there is the location of airport facilities in environmental areas which might be extremely sensitive. Here, I am thinking of Lake Tahoe where most of the air travel in the area is general aviation type, Lockheed Jetstars and so forth. There is a major battle going on over Lake Tahoe because it is supposedly a pristine environment and it is one that a lot of people have an interest in protecting. Also, I recently read where the Department of Interior will not let the Jackson Hole Airport be expanded any further -- which is in the National Forest Area in that area -- again for many of the same reasons.

Let us go to some of the land use considerations that we find. First, land use decisions or land use considerations may have a regional as well as a local policy context concerning how or what matters are important and what planning procedures are. I was the director of a regional planning agency that had to do with the Cape Kennedy expansion in the '60's, so I am not sure that I would agree with the lady from Massachusetts that the regional

planning agencies are the way to go. I would almost go the other way. I would say that unless those regional planning agencies have some real teeth in them to do something, then they are not the way to go. I have done them myself and did not get much action. I can guarantee you that most of the interests will look at the studies, participate by going to the meetings and ignore them, go their way -- whether we are talking about community interests, institutional interests or airport interests. That is a harsh thing to say maybe, particularly by one who is an urban planner and has been a regional planner, but I have no faith in them unless you have an organization that does have some real teeth in it. And I believe you will be hearing from the Minneapolis people where there has been legislation passed through the State Legislature for regional control.

But if you are going that way and if you do not couple the control with the planning, it is not going to make a whole lot of difference. It might produce some information and so will not be totally wasted, but I don't think it will be as big and beneficial as we all might hope.

Now, for the delineation of airport impact, how general aviation impacts from a noise standpoint, especially at air carrier airports, we use the overall exposure pattern, the NEF or Ldn version, and that works pretty well at outer limits. Well, suppose you do not have the jurisdictions and so forth but you have to work it by figuring out what is the impact area, what neighbors might be included and what might not? Secondly, along delineating the airport impact area, Cliff mentioned the preventive or remedial processes. On some airports, new ones or relatively new ones, preventive measures or actions can be taken on the land use side as an effective means of dealing with the noise impact. Then on existing airports that means you look to remedial means for correction, operational or even runway reconfiguration schemes to handle that type of thing or prohibitions against certain activities at certain times. So you have different measures that must be applied to the corrective remedial situation versus the preventive situation. Now, I would say that an awful lot of airports have both to deal with. They have a corrective situation that they need to get straightened out and they have a preventive situation to deal with, but you have to look at those from those standpoints.

I think it is pretty obvious in terms of a land use pattern -- but it is obvious and acceptable to everybody -- that if you had an agricultural pattern around an airport it would work pretty well from the standpoint of noise exposure, and you try to get that. But agriculture is often dependent, particularly commercial agriculture, upon changing market and union conditions. Again, Hawaii -- pineapple and sugarcane are going out. It is too costly to have local workers on those plantations and they are moving that to the Far East. That means agriculture, just by and of itself, may not be enough to protect those airports. Even agricultural reservations like we have in California and several other states are not necessarily good enough, but it is a good start.

Recreational use of certain types -- obviously, we have all seen golf courses and they seem to be acceptable. Although, Dudley Hines was telling me about a lady in Miami who was objecting to a noise situation on her golf

course near the Miami International Airport because it would bother the golfers when they were on the tee, trying to drive down the fairway, and she made a big case of this.

Low density industrial use -- you do not get that use out that far, particularly in areas where you might have either a noise or safety problem.

Finally, low density residential -- now, I know that will be a little controversial. Let me tell you the story of the Fairfax County-Dulles Airport. That area has some aviation activity and in fact is growing and is looking to fill northern Virginia's general aviation needs. Dulles Airport went out there 15 years ago. Loudoun County and Fairfax County, Virginia, between their various plans and zoning ordinances, have reserved about 20,000 acres of industrial land around Dulles International. We would applaud that as the way to go, that is what the local planners ought to be doing. Unfortunately, there have been about 300 acres developed in the 15 years since the airport has been out there. And the same story applies to the Kansas City International Airport, which is 15 miles out and has had the same reaction. The problem is that there is no market for the kinds of industrial activities or commercial activities that need a lot of space, a good amount of land space.

Washington, D.C. is a paper place; printers do very well there. Even government employment centers have a lot of people but they do not use much space. So, okay -- where are the planners on this? Well, they are being sued or they are being threatened with suit. The land is rocky and no good for agricultural purposes, no market for industrial purposes, so the only market is -- guess what? -- residential. So they are fighting the battle now; doing some very effective things in trying to get as low a residential density as they can in there through the subdivision approval process and through the real estate transfer process. I think they are doing probably as well as anyone could with that kind of a problem.

I am just pointing out that it is not a fantasy, saying to put industrial zoning around the airports, and when you do put the industrial zoning around the airport areas you might get nailed.

We have said that the planning process needs to provide adequate citizen and airport user involvement. I could not agree more. In Seattle, 3,000 people participated directly in a very effective program that turned everything around from a very negative situation, both on the part of the airport and the community, to a very positive one. Let me say here that some of the needs relating to the planning process are attitudinal needs and do not apply to anybody and everybody but do apply to many in many, many places across the country. There needs to be a more concerned attitude by airport management and interest about the problem. Some managements feel like: let's not get off the reservation because there are Indians out there and they will shoot us. That is true. They will. Airport management has to take the lead. I think the bullet has been bitten by some and they have gone out and they have met the Indians and they have a powwow and it works out real well, many times.

Secondly, there needs to be a more tolerant and comprehensive view by affected citizens and property owners. Now that is easy to say but it can be done. In Seattle, all of the citizens, quote and unquote -- understand, all

wanted the Port of Seattle to buy the entire airport out, all the area, at a cost of \$60 million. After they got into the process they said that was the worst thing that could happen. They did not want their school base decimated. The citizens themselves reversed their field and looked at it then more comprehensively. They looked at it strictly from a community standpoint rather than an individual viewpoint.

I think there needs to be a more realistic viewpoint taken by State and Federal aviation officials. This is the only point where I take issue with John. The FAA, by its charter, has to encourage growth of new airports and new airport facilities for the additional aircraft and flying hours to come, but I guarantee you that you can count off the number of new airport facilities that have been built in this country on these two hands from the ground up and you are not going to see, in my opinion, many new airports of any kind, general aviation or air carrier. I wish that was not true but we do not yet seem to have the mechanism to do that effectively and I think it is foolish to take the view that we are going to have more airports when all the additional aircraft come. Those additional aircraft, those additional hours are going to come right back to the existing facilities and are going to add to the problems already in the file.

The local planners are either very biased environmentally against the airport or are very biased developmentally for the airport, but the local public planners sometimes get too biased.

And, finally, to cover all the bases, there needs to be a more straightforward presentation of information by airport and acoustical consultants. I sat through a meeting the other night where a good acoustical consultant and one of the best airport consultants absolutely confused everybody in the room. I am aware that both airport and acoustical consultants were hooted off the stage relative to the Washington National Airport because they were talking too technically. No one could understand them, all that gibberish -- you know, but I do not.

Finally, let me talk about a couple of things that we can do. Special zoning designations -- Kansas City, I think, is a good case in point. When they established the new airport they formed the Kansas City International Airport District. This is like a planning and development district. I will not go into all the details. There are a lot of details to it but it works pretty well. I will simply say they have a big plan for the airport and the area around it and the zoning tied to that plan. Another one coming along is in Fresno, California, where we have been involved in the development of a combined noise and safety or obstruction zoning ordinance overlay for the present air terminal. That is an overlay process where both the noise and safety areas or zones are imposed on the new subdivisions and the property owners that live within that area. I think we could use these in a lot of the aspects of localized conditions to help protect airports -- soils, floodplains, so forth.

I mentioned the planning development process. I think that is a worthy one to be looked at in a lot of places and finally, let me conclude, I think we are making gains in this. It is a slow process. I think this conference is really the first one to focus on general aviation activity and land use planning and it is high time we are getting information. It is coming along and I think all of us can help with the problem. I do not think

anyone ought to have a rosy future in mind though, in view of Proposition 13, the problems in terms of financing at the local level, and the inability of Congress to agree on any kind of aircraft noise bill for the third time. Frankly, I do not know where the financing is going to come from for the planning we need to do. Even in the ADAP bills the planning gets submerged down in the projects. And I know airport and city managers well enough to know that most of them want to pour concrete; they do not want to do planning studies.

Finally, my two myths. As I said, this will put one foot in each canoe. There is a myth that the presence of an airport facility does not guarantee but tends to attract industrial development activities. This may be true in a few instances. It most often is not true. The airport is a service facility. If the combination is there, it provides a service and a function for that community which may induce a new industrial plant to locate, but I think it has about as much stock as the fact that years ago, when I was a public planner, I used to get a list of industrial development locations. There were 10,000 of them on that list, including Hong Kong who said, "Come to Hong Kong. We have cheap labor. Bring your plant here." True, it is a very important thing when you are talking about attracting industrial development but you have got to have a whole lot of things going for you; it is not a top factor.

Second, presence of or noise from an airport reduces or decreases residential property values. Tell that to the people on the San Francisco peninsula or in the San Jose airport area where the housing values are going up \$1,000 a week and I don't think they will tell you their properties have been depressed. That is not to say it does not have an effect, but the bigger effect is the local economic condition.

In Seattle, at the time we were doing the study six years ago. Boeing was on strike and there was a 6% unemployment rate. Today, you couldn't touch the property at the same ratio you could during those conditions.

MR. JOSEPH R. LEWIS: I think your talk was very, very, enlightening and I agree with an awful lot of it and one thing I agree with completely is that I cannot separate safety from noise -- they both go together. Also, the way you said, the reports and talks will have to be in less technical language. I go to a lot of meetings and it really bothers me because somebody in the community will get up and say something that requires an answer by say the FAA or Port Authority and the representative will get up and start spouting off speeds and what is being said and he gets snowed under. That is why the airport operators and the FAA and the others can get away with the things that have been going on. So any move that we can make to have technical reports and explanations to people in a less technical language would be a big step in the right direction.

Also, about the fact that we need more cooperation between the communities and Federal agencies, State agencies, airport operators, speaking for the New York Area -- and it is probably true in many other areas -- the credibility gap that exists between the communities and the airport operator and the FAA is so great that -- I don't know. I wish I knew the answer to this. I have tried to do something about it but it is like swimming upstream, because the people have been literally lied to for so many years that when you

tell them the truth, they don't believe it. In fact, many times when I will get up and say something at a meeting that is favorable to the airport operator or the FAA, somebody will yell out from the audience, "What did you do, go over to their side?" I mean, this is the attitude and this is something that should be taken into consideration also be everybody.

MR. BERNARD MARTIN: My name is Bernard Martin, Director of Airport Planning, Robert & Company Associates. We are presently conducting an airport site selection for two counties in Metropolitan Atlanta, and we spent several weeks, even months, putting together what we thought was a pretty good public involvement program during the course of the study. We found out it is not as good as we thought it was; it does have several holes. The question I would like to put to you: recognizing that each area requires a unique, particular solution, based on your experience will you enumerate the steps for a good citizenship involvement program?

MR. DOYLE: Okay. I think I can do that pretty quick -- at least I will try. First of all, you have to have some local public staff commitment to handle the myriad administrative details of trying to get maximum participation. Now, you know when I say maximum participation relative to a particular project, that doesn't mean to go around and knock on everybody's door and beg them to come to meetings. Number one, it requires that you go to the maximum lengths to provide input to the process to let the citizens know about it; to invite them in, so to speak, in the planning process as well as the reaction or review process.

Now, when you invite them into the planning process, you know, there are a lot of my good airport manager friends who say that is like inviting a lion right into your tent. But believe me, if you want something that works at the end, you almost have to do that, even in the most controversial situations. So you need a lot of staff time. Consultants cannot do that. Consultants cannot do the day-to-day activities that are associated with the administration of a good citizen's involvement program.

Now, it gets more complicated with the more jurisdictions you have. The fewer jurisdictions you have, the easier it is. I would say use every technique possible. Number one, get maximum word out about it: sell it. Send out notices to 40,000 homes through the county water-billing process -- 40,000 homes, 150,000 people in one project. There was no excuse for anybody not knowing about it. There was also the usual coverage of the press. There were special television programs put together. There were short courses literally developed during the course of the project at the community colleges. There were all kinds of workshops. There were small group sessions. The problem with being in the audience in the lecture process is that it is a difficult situation for most citizens. Most citizens are uncomfortable; they do not want to get up and say something because if they do about the only ones they hear from are just a few who are willing to do that, so you have to figure out what is the problem.

You cannot take anything said as being too frivolous or too stupid or dumb to address. That is often done. The question comes up and it is not properly answered and it should be answered in some effective way, either there or in writing. The problem is the cost of the administration of it. But again, maximum involvement means to get the ideas of the citizens in my

view, as well as aviation interests -- and that means in technical committees, in policy review committees, in workshop sessions.

As we have mentioned, put out newsletters which give your progress reports. Put out fact sheets. Explain how you work out alternatives; how do you wade through 150 alternatives for say a particular thing, how do you reduce that? It takes time -- I know -- but it cannot be done any other way. I know of no way you can do it in six months or seven months for a complicated project. In my judgment it takes two years to go through the process and come out with something that will work at the end. But having been through it a few times, it is worth the time and effort and if you do not do it there is no end. Thank you.

DR. BRAGDON: I am real pleased to have the next speaker here today, Bill Galloway. Bill is Principal Consultant with Bolt, Beranek & Newman in California. I have worked with Bill in the ANSI working group in terms of developing land use planning criteria with noise standards and noise guidelines and I feel he is one of the top authorities in the United States. Bill Galloway.

MR. WILLIAM J. GALLOWAY: Having had the benefit of not hearing at all what was said this morning -- I just arrived at 1:30 -- I may say some things which you may have heard but maybe I will not. I was asked to say something about how noisy general aviation is. That was sort of a general instruction. I thought that what might be useful would be to provide some simple charts. You do not have them because I just brought the originals, which I will turn over to you so you can reproduce them and people can take them before they leave. These make comparisons of small aircraft, propeller-driven small aircraft that are typically mixed in the fleet today, provide some design charts that say: gee, I don't have to go through an elaborate analysis of my airport to at least find out whether or not I should look more carefully at this.

So I am going to show you a series of charts that give you some information on noise that is generated by nothing but small propeller aircraft, to see how far out in this community does some particular day-night average sound levels take place as a function of the number of operations I have. There will be some similar charts for business jets. Two sets; one with a composite, if you will, fleet that existed at the end of 1978 and then -- to show you there is a lot more hope than that might indicate -- some other charts which are sort of a composite of the more recent turbofan engine aircraft that have come into existence since the early 1970's and, of course, the predominant-selling aircraft in the jet market today and are the ones that will constitute the bulk of the fleet for some time to come. I understand Stan Green is going to give you some predictions of this later on in the week, as to what the fleet may be doing in this area.

Then, sort of a last little quick-and-dirty chart. Bob Doyle mentioned that there are a number of airports in which a predominance of general aviation takes place but smaller numbers of carrier operations are either being introduced or have been introduced, and after deregulation -- who knows what is happening these days? So, I am going to give you a chart on not how much noise all the different aircraft in the transport fleet make, but what is the equivalent numbers of small aircraft that each one of those big airplanes constitute at some close-in distance. I am just going to run through these charts.

Now, to start it off -- not with the design charts but just to give you a table -- you are going to get saturated with 36-3 and 36-this and that and the other thing, and FAR-36, appendix three here and appendix up there and all of this sort of stuff; different measures, different performances, different aircraft, different places, different things. For various reasons, the distance of 6500 feet from takeoff roll has become a predominant element in my life in the last few months and it does not sound like too bad a spot at which one could say, well, gee, general aviation airports are typically, and let me say exclusively those airports that are going to have runways in the order of two to maybe 5,000 feet. Presumably, when you get much bigger than that you are getting aircraft operations that will dominate the noise in the community. But 6500 feet is not a bad spot where we could say what kind of levels I am going to get.

The levels I am going to show in the first chart are sound exposure levels, a quantity which you have not heard too much about. Basically, it is a weighted sound level but it also has a duration factor built into it. This is the basic, single-event element that goes into calculating the unweighted average sound level. It is also the single-event noise exposure level measure that was used in California airport noise studies.

(Slide) Well, this is not to give you some be-all, end-all list of things. This takes a representative list of aircraft that are typical of those that operate throughout the fleet. The first column and the top of the second column gives you the spread of propeller aircraft, typical propeller aircraft. Some of the older ones are at the top of the list. As you can see, at the lower noise levels some of the newer prop aircraft are coming in; for example, the Cessna-152, the Cessna 182Q, considerably quieter than the earlier models of 182, things like that.

It shows you that even at 6500 feet, there is a range from about 65 to 102 decibels just from propeller-driven aircraft alone -- and that 37 dB is an awful lot of room. Now in comparison also, the jets are put on at this same distance. It is not really quite fair to compare the jets necessarily at such a close-in distance as compared with, say, the certification distance for jets, which is 6500 meters, three and a third times as far out.

But one thing is significant, and that is, if you look at the bottom of this list, at the lower ones, these are the newer aircraft that are coming into service. These aircraft, even close in, are quieter by as much as 10 or 15 decibels than a lot of the existing propeller aircraft flying around today, aircraft that will be flying around for a long, long time to come. So on the one hand, people think jets are the noisiest things around and that is true if they are very old jets. But there is a whole class of new business jets, general aviation's largest growth area, which are as quiet or quieter than a lot of the propeller aircraft around. Sure, they are a little bit noisier than the smallest training aviation aircraft but they are not any noisier than the average, energy average if you will; if you take the entire prop fleets, the newer jets are just about the same as those. Which means you can intermix those quieter jets with the existing propeller fleet and not significantly change the community noise environment. Not so with the older jets.

MR. GALLOWAY: What this next chart does is it takes the composite propeller-driven fleet alone. By composite I mean, if one takes a thousand measurements at random under a typical general aviation airport and measures a single-event level, what would the level be that would represent the energy spread from all this distribution? Or put alternatively if all the aircraft had this same number then you would simply use this to calculate day-night sound levels directly by just putting in the number of events directly.

MS. LUCIE G. SEARLE: Could I ask you a question while we are waiting?

MR. GALLOWAY: Please, do.

MS. SEARLE: The chart you just showed us, how does that differ from the FAR-36 measurement point on takeoff for the jets? For instance, I know that a Cessna Citation is much lower than the number you had on there. All of those are lower than the number you had on there. All of those are lower on takeoff for FAR-36 measuring points. Why are yours higher?

MR. GALLOWAY: These are all at 6500 feet from brake release, close in at the end of the takeoff of the general aviation airport, as contrasted to the appendix FAR-36 location which is 6500 meters, a little over three and a half nautical miles. So this is less than a third of the distance, so we are much lower at that point. That is the reason.

MR. GALLOWAY: All right, What this tells us is, suppose you have a single runway and you simply want to get a quick look at where in the community would I expect to have certain kinds of these composite noise levels -- day and night average sound level being used here because this is now the measure which is used in place of NEF and CNR by the Department of Housing and Urban Development, by DOD, recommended by EPA and by FAA for use in environmental assessments.

And, what they tell you is you could have x-number of operations per year and you put them all on one runway, then this tells you what the takeoff noise from brake release point would be to gain any particular day to night sound level. Now, if one picks 65, which is pretty far up on that skirt, then that 65 is the new regulation that says 65 or below is an acceptable environment. I am not urging this number on anyone. I am simply picking it as an example here.

Finally, if you go out to 300,000 operations a year -- there are not too many general aviation airports with that number of operations, although there are some. -- that you have a closure point at this 65 dB day-night average sound level, only about 7500 feet into the community. What this tells you is, if this is the kind of measure you want to use, you have to have one whale of a lot of small propeller aircraft before you meet these cumulative measured higher values. Now, the world changes dramatically, of course, if you mix in heavier aircraft with jets of the older type, not jets like the Citation.

So, let's go on and look at what typical business jet is equivalent. Now, I'm sorry -- if you can, translate 300,000 operations at about 7500 feet to get 65 and see what happens with the jets.

ATTENDEE: Excuse me. You are saying hundreds but it reads thousands.

MR. GALLOWAY: Hundreds of thousands is what I meant to say. I am sorry -- 7500 feet is what I thought I said for 300,000 operations a year. Does that come out right to you now?

ATTENDEE: I should have commented on the Ldn 65. If you use a threshold of community noise to the point where they produce pickets, people walk around with antinoise signs and attend meetings and that format, the thing that I see is about a 10 dB conversion. In other words, an Ldn 65 with a major air carrier is worth about 55 at a general aviation airport, and so therefore the threshold is 65, while maybe inside the boundaries that reading is very deceiving. I would say that is about equivalent to a 55. Now, I know California law, for instance, makes no distinction. I am just basing that on my own experience and the airport proprietors here might confirm that.

MR. GALLOWAY: I am not going to endorse one number against the other. That is why the chart goes down to 50 and up to 70. Pick your number and make your choice. Just remember, the traffic noise ought to be counted on here. Here is a number for you to keep in mind. The Cessna Number 172 is one of the most popular airplanes in the general aviation fleet. The Cessna-172, on takeoff at 1,000 feet overhead, makes the same maximum A-level as the normal passenger car driving by you at 50 feet away at 30 miles an hour.

(Slide) Now, this chart gives you the same kind of thing if you talk about new turbofan aircraft. The one I wanted to show for this was for essentially the composite of all existing jets, not just straight jets and turbofan and that sort of thing. You can go through the same exercise of picking the numbers. This is now based on daily operations, which is a little more easy to work with in terms of jets. The reason for putting the previous slides in terms of hundreds of thousands of operations, by the way, is that is typically the kind of thing recorded for an airport if you look at the statistics books -- unless you go out and actually start counting the airplanes. It is a little bit hard sometimes to count that there are 722 prop airplanes per day at a given airport. It is a lot easier to figure out that there may be only five or ten jets going off. But this gives you an idea that you can have a fair number of the newer, quieter jets and still get a day-night sound level which is not terribly different from what you get from a lot of the same kind of prop operations.

(Slide) We go on now. This is the one I wanted to put in before. This shows you the older business jets are obviously very much noisier than the current ones, as we said before. But this chart tells me -- gee, I only have to have three or four or five of these a day to swamp out all my prop operations. So when one talks about business jets he has to be very careful to talk about whether you are working with newer ones, working with fleet averages or what are you doing in your planning.

Remember that the total mix of this fleet of planes is changing dramatically. In 1975 -- I cannot remember the numbers exactly but maybe Stan will correct me if I am wrong. In 1975, 85% of the existing business jet fleet in this country consisted of the older aircraft. At the end of 1978 -- now the fleet has gone up substantially -- over 35% are the new quieter ones, but the rate of addition of these is 85 to 90 percent of all sold are

the quiet ones. If you are doing planning for five to 10 years from now, give some thinking to what kind of aircraft will be expected in the airport.

(Slide) This is an approach design chart which gives you the distance from your threshold of the runway that you are concerned with, the approach noise again for mixes of jets -- new ones and old ones. I did not build an approach noise chart for small aircraft because the approach noise for small aircraft is strictly general aviation props and is relatively insignificant compared to any other kind of noise you have in the vicinity; so it is almost a foolish exercise to draw it if you are drawing something for 43 dB or 53 dB or something like that.

(Slide) This is again the second chart for new jets versus old jets. Now this is the chart that says: okay, if I try to take a quick look at my airport and somebody says I am going to fly in a bunch of Beech 99's and start a commuter service or maybe I have had Beech 99's and although I am strictly general aviation, except for a couple of flights a day, somebody gets a wild idea that maybe he can run DC9's or 737's in once or twice a day. An easy way to use the other charts with this is to put these jets and small props into the context of how many little airplanes would it take to make the same level, and this chart gives you that number. So if you have say 200 small props a day and you put a 727/100 in there on approach, that one approach makes the same amount of total noise that all those small props did. So you can do some game playing that will make it easy for you. If you would comment -- John Wesler, part of the thing he missed was advocating using the new 36-3 Circular that identifies the maximum weight levels of various aircraft types at the FAR-36 locations and putting that information to use in terms of selecting or identifying which aircraft would be appropriate to use at a given facility. You know, this problem recently came up at Santa Monica: how do you arrive at a reasonable level, what criteria, et cetera.

ATTENDEE: What I would ask you for are your viewpoints on the relative correlation say between those kinds of FAR-36 numbers and the levels of noise that are frequently admitted in the community. I think what you have presented here is very useful -- those are flyovers, close-in points where we are generally concerned about the impact of general aviation noise. But I do a lot of my work with vehicle noise and I am very aware of the fact that certain FAA procedures are used for certification. In traffic, automobiles and motorcycles bear little resemblance to what they actually do in the community so I would like to use the kind of information that FAA has made available but I would also like to have some idea of what kind of condition should be placed on the use of that information. Does it give us a viable tool for screening? I know it is all relative levels by saying relative test procedure, but in your opinion how useful is that in terms of eliminating noisier categories of aircraft from using a facility?

MR. GALLOWAY: I think 36-3 could be used in the same fashion. For example, if you will take 36-3 and take the business jets I have listed here on the first chart, the 6500 feet exposure levels versus maxi levels, whatever, and you rank these aircraft, you will find that except for one or two that slip by a dB or two because of the close-in performance, the rank for appearing on the list is almost identical, so one can make that kind of translation. You know, all you have to do is ask people which ones are not and they will tell you. You can go to either kind of a chart, I think, and

decide -- Okay, that is the kind of thing they are talking about. But I think 36-3 is a good step forward. At least you can compare the aircraft on comparable bases, although 6500 meters out for 152 may not be that many.

MR. SWING: It certainly is for noisy aircraft. On a relative basis, it still provides that in terms of comparing them at the same places under the same kinds of operating conditions. Thank you, very much.

ATTENDEE: Would you describe again the mix of the light plane fleet that you used on that -- singles, twins, day-night operation?

MR. GALLOWAY: What this is is a composite. It cuts across the weighted average of the fleet: how many 172's how many 402's, how many 560's that sort of thing that you have got in the fleet. This is such a way that if you had this kind of distribution operating out of an airport, then the energy average -- if you will -- level that you would measure is 6500 feet for that composite fleet, with the numbers used for this. It turns out that it is about 83 dB for a single and about 85 or 86 for a twin at this point in sound exposure level units. It is sort of about two-thirds of the way and the fleet gives you a representational fleet.

ATTENDEE: How much of a standard deviation would you expect from one individual flight? I know there are a lot of questionable data, and I wanted to present one fact; that I guess there were 500 flights analyzed at National, and one air carrier -- that is, a 727 aircraft at 512 flights over nine months was eight decibels difference between carriers. Now there is good reason for that, but I am wondering in G.A. what sort of range would you expect in individual, pilotage type change.

MR. GALLOWAY: Well, it is not only pilots, it is weight and all the rest of the stuff going with it. Close in, I think you would expect that from measurement to measurement you could have as much as five to 10 decibel spread. I think in 100 measurements or 500 measurements the standard deviation close in ought to be no more than about one or two decibels for the same type of aircraft, and less than one for the same type of aircraft for the air.

ATTENDEE: Let me ask one more question. This became an irrelevant point in that last hearing that you and I were involved in. Would you comment on this? People were trying to prove at one time that jets were more offensive than props because of their special characteristics, and I think that in the recent tests that I have witnessed the new generation of business jets are -- I will not say they are generally pleasant, but they certainly do not have these tone characteristics that you have identified with other types of aircraft. Can you generalize on the special characteristics of how they have been changed with the newer generation of aircraft?

MR. GALLOWAY: Well, there is not that much difference in the spectrum. The fact that you are talking 15 to 20 dB lower is the large part of it. I think the second thing is: the original business jets, the early business jets have relatively high pressure ratio engines and you get crackle problems with those that you do not get with the modern bypass fans. So if you actually look at the spectrum of a Citation, for example, in flight it is

really not that much different from a Lear with an early G.E. engine. But the fact that the levels are 20 dB lowered all the way across the board, I think is a large part. That, plus the crackle problem.

MR. E.H. HOOPER: E.H. Hooper, Beech Aircraft. If I can prevail -- I hate to use your time to respond to a question from this gentleman, but I have performed some calculations concerning our aircraft in response to his question regarding the variation. And I am showing that the total variation in single-event noise exposure level due to aircraft piloting, operation procedures, and meteorological conditions -- primarily, temperature -- might not be the five dB that you are talking about but as high as plus or minus 15 dBA.

MR. GALLOWAY: Well, again, this is under what test condition?

MR. HOOPER: This is to cover a range from just 59 degrees to 77 degrees Fahrenheit, and from the very unusual case of a "buzz job" pilot up to the 700-to-1,000 foot altitude that you normally see the 1500 feet from breakaway.

MR. GALLOWAY: I do not disagree that it is possible. I am just saying that if you have people flying normally, the way they should typically be flying, that that is the kind of spread I expected.

DR. BRAGDON: Thank you again, Bill. Well, we are going to move into the economic area. We had some comments earlier by Bob Doyle on the economic impact of general aviation and its need for some support by the local community. This afternoon we are going to have Michael McCarty, who is Manager of the Airport and Environmental Section for NBAA, the National Business Aircraft Association, to give us some insight in terms of how they perceive general aviation activity in relation to its local community.

MR. McMARTY: It's a pleasure to be here today and have this opportunity to describe what impact general aviation has on the country's economy. For one reason or another, there seems to be a mysterious cloud which lingers over the people's version of what role general aviation activity and the community airport plays in their everyday lives. Part of this mystery can be resolved simply by realizing what general aviation really stands for.

"General aviation" itself is that very loose and misleading term which is usually associated with everything except the airlines and military. That means that private business aircraft, air taxis and charters, air freighters, contract carriers, mail plans, pleasure and acrobatic aircraft, flight trainers, crop dusters, banner towing, construction helicopters, blimps, free balloons, gliders, frisbies, and high flyballs to rightfield are all placed in the general aviation category.

With all this activity, no wonder general aviation accounts for 98 percent of the active aircraft, 87 percent of the total hours flown, 65 percent of the aircraft miles flown, and 81 percent of all aircraft operations. It's necessary, however, to go beyond all this and attempt to

identify, in one word, what a majority of general aviation is all about. The word I keep coming back to is "business" -- that's right, general aviation means business.

Two years ago, the St. Louis Globe-Democrat took a survey to identify what function the general aviation activity in the area was serving. The Globe found the 72 percent of the activity was for business and commercial purposes, 23 percent was for personal transportation and proficiency training, and only 5 percent for pleasure.

Now, as I represent business flying which is under this general aviation umbrella, I would like to narrow my text to this specific area. I also believe it would be helpful to briefly describe the business fleet and why companies use aircraft.

There are today some 50,000 business aircraft in the United States, of which nearly 10 percent are turbine powered. This is approximately 17 percent of the total general aviation fleet.

A recent study by an independent research firm shows that, of America's top 1,000 industrial corporations as listed by FORTUNE Magazine, 514 now operate their own business aircraft -- a total of 1,773 planes. This compares with less than 450 companies just four years ago!

BUSINESS WEEK Magazine last year pointed out that "corporate aircraft are radically transforming the way many companies do business. And they are helping to change the geographical tilt of the United States economy, as more companies build plants without regard to the rigid corridors of public transportation." This article also stated that "the impact of corporate flying, moreover, may grow more than the sheer numbers growth would indicate. Increasingly, U.S. companies are using their aircraft as sophisticated tools that do more than simply haul top brass from point-to-point in comfort."

A few examples of company use of business aircraft are:

Oxford Industries, Inc., an Atlanta-based apparel maker that uses a twin-engine Beechcraft to fly department store personnel to its plants where they can oversee orders being produced. According to the firm's Vice Chairman, giving buyers commercial airline tickets would not work because the company's 38 plants are scattered across six southeastern states -- many in towns with grass airstrips that lack commercial service.

Xerox Company is reported to fly 15,000 employees a year on a company owned shuttle plane between its Stanford headquarters and its Rochester, New York, plant -- saving \$410,000 a year over commercial airfares and cutting travel time as well.

One of the key reasons why more and more businesses are turning to the use of their own aircraft is that airline service is declining -- both in numbers of flights and in points served. According to CAB figures, the certificated airlines now serve only 400 points in the Continental United States -- a 30 percent decrease from the 567 served in 1960.

As things stand today, the company airplane may well be the only link for a manager in reaching more than 19,000 unincorporated communities, and even 379 cities with population of over 25,000 that do not have any airline service.

There are, of course, many reasons other than declining airline service for more and more companies to add aircraft to the company inventory of productive tools. But they usually get down to the convenience, mobility, and flexibility that allow managers to increase their radii of action ... to decentralize their plant, warehousing, and marketing structures... to diversify their scope of operations... compete in unpenetrated markets... and to maximize the potentials of plant locations through greater mobility for managers.

The company aircraft can be scheduled to go where the manager wants to go, when he wants to get there; and "there" may be someplace not even served by commercial airlines.

The company aircraft usually provide an office environment that increases management productivity. It is a very common enroute work pattern for a two-to-four man conference to be held. Or individual executives can empty the briefcase of work while traveling -- something they would hesitate to do in the close-quarters setting of a commercial flight. Or, they may plan their business call at the destination city, or prepare their formal trip reports on the way home. In fact, the chief executive officer of one of our larger NBAA member companies says that "...using the company plane is a sneaky way of getting more working time out of our executives."

And, of course, there are the obvious advantages. No time need be lost waiting for the next scheduled flight once business is concluded. Conversely, no efficiency need be lost because sufficient time cannot be allowed to complete the business because the executive must "catch a plane."

From the self-serving point of view of the businesses themselves, it would appear that the use of aircraft is a productive addition to the corporate economy. But, by now you are probably asking what all this has to do with the impact business aviation has on the national economy? What is the public benefit from general aviation activity?

Unfortunately, this has never been measured in any great depth by anyone -- including the Federal Aviation Administration. However, by sampling some individual situations around the nation, it is possible to get a feel for the contributions made by aviation in general, and business aviation in particular.

In Ohio, for example, a statewide airport program was initiated in 1965 with \$6.2 million in State funds. Sixty-four counties participated by building new airports and improving existing facilities. When the State later conducted an evaluation of the program, the following specifics were determined:

At 20 new airports created under the program, almost half of all landings and takeoffs being made were by corporate aircraft and commercial cargo planes.

More than half of 150 manufacturing firms selected at random throughout the state use their air transportation facilities frequently.

The counties with new airports had a three-percent higher payroll rate increase after completion of the airport than did the counties which did not participate.

Extrapolating from the experience of participating counties, compared with non-participating counties, it appears that over a four-year period, Ohio netted \$250 million in additional personal income, and created more than 60,000 new jobs by virtue of the airport development program. That is a benefit-to-cost ratio of 20 to 1.

On a national basis, the JOURNAL OF COMMERCE on March 27, 1978, reported on the growth of the corporate aircraft fleet, and stated that, "...over 1,000 plants in the last three years have been located in the areas distant from major city airports. Decentralization makes it tougher to keep tabs on operations without bloating the executive ranks. In addition, the airports with airline service are dwindling."

Many towns and communities nationally recognize this. Lee's Summit, Kansas, for example, recently purchased a private airport for the City, and is extending the runway from 2,400 to 3,000 feet to accommodate twin-engine aircraft. The stated purpose is to make the airport an attraction for industry.

Dr. A. Erskine Sproul, Chairman of the Shenandoah Valley Airport Commission, at Staunton, Virginia, reported that 10 new industries employing at least 4,000 people have moved into the area in the last 17 years, and airport facilities were listed as a prerequisite by all of them.

The Milan, Tennessee, MIRROR, reported last year on Gibson County's opening of a new airport with a 4,500 foot runway to "handle all business jets and piston driven planes..." Mr. Argyle Graves, Chairman of the Airport Commission, was quoted as saying, "Seventy-five percent of prospective plants use jets, and I know of one big plant which bypassed Milan and went to a neighboring Tennessee town because they had adequate airport facilities. Contrary to what many people think," Mr. Graves continued, "airports are not a luxury enjoyed by a few. They have become vital links for the business world. With the new facilities at Gibson County Airport, a business executive can fly to Chicago and back and transact his business in less than eight hours. I feel that the airport will be one of the county's greatest assets."

In 1978, the Santa Barbara, California, NEWS PRESS ran a roundup on local airports and what they contribute to the economy. They stated that because of industry located on the airport, the Santa Maria Public Airport provides jobs for 1,600 area residents. It makes possible private and airline transport to cattlemen and vegetable producers. Columbia Records uses it for air freight service; oil companies use it as a staging airport for geologists in the area. The report also included the Lompoc Airport, with a 3,600 foot runway, and states that this airport has 16 persons employed on it with an annual payroll of \$100,000.

The Oxnard, California, PRESS-COURIER reported that the Camarillo Airport, with 90,000 takeoffs and landings in 1977, generated \$310,000 in revenue -- more than it costs the county to operate the airport. It also generated \$64,000 in local taxes. In addition, tenants at the airport employ approximately 390 persons with a payroll of over \$3.5 million annually.

At Odessa, Texas, the Airport Board surveyed 135 businesses selected at random in the area and found that 46 percent of the companies had customers, business associates, or company personnel who travel to and from Odessa by business aircraft. This represents a passenger flow of 385 passengers a month traveling by other than scheduled aircraft. Over 50 percent of the businesses that operate aircraft to Odessa stated that additional facilities would encourage more use of the airport.

The Santa Ana, California, Chamber of Commerce sent questionnaires to 1,000 randomly selected businesses in the area and received 518 replies. Seventy-one percent of the replies showed a need for air transportation facilities. Twenty-eight percent of the 518 companies said the Orange County Airport had influenced the decision to locate within the County.

Twenty-five percent said they use general aviation aircraft, and average ten flights per month. Of that group, roughly 40 percent -- or 51 companies -- had their own aircraft; the remainder chose to use charter flights.

All these examples support the finding of a U.S. Department of Commerce survey which polled 3,000 manufacturing firms to determine factors influencing industry location decisions. The availability of air service and preferred community size were two survey items. For 11 percent, availability of air service was considered critical; and for 17 percent, significant. Cities of under 25,000 were the preferred size for 20 percent of the firms, with 38 percent choosing cities of 50,000 or less.

Another survey of leading United States firms revealed that 80 percent would not locate a plant in an area lacking an airport, and 57 percent indicated that the airport should be capable of handling heavy twin engine aircraft.

In addition to bringing business into a community and helping local people to conduct business outside the community, airports bring very tangible benefits to the entire population. The access an airport provides and the employment opportunities it offers are easily recognized. Less apparent, perhaps, but no less important are:

1. Value of time saved (by passenger plus "domino effect")
 - A. Business flying
 - B. Pleasure flying
 - C. Utility flying

2. Emergency value (human life and property)
 - A. Natural disaster (earthquakes, floods, wind and weather)
 - B. Crime control and law enforcement
 - C. Riots and civil disturbances
 - D. Rescue and life savings
 - E. Forest fire fighting
3. National defense value
 - A. Pilot training and availability
 - B. Value to war time combat use
 - C. Civil Air Patrol
4. Promotion or stimulation of air carrier flying -- provides valuable feeder traffic.
5. Entertainment value
 - A. Value to general aviation passengers (in terms of gratification)
 - 1) Air shows
 - 2) Radio, TV, movies
 - 3) Vacation and resort area development
 - 4) Sightseeing and other transportation modes
 - B. Value to entertainment industry
6. General business industry associated with general aviation travel
 - A. Hotels
 - B. Ground transportation (taxi, limousine, car rental, etc.)
 - C. Meals
7. Specific benefits related to general aviation
 - A. Aerial photography and mapping
 - B. Fish spotting and fish savings
 - C. Forest fire patrol
 - D. Power and pipeline patrol
 - E. Corporation internal business aircraft management, maintenance, and operations, personnel and expenses.

The local airport is rapidly becoming the principal gateway to the nation's modern transportation system. Communities large and small are realizing that to be without air service today is as detrimental to their development as being bypassed by the railroads was a century ago, or left off the highway map 25 years ago.

Communities that are not readily accessible to the airways may suffer penalties that can affect every local citizen -- whether he flies in a general aviation aircraft, uses commercial airlines, or never has occasion to travel at all.

The role of the general aviation airport in providing air access is increasing. By having access to all the Nation's airports, general aviation aircraft can bring the benefits and values of air transportation to this entire country.

THROUGHOUT THE COUNTRY, AIRPORTS AND GENERAL AVIATION MEAN BUSINESS.

MR. LEWIS: You paint a very rosy picture about an airport coming into a community, and a lot of it is true, but what you have not told us about is when a new airport comes in and a new industry comes in, how many people that have lived in the community are hired for this new industry; or do they bring in people from the outside, thereby increasing the burdens on the police, fire department and everything else because new homes have to go up? These all have to be taken into consideration. And what I am thinking of is a situation that developed in Newbergh, New York a number of years ago.

When the MTA, I think it was, took over the airport and expanded it, they sold the people there a bill of goods about -- Newbergh is going to be put on the map, it is going to be the answer to New York City and everything else. They had public meetings and we went up there, I and two other people who knew something about aircraft noise and what airplanes do to a community to try to tell these people that they were being given a snow job -- and I use the term "snow job" very often because this is what a lot of agencies and groups do to people. Well, we were practically booed out of town. Even the Mayor said, "These fellows don't know what they are talking about." Well, if we went up there today I think they would give us a tickertape parade through town. So when you paint the rosy picture, paint the other side of it too. Now, if you have comments I would be interested to hear them.

MR. McCARTY: As I said, there are not a lot of available figures; figures on when a plant comes into a community how many people they are going to employ. Certainly, the employment ranks is one consideration a company is going to look at before they build in any given area. And when you say that it means new homes and things like that, certainly it means new development. Basically, I think we have to realize that there is no such thing as a free lunch. We have to realize that we are going to have to balance the importance of the airport and some of the problems that may be associated with the continual growth.

MR. LEWIS: Who is supposed to make that decision -- the local government of that area, the airport operator, or the people that are living in the area who are going to be affected by the increase in noise pollution and everything else?

MR. McCARTY: I think that the size of the airport itself and the facilities you want to offer are up to the citizenry. But once you make that decision, that is when land use control and planning come into effect. It should not be a decision that is made -- Well, we sure would like to see Allis Chalmers but --

MR. LEWIS: Well, the thing is that too many times I find this to be so. The people are brought into the picture after decisions have been made and this is wrong. This is why we have all these problems. People have to be brought in from day one, not day two. This does not happen.

MR. McCARTY: Well, I will certainly agree with that. Communication is a big thing and I know that my association has the same problems by the fact that FAA and other Federal agencies do certain things without consulting us. And so I definitely support an open discussion by all parties involved.

MR. LEWIS: You see, I represent local government, and local government is just that, local government. I mean, our residents can talk to our elected officials. They can call them up at home and everything else, and we are concerned about what is happening -- which is not the case in a lot of other areas, unfortunately. That is why sometimes I may sound like some guy out carrying a picket sign. And I have carried picket signs too, objecting to JFK and everything else, and I am proud of it. But the thing is, FAA, airport operators, various aviation industry associations must take into consideration the people living under the paths of those airplanes, whether they are talking about a Cessna or a 747 or a Concorde or anything else. And until the aviation community admits this and does something about it, we are going to have problems.

DR. BRAGDON: Thanks again, Mike, for your presentation. At this time we have the last role player, so to speak, in this afternoon session. We have had some comments about citizen groups but this individual represents a very active and professionally involved group. Her name is Joan Caldwell. She is President of the Northwest Greenwich Association of Greenwich, Connecticut. Joan is going to be discussing an issue that she has been dealing with quite a while, the impact of general aviation activity on airport community residents.

MS. JOAN CALDWELL: It is at moments like this that I wish I was a lot taller.

Last week I had the privilege of working for a five-day session with members of the Eastern Region FAA and the New York Port Authority. We were a group of 18. I was the only female and the only member of a citizens group, and when I was introduced, I was introduced as the enemy. I would hope that you will not view me the same way. As for how I view aircraft, I think it is a necessary part of our commercial community. I think that airports and aircraft owners can be made good neighbors and that is what I been have working on for the past five or six years. The FAA is distributing a publication called, The Westchester Experiment. I have a copy which has been reproduced and distributed to you. I would like to pass along this publication because I think what you need to know is how one community was plagued -- and that is the word I want to use -- by aircraft noise and how we have chosen to deal with it.

Westchester County Airport is located on the New York-Connecticut line. It was plunked right down in the middle of four residential communities which, if you look at their incorporation charters, were there probably at the time that this country became a country. So it was not the question of the neighborhood moving in on the airport. The airport moved in on the neighborhood.

When it was created, it was created as a military base and served the northeast area during World War II. At the end of the war the State deeded the property to the county and the county continued to operate the facility as a general aviation airport, servicing primarily single engine piston aircraft. In those days it was rather fun to get in the car and take a Sunday afternoon trip to go out and see all the airplanes. But then, sometime around 1962, a phenomenon took place and instead of having a piston engine, you began to get the corporate jets and with them the tremendous exposure to noise.

The corporate fleet increased tremendously and throughout the late '60's we found ourselves with more and more planes coming in and out and particularly late-hour traffic; traffic that disturbed the residents' sleep, disturbed the pleasure of their homes during the weekends, and just disturbed the residents generally. As a community and as a home owner association which has long been established, we tried to deal with this, as we tried to deal with any problem within our community. That is when I was made representative of the Westchester County citizens group.

Now let me explain here, Westchester County Airport was owned and still is owned by Westchester County, New York. It was operated by the Gulf Oil Company in their holding operation. It is now operated by PanAm Airlines. Greenwich, Connecticut is a political subdivision that has nothing to do with Westchester County. They could not care less about us at that point if they tried. We had no votes to hand them. That is what they were looking for.

So, my predecessor and I would go from office to office, from FAA to operator to owner, seeking some relief from this noise exposure which was increasing. We would be very gently passed off to the next man. The FAA said it was the operator; the operator said it was the owner; the owner said it was the FAA, and we had a merry shell game.

In 1973, the operations of Westchester County Airport were 282,000. That is a lot of operations. A good percentage of them were the corporate jets. We had in addition, however, military aircraft. We had the Skymaster and the training operation for the Air National Guard. It is a push-pull job. Some of you may know it. It has a prop on the back. The prop on the back sets up conflicting air currents with two struts. It is a funny looking little plane. Four of those in formation will take the fillings right out of your back teeth, and we had to do something about that.

We had the single-engine pistons and training operations and these formed what I called the "daisy chains." If you sat out in the backyard you could see five or six of them circling all around -- and it would go on from ten or eleven o'clock on Saturday morning to four or five. It was like reaching for a fly; you could not quite get it. You knew it was annoying you and you could not get it and you could not stop it.

We had the commercial airlines. At that time it was Mohawk, a single airline; now it was Allegheny, which operated very infrequently but when it did you knew it did. You could hear it for miles. All of these in 1973 until the neighbors had had it and I said okay. We filed a \$20 million lawsuit with the Federal Court. We had to get the mule's attention. We got it. We filed a suit against Westchester County as the owner, the FAA for controlling the airspace, Gulf Oil as the operator, and we were willing to invite anyone else to the birthday party we could think of.

What happened was the County, I think largely with the efforts of the NBAA, decided that negotiation with the neighbors was a better way to go, and it is the way that I would strongly recommend to you because the problems with airport noise stem from the fact that; one, the neighbors do not know and do not understand, and; two, they think you do not know and you do not understand

their problems. Dialogue, if it is begun early and particularly if you are going to get into any long-range planning, can diffuse opposition long before the opposition has a chance to form.

In the case of Westchester, they came in and said we would like to negotiate. My immediate reaction was no way -- for three reasons. One, I did not trust them. I did not trust them at all. Two, I was afraid that unprogrammed informal negotiations could go on with no meaningful progress. Three, I was afraid that long-term or prolonged negotiations would empty our coffers of the money that we had set aside, and we were ready to go the whole way. So what we did was set up a settlement stipulation and in it we asked for negotiations using residents in this case represented by the Town of Greenwich, who instituted the suit along with the Home Owners Association of which I am President. On the opposite side of the table we had the NBAA as representative of the corporations flying out of the airport, and the local pilot's organization, representative of the people operating that aircraft. We had and still have as resource people the FAA tower man, the airport operator, and occasionally a representative of the airport owners, Westchester County.

The agreement was satisfactory to us and so it was signed and submitted to the Court. We are now functioning under that. We have been functioning for four years. Attached as an appendix to that stipulation was the following document, which says the committee shall initially consider, study, and if possible, report on the following items:

1. Nighttime operations at the airport between the hours of 11:00 p.m. and 7:00 a.m.
2. Abatement of noise disturbances from engine run-ups and ground operations.
3. Touch-and-go flight procedures.
4. Scheduling of student pilot training.
5. The feasibility and desirability of establishing a preferential runway system.
6. Runway restrictions.
7. Raising the floor under the LaGuardia Control area in and around Westchester County Airport to a minimum of 4,000 feet MSL, or above, from its current floor of 3,000 feet MSL.
8. The safest and most desirable angle for the existing glide slope and any future glide slopes that might be installed.
9. The installation of a VASI system on Runways 11, 29, and 16.
10. The feasibility, desirability and possible consequences of the installation of noise monitoring equipment.
11. Helicopter operations.

12. Use of thrust reversers.
13. Discussion, proposal and implementation of other practices and procedures which will reduce noise and emissions and increase safety from the operation of Westchester County Airport.

Now, this list was put together by the Home Owners Association based on the kind of problems we have had. In four years, we have helped to make Westchester Airport a better neighbor. There is long way to go but we are on our way. The key to it is trust and credibility. It means I have to do my homework before I go in that negotiating room, but so does the pilot and so does the FAA. And when we go in there, we go in with a common purpose and that is to solve the problems in the most amicable fashion possible and the safest way possible.

The first negotiation session was held in September, about four years ago. I remember it very clearly because there was some question in my mind as to who was going to come out scarred. It was a hostile session. There was a great deal of anger expressed on both sides of the table. This I can say, from other experiences I have had, you can expect. You can give the community that has been impacted by the airport the opportunity to vent anger and its frustrations, but once that has happened, once that is clear and the air is freshened, then you can begin to work for positive solutions. And it is in that fashion that you will come out with a noise abatement procedure that will work.

In terms of Westchester, the impacts on the surrounding neighbors were two-fold. One, you took a man's house in a sense. You flew over it, making it at times a very unpleasant place to be. You had also an impact on its economic value. In the case of Greenwich, Connecticut, what you had been flying over was the highest tax base in the town. Right now those properties are selling for between a quarter and a half million dollars, and anything that jeopardizes that tax base affects the whole town. So it was a community problem. It was not just a neighborhood problem.

In terms of communities and long-term planning, there is a long-term plan being developed for Westchester County Airport and our association has been involved in it. But there is some concern on the part of the Home Owners Association and in my mind as to whether or not Westchester County's plan for the airport and the use of the land around the airport under their control is compatible with what is already existing in Connecticut. We have not been able to, what I call, get a good meaningful dialogue going back and forth.

In terms of the master plan, there was one meeting held in Greenwich. In all honesty, I should say that we probably had the first meeting to air and presumably get some opinion from the residents of Greenwich as to what should be done with the airport. I have attended a great many public meetings. This has to have been the worst. We had well over 60 people there. We had a turn-away crowd with very little opportunity for the citizens to speak. Instead, the master planner came in with charts, with diagrams, with a great deal of technical description, and in the end he successfully convinced 60 people that they were being hoodwinked and not told the truth.

That was not what he went in there to do. That was not what he intended to do. And I don't think that was the case, but that is the impression he left. And since he had come, I have had the job of repairing the fence, of trying to make them believe that Westchester County does care; that it is trying to plan an airport that will be a good neighbor, that will not commercially expand and that in fact there is still good faith and bargaining going on in these negotiations.

It is tough, but citizen involvement and involving citizens in a meaningful way is the only way we are going to solve the problems we have got today and, unfortunately, we have run into a problem in Westchester County. I would like to answer your questions.

MR. KENNETH J. DELINO: My name is Ken Delino of Systems Control, Inc. You never told us if any of the noise stopped.

MS. CALDWELL: We have reduced the noise to the point where I can honestly say that I do not find the airport as objectionable as it was four or five years ago. However, we instituted the use of a voluntary curfew on takeoffs between 11:00 o'clock at night and 6:30 in the morning. Now, that curfew is about 76% effective. The other 25% stands out so much that in future negotiations, in fact, in the set coming up I plan to raise the subject of how we are going to create something more effective and forceful. These are residential communities. People are entitled to sleep. We did eliminate the use of reverse thrust at night. It was a terrible situation. We have managed to reduce, or better control engine runup, high-frequency runups. We placed these on the airport in such a fashion now that -- well, in general, in using a number of procedures, yes, we have reduced noise to a point where yes, it is a better neighborhood but we go step by step.

MR. JAMES F. WALTERS: Jim Walters, National Park Service, Grand Canyon. We are constantly hearing complaints in the Park Service concerning aircraft noise. In talking with the people, we find that a lot of the animosity and the feeling is directed toward a frustration concerning not so much the decibel levels but there is an intrusion upon peace and quiet in the park. I wondered how you attempted to quantify exactly what it was that was irksome to people; or do you have to quantify it?

MS. CALDWELL: Yes, we did have to quantify it. The comparison of the single-engine piston and the jet is just itself incomprehensible. One can understand how the jet can bother and annoy, but to say this little plane is bothering you the pilots would not believe it. We had to bring people in and have them actually explain what was the way it annoyed them. It was the rapidity of it overhead; it was a little bit fear, where there is a very low ambient noise level.

MR. WALTERS: Thank you very much. I think you are beginning to identify what is going to be more and more a problem around the U.S., and certainly the National Park Services are trying to address the problems in those areas that are specifically set aside to maintain peace and quiet. Good luck to you.

MS. CALDWELL: I might add here that one of the things we were doing last week at LaGuardia was working with the FAA on what they called a

Community Involvement Program. They have a publication out and it has got some good material in it. I told them if they had done it 15 years ago we would have all been a lot happier. The important thing here is that for those of you who are working in communities there are some excellent guidelines and suggestions. And, one of the things that I cannot too strongly emphasize is that if you are fortunate enough to get a couple of dozen residents into a public meeting, the way you structure your meeting will determine its success.

If you stand up here and talk to them the way I am talking to you, you can count on having a flop. But if you open it up and encourage them to talk, by either asking questions or just allowing them to complain to you, you will then vent the anger and pretty soon you will have a couple of dozen people who are really talking up the problem and working towards solutions.

MR. WALTERS: Where or how does one get a group like that in say a National Park somewhere, where they are changing people all the time? I get notices from people who are way out on the back country or in some meditation center or somewhere quite removed from an airport. If you are right around the airport, you own the property there, I can understand a reason for your getting together and for advocating a particular policy. I am absolutely convinced that there is no one who can influence public policy more than an organized citizens group. I don't think there is anyone in Washington or Congress or whatever who wouldn't listen to an organized citizens group at the local level because it is a local issue. So how does one structure a meeting, even if you want to have it open, when you have got people who are coming and going and do not own the property?

MS. CALDWELL: Where you have transients in an area it is obviously very difficult if not perhaps impossible. Curiously enough, one of the people at this meeting last week has done a great deal of work with the Department of Interior, its parks in California, and he indicated that he had been running into this and what they have done is:

They have gone through -- I guess there are registration slips that have to be filled out to use the Federal parklands. They have gone through those registration slips and found the repeaters, those that came back from year to year and sent them notices that there would be a public meeting. Those in the area did come and his indication, if I remember correctly, was that they had group of about 50. And that 50 made their concerns and their apprehensions known. This then became kind of a task force who could from time to time deal with the airport question on a level, and I guess that it is an ongoing thing. I would be glad to give you his name.

DR. BRAGDON: Any other questions? I would like to find out about this publication. Maybe John could enlighten us in terms of possibly getting it or making it available. It is a May '79 date.

MS. CALDWELL: FAA, EE-79-06, published May, 1979.

MR. WESLER: My office published it and I would be happy to provide copies to any of you who would like it, if I can provide such copies to Cliff to be included in your handouts of your transcript.

This is in the nature of a workbook which is being used in a series of seminars around the country to teach our own people, speaking for the FAA as well as others involved in airports, airport noise and other environmental problems on how to conduct an effective participation program.

MS. CALDWELL: But the procedures are excellent. I mean, I have gone through it and they will work just as well for an airport operator trying to reach into his community or an airport owner. Thank you.

PANEL DISCUSSION

October 3, 1979

4:00 o'clock, p.m.

DR. BRAGDON: I would like to introduce the five panelists. John Tyler is on my far left, consultant with N.O.I.S.E., the National Organization to Insure Sound Control Environment, for Glastonbury, Connecticut. Joe Lewis, immediately to my left, is Executive Director of Town-Village Aircraft Safety and Noise Abatement Committee, from Lawrence, New York, Town of Hempstead. Jack Swing, next to John Tyler. Jack is with the California Department of Public Health, located in Berkeley, California. Shirley Grindle, citizens representative from Orange County, California. We are pleased to have Shirley here. And the last person, directly in the middle, Angelo Campanella, President ACCULAB, Columbus, Ohio.

MR. JOHN TYLER: While we are waiting for Cliff to work out this little detail, let me make an announcement. Whereas I am listed as a consultant to N.O.I.S.E. -- N.O.I.S.E. is an organization called the National Organization to Insure Sound Control Environment -- I am in no position to speak for N.O.I.S.E. You know, a consultant responds when he is asked something but he does not speak for the organization that he works for. So, let the record show that I am not speaking for them.

ATTENDEE: Who are you speaking for, John?

MR. TYLER: Just let me take a second. Bill Sperry asks who do I speak for. Just to give you a little background, I have been an employee for Pratt-Whitney Aircraft for a period of 30-odd years in charge of jet aircraft noise research and development. Prior to that, I have worked in the aviation field. As a matter of fact, I worked on the first DC3 that was being built for American Airlines back in 1937. As a result, I have a rather wide experience of aircraft problems, both in the vibration field and noise field. At the present time I am doing work primarily for communities around airports, which maybe some people might think is a switch after working for industry. But as a matter of fact, it turns out to be just the same kind of material, applied pretty much in the same way as when I worked for Pratt and Whitney.

MR. JOSEPH R. LEWIS: I am the Executive Director of the Town-Village Aircraft Safety and Noise Abatement Committee, which is in the office of the local government of the Town of Hempstead, New York, and which concerns itself with aircraft noise and safety of the airport. Now the Town of Hempstead has a population of about 85,000 people. Thirty-eight percent of the population is affected by the noise of Kennedy Airport, and when you talk about safety, just about everybody in the town is concerned with safety in operations at Kennedy Airport. We have been making some progress though, even though some of the things I may have said here today, questions and all -- I may have been giving you the impression that the FAA is all bad -- sounded otherwise. FAA is not really all bad; it is about 95% bad.

MR. LEWIS: Now the thing I have found, the important thing -- and this is something I think that everybody should bring home with them -- is when they are dealing with a government agency, do your homework. Because

when you come up against these fellows in the Regional Offices, if they know you have not done your homework they are going to walk all over you. These books I have are just samples of some of the records we have back in the office. We have about 30 or 35 big, thick looseleaf books with records. In fact, I daresay, John, some of our records are better than the FAA records of Kennedy Airport.

And we get things done. We have gotten them to comply with the preferential runway system up there just about as close as is humanly possible to get. We have gotten them to comply with the midnight runway selection program, which is a big thing too. We still have a couple of controllers that are rugged individualists, but we are working on them also and we will have them in line before long; won't we, John? That is about all I can say. As we go along, if any of you have any questions I will give you the right answers.

MS. SHIRLEY GRINDLE: I was introduced this afternoon by Cliff as being a citizen representative from Orange County, California -- and I would like to add a little bit to that. I spent four years between 1973 and 1977 on the Orange County Planning Commission -- two of those years as its chairman. And one of the biggest issues that surfaced during those four years and is now becoming one of the biggest political issues in Orange County has to do with airport noise activity.

At the time that I was on the Commission, the big issue was whether or not to allow residential development around the El Toro Marine Corps Air Base. The issue has not gone beyond that to one of where are we going to build another commercial, general aviation airport in Orange County. I do not want to get into that subject right now, but later on, if anyone would like to know more about that issue, I would be glad to maybe try and enter into it during our panel discussion.

I would like to say something today about the speakers. I related to many of them but I noticed that every one of them said that the most difficult aspect of correcting the conflict between airport noise and land use was the land use aspect. In other words, you could change the FAA standards and enforce them or you could change the operational procedures or the third solution was to do something about the land use, and every one of them said that was the most difficult one to deal with. But nobody said why. It is as though all of us really ignore how those land use decisions came about, and maybe that is because as a nation we have become very apathetic. We accept as a way of life the political decisions that ended up creating these problems to begin with. Someone at every airport, some local jurisdiction, a city council or board of supervisors had to approve the land use or disapprove it.

If we were to have a chairman of the Orange County Board of Supervisors sitting here today, I would ask him one question. In face of all history and all of the facts about conflicts between home owners and airport activity, why, chairman so-and-so, did you recently approve a 500-unit development 100 feet from the end of the airport runway? Now, he is not going to tell us the answer. In fact, he will probably be sweating about that time, but the real answer is that probably -- undoubtedly -- the person who owned that property was a major campaign contributor to get him reelected.

So I am saying that most of the problems of airport conflicts with residential property owners have come about because of very, very poor political decisions. We have the knowledge. We have the ability. We have the planning ability and we have the technical knowledge to not have any of this happen, but we do not have politicians in this country who have the integrity and the long-range vision to make decisions that protect the long-range future, because the long-range future to a politician is his next election -- and that is one of the big problems.

MR. ANGELO J. CAMPANELLA: My name is Angelo Campanella. By way of introduction here, I will mention some of my background. In this general area of technology, I am a consultant in acoustics and noise control. Among my many activities have been the noise analysis for at least three general aviation airports around Ohio. I spent the last year, a meeting or so a month, on a committee in the City of Columbus, Ohio to help redraft all of the city ordinances against noise to bring them up to date and make them compatible with the people that have to enforce them.

I have performed perhaps a dozen-odd noise analyses for developers of residential tracts of land, none next to airports for a reason that I will state in a moment, but a lot near highways and railroads. I have had inquiries over the phone about airport noise but it never went very far. The problem there is that the people come to me seeking FHA financing, insurance for mortgages, and FHA throws the ball to HUD and HUD pulls out the 13.92 and, lo and behold, in 13.92 they allow anything up to -- 30. And you go to most general aviation airports and not get you up to Ldn 65, so that means no noise analysis required. That is the problem with the one organization that does have some clout, so to speak, which is HUD, in the planning phase.

They have a couple of comments here, but again I sense the same thing. I see no action whatsoever, certainly in my area, on the part of local officials to do land planning with respect to the noise about airports. I know that the NEF contours exist now and the ranges have to be applied and, certainly, I will spend the next year of any volunteer time trying to help them come to some conclusion in that area.

Some comments along the way here for the young lady from Massachusetts. You mentioned something about ILS impact and that brings an interesting fact up. Every time a master plan comes along, for those that have to be rationalized -- and I use the word rationalize for obvious reasons -- as to how these airport improvements are going to affect the environment, and the two items that always come up are the length of the runway and the installation of the ILS or landing systems. Taxiways come up too but that is not usually a factor. And often as not, I have heard some of the semi-experts who will say that an ILS will reduce noise and that a longer runway can reduce noise also. I do not necessarily support that. I think the public is fairly quick to pick up the fact that this might not be so. And we need more definition in those areas as to show exactly what the impact the long runway and the ILS system would be. This is undeveloped territory to my knowledge right now.

I wish I could learn what would motivate the officials to provide sensible land use plans about airports. It is critical and it may be that it will take some serious impacts like they have had in Los Angeles and

Westchester County and so forth to bring those officials to the point where they realize that there is a real problem, that the airport is not going to go away and that it is a permanent member of their community and it needs to be treated as such, a permanent facility, just as a river or harbor and so on.

MR. JACK SWING: We could spend a bit of time discussing the, quote, California experience, but there are enough people here from California that we will hear plenty of that. There are a couple of things we do do in California that I think are significant that begin to address this problem. We do require land use planning elements of each community's general plan. I mean, the fact that we require a community general plan in the first place is somewhat unique. Very few states in the country require that. Our general planning requires a noise planning element to-boot. If this were not enough, we also created airport land use commissions, which I am sure Shirley has dealt with extensively. They have not been largely effective but at least we are recognizing that airport noise is a unique, distinct problem. And they do not limit their activities only to commercial airports. They are beginning to consider general aviation airports more and more.

The particular types of problems we run into, and through my office we get quite a number of complaints on noise pollution problems throughout the State, we deal with some and some we try and pass on to local agencies for their own resolution -- but we end up doing a traveling road show. Quite regularly, we go out and attempt to offer suggestions on what the problems may entail and some concepts for solutions. I have been very involved in the El Toro Marine Base situation down in Orange County. But I see a couple of things that have been said by our previous speakers that I recognize happening in California more and more that make general aviation noise a unique problem. And if I may generalize, which I am going to do anyway, we see quite a number of situations in which general aviation noise tends to affect higher income residential areas.

L.A. International tends to affect Inglewood and a number of let's say lower economic strata. You get into a situation where Torrance Airport affects Rolling Hills, some rather expensive real estate. Orange County Airport is sort of a mix of commercial and general aviation. It affects a lot of expensive homes sites. We see this happening throughout the state.

There are two ramifications of that. Impacted people are well informed about the law, about their political and legal recourse to a noise intrusion. These people also have moved a bit beyond the fundamental demands of just eating and those kinds of things that the lower incomes deal with. So they now are more concerned with their peace and quiet and enjoying their environment. General aviation noise affects a slightly different portion of the population.

This other thing that we talked about earlier, a number of people mentioned. It generally affects them at rather lower levels than in the commercial airports. Seeing an Ldn 65 would be rather an extreme situation for most general aviation airports in California. Typically, the levels are well below that. So we see that it is not perhaps the composite exposure that is bothering people. It is single events, and this has been brought out by Mr. Doyle and I think even Chuck Elkins made some allusion to that.

I wrote an editorial a few months ago that appeared in the Institute of Noise Control Engineering Magazine, copies of which are being prepared and will be available for you in the morning. It received a lot of criticism and that was the plan. You will receive a copy of that in the morning, and in this editorial I suggest there are two or three potential solutions to let's say an aircraft noise problem, and the solution really needs to take the form of a balance. I am suggesting that within California, especially, encroachment is really here today. We are not dealing with unimpacted airports anymore; we are dealing with the facts of life that wherever you build a house, if it is between the runways at El Toro, someone is going to try to do it. So we can fight the real estate battles over and over and will probably lose. So then you deal with the situation, how to achieve compatibility or how do you reduce the impact of this aircraft noise. There are a couple of solutions we talked about in the editorial. You can place people in bomb shelters. In Minnesota that might not be a bad idea because it is pretty damned cold back there and the mosquitoes eat you in the summer time. So that might work in some parts of the country. It may be compatible with your life style.

There are other things you can do. You can get people to waive their rights to all future use of the airport, future recourse to the airport. One of my pet peeves is aviation easements, and I am going to badger John Wesler about that after a while. And then there is another possible partial solution, and that is if we can adequately inform people of the effects of noise, of this particular noise from a general aviation or any other source of annoyance; describe that noise in such terms that they can relate it to their everyday human activities. Then they can make an informed decision. Is this noise really a significant impact? Will it really alter my life style?

MR. JOHN TYLER: I guess everybody up here is making a speech. We are here not more than a half hour, more than halfway through our hour and I do not know how much time we will have for you to ask questions and for us to ask questions, but let me make a little speech and end it up with a question. And the question is to John Wesler and it has to do with the subject that has been discussed by practically each of the panelists coming up to me.

The airport system throughout the United States started off with a bunch of strips in cow pastures and places around the country where people had airplanes and wanted to fly them. There was a great impetus to this airport development during World War II when somebody in Federal Government decided it would be desirable to have little airports spread throughout the country to protect the communities surrounding those airports. Looking back, it was a pretty ridiculous idea but, at any rate, a lot of airports got developed at that time. And after the war was over the Federal Government deeded these airports over to the communities that surrounded the airports. Maybe the communities would not have gone out of their way to develop an airport there but since they were given an airport they developed it there.

Now many of these airports were put in positions where they were surrounded by towns that have been there from back to the Revolutionary times. In fact, we heard an example this morning about Westchester County. Look at Clover Field which was an airport which served a Douglas Aircraft production facility outside of Chicago during World War II. At the end of the war it was turned over to the City of Chicago and became the primary airport

for Chicago. The towns along the railroad, Des Plaines, Park Ridge, the whole district had been there for generations and after the airport was established, it was in the middle 1960's (1966) when President Johnson appointed a task force supervised by his science-technology adviser. This particular effort was called the Program Evaluation and Development Committee, and it was chaired by Nick Gollivan.

During that period there was a major national effort to do something about aircraft noise. As part of this program, the lawyer for the City of Chicago was asked to provide some justification for the attitude which the City of Chicago took with regard to the area surrounding the airport. He very naively gave a very honest expose of the internal philosophy of the group that ran O'Hare. He said, what we need is authority to control land use out to ten miles from the center of the airport in all directions. He pointed out that the airport expected to expand rapidly. They had some runways that were there when the airport was turned over to the city. They had already added a few and they knew they were going to add some more, but they had no idea of where they wanted to add them. So rather than getting together with the communities around O'Hare and deciding what was already a city right here off the end of the runway, let us not point a runway in that direction right off the boundary of the airport.

He said what we need is the authority to put a runway anywhere we want to, and the City of Chicago has been pretty autocratic over the years. They have put the runways anywhere they wanted to. They have now two separate airports on opposite sides of the terminal building and they have enough runways to handle all the traffic that the air above the airport can handle. Now, this is sort of typical of what happens where there is a need for an airport.

Now many of the airports which are now small around the United States are expected to grow in the future as airports like Chicago and Kennedy and Atlanta and so on meet capacities. Any expansion in operation has to be taken care of by reliever airports and, since it is very difficult to get a new airport started, these reliever airport operations are going to grow into airports already in existence, where there is a total of one little strip that can be expanded into a larger airport by extending a runway a few hundred feet this year and putting in another runway next year and so on. In each case no great increase in capacity but step by step you make a bigger airport out of it.

Now when we come to studies of airports in general, the attitude of the Federal authorities -- and I sort of point to John Wesler because he represents the FAA, that we can take Congress and any other group and they say if you want to make a study of airport noise and land use planning, let us confine it to the airports that already have a problem. Let us not dig down into a situation where they do not have a problem, because you are going to stir people up and get them against the airport. Now, it is really those airports which have not already used up the land around the airport which could now be planning such that in the future they would have proper use of that land where there is going to be a high noise impact in the future.

Now, I have talked long enough but I think you see the picture that I am drawing. If we are going to do anything that is going to protect us in the

future, we have to do it before the land around the airport is already used up by residential use. So why do we not look at the layer of airports where there's still an opportunity to do something and where we know that in the next twenty years or maybe forty years there is going to be increased operations? Because whatever we do, either on the airport side or on the land use side, becomes very permanent. If you put in a new runway or expand a runway, nobody is going to run in there and yank it out. If some developer gets authority to build houses over a thousand acres that are going to be exposed to high noise impact levels in the future or in the distant future, it is going to be very difficult to go in and yank those out. So why do we not concentrate our planning or at least include in our planning areas that we know in the future are going to be problems and we can now do something about it?

DR. BRAGDON: Taking it one step further, to both you and Chuck, where you add an airport where the problem already exists, what I see here is that we are talking about it from the preventive standpoint, and would there be under the FAA or is there a possibility where the airport does not want to expand necessarily but wants to look at the long-term facilities? Is there that chance? Or is it more oriented toward problems that we know exist and therefore must solve as a priority?

MR. WESLER: Well, typically those priorities are for those locations where problems already exist. It is difficult to get people to look ten years into the future and predict dire things. No one wants to do that, particularly politicians. I agree with what you are saying, John, except I disagree with what you are saying -- that what we do now, particularly on the land side, has a permanent effect. I think you can take a look at any land use zoning around a prospective airport. That is not permanent by any means. But without a question, eligibility and trust fund financing go to the locations where problems are, not where they might be in the future. This may not be right but it is a fact of life.

MR. SWING: It is a question about the allocation of ADAP funds to reduce noise problems. I already warned John I was going to do this. We have a problem in California with the use of aircraft easements or aviation easements. They are sort of a major loophole in our aeronautic standards and they are not well understood. Unfortunately, a lot of times people give away any future rights to recourse to aviation noise or any form of impact when they sell off their rights to an aviation easement. Now the reason I want John to explain something -- I was under an impression that there were some constraints over the fact of Oakland to produce unlimited amounts of noise and other disturbances, unquote, over this certain area where the easements applied. Unfortunately, that gets the Port of Oakland off the hook with our division of aeronautics and now they are going ahead and developing condos and single-family residential in there because it has an aircraft noise easement and it's now considered noise compatible land use. I am not blaming John for this exactly but I am just suggesting -- and he can respond -- that when these ADAP funds are given out let's say as a remedy for aircraft noise problems, that perhaps the conditions of an aircraft noise easement need to be expanded and perhaps some conditions should be placed on them. What is the possibility of that any time in the future?

MR. WESLER: I have forgotten the exact wording, but as I recall the eligibility is for the purchase or financial control over noise impacted

areas as eligible items under trust funding. Let me take the opposite tack. Not necessarily that I believe it but just for argumentative purposes. Noise is a threat to the public welfare, not the public health and, therefore, what is wrong with an easement if an individual feels that his annoyance is worth so much money and he is willing to accept it?

MR. SWING: Actually, our staff psychologist would differ with you, the fact that it is not a health problem.

MR. WESLER: He works for the Department of Health.

MR. SWING: But if it was strictly attitudinal and not at such high levels, perhaps I could agree with you, but this easement allows unlimited amounts of noise -- so it certainly suggests that it could evolve into a health problem, if you define health as strictly violating OSHA standards, or however you want to define it.

MR. WESLER: You have a point there and I would say that also perhaps those people who sold that easement must be awfully naive.

MR. SWING: It was clever.

MR. WESLER: Or uninformed -- Perhaps that is a better word.

MR. SWING: The whole point of this was to suggest that when easements are used as a remedy, they need to be done with a disclosure -- and some form of adequate disclosure. And also it would seem to me to be FAA's, or whoever grants these funds, responsibility to insure that they were used for a responsible purpose; that they did not just alleviate any recourse these people have in the future.

MR. WESLER: I agree with you. I think there should be some safeguard to make sure that people who sell away their rights understand, if you will, what they are doing and know what they are getting into. I am not familiar with the Oakland situation but I will find out.

MR. SWING: I picked it because it is the most outrageous example.

MR. WESLER: Yes, ma'am.

MS. GRINDLE: The audience and you may be interested in knowing that in Orange County recently the board of supervisors approved a large residential development that was within sixty-five CNEL around the Marine Corps Airfield, El Toro. And a condition of approval was the requirement that the developer sign over to the county an aviation easement over all the property. That was later ruled illegal and cannot be done and I support the fact that that was ruled. That would be the developer giving away the homeowners' rights in the future. But the interesting thing about this is the board of supervisors used that as a copout to approve the residential development. It did not change the noise level. In fact, I am fully opposed to aviation easements of any sort. They do not solve the problem; they call it something else.

DR. BRAGDON: I would like to raise one question. There have been discussions today from the people from the Park Service, and Joan Caldwell and

others have suggested that the levels of noise associated with G.A. aircraft may not be in the same ballpark or level with commercial aircraft, but still may be an impact because of the ambient which previously existed. Particularly, a G.A. area may be rural in nature and therefore the introduction of a G.A. airport raises the ambient significantly by virtue of what was previously there. The question I have, and I would like to address it to both John and Bill Galloway:

Is there any merit in suggesting that we look more beyond what we do have now as an Ldn 65 or as a base, to see if we need to protect rural, nonurbanized areas from potentially increasing ambient due to the introduction of a general aviation facility? Is there some merit in there and is that being looked up? I would like to have Bill give his indication based on what he has done, if that is a concern; then John, to see if FAA has looked at it or is looking at it.

MR. GALLOWAY: That is not a G.A. airport problem you are stating, necessarily. It is a question of what the situation is and what is being done to look at the question of superimposing some mechanically induced noise environment on the top of some background levels that are there at the moment. Yes, this is an area of concern of which not too much is known. As you are well aware, most of these facilities surveyed are at higher levels and usually they are places of higher other urban noises. I do not know what is going to happen, but certainly this has been discussed in various NASA circles, FAA and others, and presumably some work will be done to look at these areas in which two things happen. One, you have a moderate, cumulative exposure superimposed on a very low background level, but caused in two different ways. One is a relatively small number of quiet noise events, as compared to the same cumulative measure being caused by lots of relatively low events. We do not know the answer. Nobody knows the answer, but as far as I am concerned that is the basic area that needs to be explored by the responsible agencies.

MR. WESLER: Bill is obviously right. He always is. But everybody keeps coming back to 65. You know, 65 is a generally accepted guideline and I think it is a good one, particularly around the larger airports where most of our emphasis has been placed in the past. It is not a hard and fast standard and we have carefully not, at least from FAA's point of view, tried to say it is a standard. There has to be some judgement used in things like this too and the use of a lower guideline or a lower planning level around more noise susceptible areas, such as general aviation airports, is entirely profitable and should be done. It is a basis of judgement in many cases and it is quite appropriate.

DR. BRAGDON: John Schettino.

MR. JOHN C. SCHETTINO: Cliff, I don't think you really have got an answer to the question. The question should have been addressed to the Environmental Protection Agency whereas in fact has the responsibility for establishing the health and welfare criteria upon which regulations are based. Since the levels document was published, a number of additional questions have arisen concerning what are the levels requisite to protecting the public health and welfare. As many of you are aware, we have a choice of criteria now. We have single event criteria, many of which have been applied

in several of the regulations already proposed. In this particular area, general aviation, we have for over a year now been investigating the appropriateness of existing aviation criteria to the general aviation noise environment. Our Scientific Assistance Staff has been running that program, and I would expect that it would be their plan to initiate some public ordinance resulting from their findings which we in turn would then use to establish the appropriate criteria for general aviation. And I think that is really the only statement that the Government can make at this time. We are aware of it. We have work underway on it and I would be very surprised if Chuck Elkins does not intend for some public discourse to take place upon our findings in order that we can establish criteria for that.

MR. LEWIS GOODFRIEND: I have a question for either Bob Doyle or Cliff Bragdon or maybe both. It is:

After land use planning, what next? How do you achieve implementation after planning? This is the real question that needs to be answered by planners in order to help the people in general on aviation noise field or the air carrier airport field or the land use planning problem area. You can plan, you can have regional plans, you can have municipal plans, you can have city plans. Planners are generally in an advisory capacity to the municipality, to a bank, to a mortgage agency, and it is the municipal government, the municipal zoning board that actually governs the land use in the municipality -- and the courts. Because if the applicant for a particular land use that might not be covered or might not conform does not like the municipality's rulings, they can go to court and try to have them overturned. It really boils down to how. Let us go back a moment.

In each of the fifty states there are fifty ways of enacting zoning regulations, taking advantage of planning, and enacting municipal laws. So how can the planner and the citizen who are involved in these noise problems take advantage of the information to obtain implementation of the good planning concepts? That is one of the things I really feel ought to come out of this meeting, because without that all the concepts of land use planning and general aviation noise cannot really go anywhere.

DR. BRAGDON: Bob, do you want to start off on that? I will chime in.

MR. DOYLE: Okay. Maybe we can put it away. One key you said was fifty laws, fifty ways of doing things, plus added to by all of the local communities. I think it has to be recognized that as consultants across the country, we find ourselves trying to keep track of those laws, those abilities and so forth. In California, in Washington, and in a few other states, a plan that has been mentioned in an ordinance -- the plan itself is an ordinance. Once you get the plan accomplished, you must adopt it as an ordinance and zoning must track that. And there are court cases in those states which indicate very clearly that the zoning must track those plans. The trick is to get the plan approved. In those situations, unfortunately, too often the plan looks like the existing zoning because that is where the property interests and the political interests often lie.

I would say there are many ways of implementation. I would say, start your planning on the basis of where you are going to end up. What can you implement? You know, what is an implementable action: This is why I mentioned that regional agencies that are going to do planning for airport systems or for airport facilities which have no control or authority are not really the right ones to be doing the planning. Now, if you take an organization like the Metropolitan Council in the Minneapolis area, and the Atlantic Regional Commission, they have special legislation, particularly in Minneapolis, which does give them an opportunity to build a system, if you are looking at an airport system. And they have through that Metropolitan Council legislation the ability to veto local plans which are at variance with these metro-wide systems. That is one side of the coin.

At the local level, I can certainly appreciate Mrs. Grindle's position that it is a political decision 99 times out of 100. We are having the same difficulty in the San Francisco situation where we are dealing with nine different jurisdictions, and the jurisdictions themselves -- it is a joint land use study by the nine jurisdictions -- do not want to face up to their responsibilities concerning land use decision. They have not only approved apartments along Highway 101, which happened also to be within the airport's area, but they continue to do so. They feel that everything should be done on-airport. Well, we have looked at it from every way and from every angle, the entire group has, and maybe 80 percent of the problem can be resolved on-airport, but there is still 20 percent that is going to have to be done in the community.

I would like to say that I believe there are a few places around that have done some implementation. I mentioned the Kansas City special zone. That is a zone which is unlike most zoning classifications. It is like a planned unit development process and that process is as follows:

A master plan for the development of for the most part, usually undeveloped areas is put together. Then that eventually becomes the zoning for that area, that is that master plan. And everything that goes on within the area covered by the plan unit development approach has to fit that master plan. Now, there are provisions typically for updating or changing these master plans. The Kansas City Airport special district is that kind of a plan, where on-airport and off-airport decisions are geared to that master plan, which is supervised by the local city department.

There are other forms of implementation. One of them is fairly extreme. A lot of airports have had to do it, particularly major airports where -- with FAA funds and sanction -- where houses are in areas exposed, let's say to 75 Ldn or above and are going to continue to be exposed according to all the forecasts; those lands are acquired and a relocation process comes through. It is a very traumatic socio-economic process. In some cases, it is well accepted; in other cases, it is not. Boston balked, as I remember. Boston neighborhoods balked at the process. They did not want to move.

Another process, but this goes even to the easement -- In Seattle, the area which is above the accepted noise levels now but is expected to be within acceptable levels -- without going into details -- but based on FAR 36, aircraft, changing operations and so forth, the property owners within that

area were given several choices by the Port of Seattle, and I will tick them off.

It was called a Purchase Insurance Area. Number one, if the noise was of great consequence to them, of great concern to them, the Port of Seattle would purchase the property and would relocate them under the Uniform Relocation Act of the U.S. Government, because Federal funds would be used as well as state and local. The presumably equitable settlement would be arrived at by the party being moved in terms of its value. The port would then insulate that house and resell it within an aviation easement attached. It would be insulated to fit the standards, again under the national noise policy of FAA. That was one choice. If noise was of such great consequence to you and your family and your situation, you could get out.

Second choice was that if you really wanted to stay there and a lot of people did, you could get a grant for noise insulation in return for an easement. Now the reason for the return was because they were not certain that anybody was actually going to take the money and insulate the house, for one thing. Plus, there was no guarantee that the property owner would not come back at some later date if there was no easement attached. Now, granted the easement has to be tied to existing noise levels. If those were exceeded, then the easement went out. That was the second choice; you could insulate your property and stay there.

The third choice, and many people interestingly enough chose this, they did not want anybody messing with their house. They did not want any easement. They did not want any insulation. They did not want to move. That was their choice. That seemed to work very well in that community with those citizens because they worked out their scheme to a large extent with the help of technicians, and it was a plan and program then that was implementable by the people who had to make the very two decisions. In that case it was the property owners and residents and that got them completely out of, you might say at least, the political decisions, at least in that area.

DR. BRAGDON: Well, I think the most important thing is that the plan be a legislative document. It has to have legislative standing. It has to be adopted as part of policy by that community. Shirley was talking about the commissioner can decide what he wants to do for that county by virtue of some decision he makes with a friend who is a politician or a friend who is supporting his political campaign. There has to be first of all some legal standing for the document, which is what Bob was talking about earlier. That is extremely critical. Now even in California, to have legal standing, the thing has to be adopted by the legislative branch.

MS. GRINDLE: Three votes change it, and we do it all the time.

DR. BRAGDON: All right. I did not realize it was three votes. But even if it were adopted, that does not assure the continuity. And that is a point I would like to stress, that the planning process is a continuous one and only if there is a continuous monitoring of that process is there going to be assurance that there is the interest of the community being expressed.

We could make the same analogy with noise control laws in the United States, and there are 1,900 of these among cities above 10,000. How many of those are in operation? Very few. Why? The politician wants to get on the books that he is for environmental control and does not put any money in to insure that they be enforced. So the question is not to turn it away from the planner. There has to be an accountability process going on. It takes citizen's groups and, sure, there is a continuity in the terms of mandated authority and enforcement of that authority and that is the thing that concerns me.

There is only one example that I know of where they have actually looked after the case of the economic impact of making a decision and then evaluating it later. What happens in cases, obviously, is the case will be made for rezoning and everybody thinks it is terrific and then two years later they come back and find out by virtue of that decision there is a turnover rate, there is a potential abandonment of that facility and there is a loss in the tax base for that particular use, if they permit it.

What I would like to see is the alternative choice examined. I haven't seen it. I would like to see it tried for the first time, looked at over the long term for the interest of alternative signs for the community in terms of economic costs and economic benefits when the zoning case comes up. It seems to me it is apparent what the advantages would be on a long term versus the short term. And it seems to me that it should be an inherent requirement that the long term commitment to planning must be looking at what the consequence is of decision A versus decision B. And there's no accountability there. I think that is one of the things that the planning community has not done. They have not shown what happens if you make this decision versus that decision, what is the economic impact.

We have a general aviation group here talking to us, saying that the development of an airport will stimulate economic development. We do not have any quantitative cost for that. The point here is that you have got to argue in terms of some hard core data to refute a political opinion that has been expressed by a councilman who says this is in the best interest of our community. The citizens do not ask for this but I think they should demand that kind of decision making.

MR. WESLER: I think all we can do is close and say implementation in a democracy is very difficult. It typically involves compromises and as a young man twenty years ago I had to get used to that. The only thing that helped me out along the way was what Churchill said, that democracy is the worst form of government that we have except all the rest. I happen to believe that. This is a democratic situation and everybody is involved in this, the plan that comes out of these efforts -- with heavy citizen involvement, with heavy management involvement, with heavy federal, state and local agency involvement -- will be a compromise plan. It will not be everything the citizens want; it will not be everything management wants; it will not be everything the FAA wants; it will not be everything the consultants want. I happen to find that works pretty well. It does not give perfect solutions. I have not seen very many of those, but it works better. As Churchill says, it works better than anything else.

ATTENDEE: I would like to comment on what has gone on in the last couple of speeches. You know, Lou, your question implied what goes on after the plan and then the response we heard was the plan is a continuous one and it is a continuing, ongoing one, and I think that is the difference in concept. If you had a contract to do a plan, you finished it. There it is. It is a piece of paper. But the plan should have included a strategy that had some implementation in it. And I think the two elements that I heard and part of the plan is that it had a public persuasion element to it and some kind of enforcement credibility or accountability.

The persuasion element could include, for instance something like Torrance's news letter to inform pilots. It could include signs like those at Buchanan Field that the pilots can read as they are approaching the runway. It can include, like Orange County's, inserts for the aviation manual. It can include regular announcements to the press, or whatever, a lot of other things. But there has got to be a public persuasion element, and I think that applies to surface transportation in other areas as well.

And that gets into the fundamental issue that is still a continuing resolution in the courts between local and federal issues, but if you are just keeping statistics on what aircraft are flying and what is happening, just the number of operations; if you do not get hard data like Cliff was talking about, at least it is playing on something that is giving the public some sense of credibility in understanding the problem.

MR. TYLER: During the last two sessions of the legislature there have been bills in Congress to provide ADAP funds for airport land use planning and for land use change. Now, these bills have essentially been designed by ATA, which works very closely with the Aviation Subcommittee of Public Works. The bills are designed to benefit the air transport system. They would provide funds to airports which would be used to draw noise contours for the condition at the present time, also for 1985, and then have public hearings with communities around the airports and work with the communities around the airport to develop a coordinated plan, taking into account the future plans of the airport and also the present and future plans of the communities. Now, there are funds available for that sort of thing right now. They are on an 80/20 basis. The ADAP funds pay eighty percent of the cost and the local airport twenty percent of the cost. In most cases the airport does not pick up those funds because there is no real reason why they should plan with the communities around the airport. Why pay for that twenty percent, even though it is a small percentage, if you do not have to spend anything?

I think people living around airports should be aware of this sort of thing that is going on in Congress and they should ask that this kind of program be made mandatory; that any airport that receives ADAP funding for any purpose make a plan showing what the noise impact will be, what it is now and what it will be in 1985, 1990, 1995. Under the present circumstances, with the change in noise characteristics of the airline fleet over a period of ten to twenty years, we know what the noise levels and what the noise impact will be so that these contours could be drawn, the communities could be advised as to what the airport planning is which would make it possible for the communities to coordinate their plans.

Now, I believe that communities around airports should get together, work on their Congressmen to make this sort of thing mandatory rather than voluntary on the part of the airport. And I know there are communities all over the United States that work in connection with the impact of noise on their community, but they are so fragmented that they have no impact on the Congressional legislation and I think this is one of our real problems. The industry -- ATA is a well organized -- a \$20 billion a year industry. They can lose a few \$100 million in their lobby in Washington and never miss it, and they do a very good job of lobbying -- which you would expect. But the people of the United States have to get together and let their Congressmen know what their needs are, and if they do so I think real improvement in the situation could be brought about by requiring that these plans be developed.

DR. BRAGDON: Chuck, you had a comment.

MR. ELKINS: I have a comment and a question on a different subject. My 60-second comment is: I am much more cynical than most of the other speakers. I think maybe it is the job I have. I feel the sooner we come to grips with the idea that money is going to have to change hands and hopefully not the way Ms. Grindle suggested, but money to buy the rights for development, rights for some other type of -- not an aviation easement but some way to change the land use of the property. The sooner we come to grips with this problem the sooner we are going to solve it.

Sure, some communities solve it by the legislative point zoning plan -- which lets the citizens enforce it by watching closely. But as a general rule, I think we are going to have money spent to buy up the land, buy up the development rights, and I think that is going to take two things. It is going to take a coming to grips with the problem on the part of the aviation industry that they have to pay all the costs of their industry and not expect society to carry it. To the extent that we think that airports are a general good and we should promote airports and not make those who fly pay the whole cost, then it ought to come out of the general treasury. But to ask it to come out of the hands of those people who own land is, I think, in the long run foolhardy because they are going to put all the pressure, they are going to have lawsuits, they are not going to stick with it. And by and large we are going to end up with the impacted airports again.

Let me ask this of Lucie Searle. You thought one thing you could get some help on in your state is for the FAA to help with enforcing operations control.

MS. SEARLE: You mean at towers? No, I said we have gone through this with them and they will not enforce. We accept that. We think they can do much more to inform and remind pilots that such and such is in effect. You know, someone wants to make a departure and requests a certain runway, and they say yes, please maintain a heading for noise abatement such and such -- or please make a -- we don't get the cooperation we want.

MR. ELKINS: Why do you say you accept that they do not enforce it? We expect local communities and states to come in and enforce Federal rules.

MS. SEARLE: I think you should pose the question to them.

MR. ELKINS: Just so we have John answer that question.

MS. SEARLE: I think their rationale has been that these are local rules and it is up to the local management. They concur with them -- they are fine from the safety standpoint, yes, reasonable from the FAA's point of view, but they are your rules and you enforce them.

MR. ELKINS: Well, when the local governments tell me about Federal rules, I give them a speech about I did it for you, we are all in this thing together, why don't you help me out because I don't have enough resources to do that. And I expect them to say, I am a good citizen, I will help out, why doesn't the Federal Government help out too?

MR. LEWIS: Concerning these FAR regulations of the FAA, I have a question on whether they could make the noise and safety regulations or anything carry penalties, and a flight controllers' answer to me on the question of the pilot, as to what would happen to him if he violated the noise breaker regulations at Kennedy Airport sums up the whole thing. The controllers' answer was: A slap on the wrist with a wet ruler. Now, when the FAA puts in monetary penalties or threat of lifting a pilot's license for thirty days or something then we could see good noise abatement as far as procedures, runway use is concerned. As long as it is the way it is now, you are going to find an awful lot of pilots that are just laughing at everything.

MR. WESLER: Violation of a FAR is punishable by a \$1,000 fine for each violation.

MR. LEWIS: Okay, John, why is the FAA so averse to using that then? I could give the Eastern Region at least 150 violations. I would like to see these pilots kept from flying. I will get together with you and I will give you other things and let us get these guys.

MR. WESLER: I think an interpretation of what is a violation is kind of broad, Joe, but there are penalties. These go far beyond, of course, just air traffic control FAR's. Our administrator has attempted to get these raised to \$25,000 per event, for reasons other than ATC. Why don't we enforce local regulations? In many cases, we do. In many cases, the local regulations, in terms of departure headings, departure routes are enforced if they are not at a legal level.

MS. SEARLE: At none of the G.A. airports that I work with will these pilots enforce our locally adopted rules. We have discussed this many times with our regional FAA office and the most that can be approved is for them to be willing to be informed when time and personnel permit. And unfortunately -- I really hate to say this about your business -- I have gone in there many times, in a number of airports, and have really tried to give them clues and say are there any noise abatement things in effect here, or is there anything we should use. And they will often say: Well, say you have a right or a left-hand turn in effect, use whichever you like when it is clear, but by giving off either a right or left-hand turn we would avoid a residential area.

MR. WESLER: I can only guess that most of the occasions you are speaking of are VFR, visual flight regulations, and all air carrier operations, IFR --

MS. SEARLE: Now, back to G.A., I would guess it is because these air traffic controllers are not really demanded to do that. Well, is there anything your office can do to get them to play a bigger role here? Maybe we are not talking to people high enough.

MR. WESLER: I suspect if you talked to Bob Whittington in Boston you would get some better answers. And insofar as getting more air traffic controllers --

MS. SEARLE: I don't think we need more in many of these places. I think it is just a matter of working closer with the management.

DR. BRAGDON: Yes. I think it would be good for that to be handled outside. I am trying to raise additional questions that other people might have that have not had a chance to speak.

MR. WILLIAM J. CRITCHFIELD: Commenting on Mr. Tyler's suggestion that funds be provided to develop contours for airports in terms of general aviation, we provided our own funds to develop the contours. And we discovered or the community suggested that rather than adjust the land use to meet the contours, they adjust the contours to meet the land use -- which we are doing at the expense of aviation.

To comment on Jack Swing's offering on the Oakland matter, it occurs to me that when you purchase an aviation easement you are paying the owner of the land for the decrease in the value of his property because you are going to use it to make noise over it. Therefore, the planning body should recognize that and should deal with it in terms of the permitted uses.

A comment on the air traffic controllers. In terms of their making any enforcement of local regulations for dealing with aviation noise, the air traffic controller is in the forefront; he is the point man. If we cannot have his cooperation and assistance -- We do not need his enforcement, just his cooperation and assistance -- in dealing with the noise problem at local airports who have local problems, then it is practically useless to have an effective program for dealing with noise abatement. It then degenerates into a, quote, gotcha game -- and you can waste a lot of time resources and efforts in playing gotcha. Thank you.

MR. RANDY BARNES: Randy Barnes, City Planning Program. One of my concerns has to do with environmental economics and I would like to address both Mr. Elkins and Mr. Wesler. It seems that the rising cost of energy has increasingly caused the political area to re-evaluate environmental legislation. It is already on the books. There has been talk about relaxing air quality standards, for example -- in particular, to allow more sulphur-content coal to be burned. Along those same lines, the rising cost of energy is also impinging upon the commercial aircraft industry as well as the general aviation industry. The rising cost of jet fuels is expected to double or triple within the next year or so.

My question is, how would this matter, especially as an aviation lobby, affect the outcome of noise abatement criteria within EPA? At the same time, I would like to ask the FAA if this type of economics allows them to reappraise angles of ascent and rates of ascent and rates of descent over busy airports? In other words, it is a logical assumption that the lower the rate of ascent, for example, the lower the thrust -- especially with jet aircraft. So if you have a 15 degree rate of ascent over a residential area, you are going to be impacting for a longer period of time over a longer distance of residential community and more residential neighbors. So with that in mind, I would like to know whether or not this kind of economics is having any play in the affairs of both airport management and the decision to establish noise abatement criteria.

MR. WESLER: Well, so far, the rising cost of fuel is probably the best friend that noise abatement ears have had in a long time. It comes about because most of the newer aircraft combine both less noise and better fuel efficiency. And if there is any drive that will bring an aircraft operator to a new aircraft, it is the cost of operating that aircraft, not necessarily noise. So particularly in the jet aircraft, and particularly in the air carrier jet aircraft but also in regard to the business jets, the newer aircraft are both more fuel efficient and quiet and the fuel cost, if nothing else, is driving the operators to the use of those aircraft.

Now, there are other things that we are doing in order to save fuel, from a national point of view. One of these things is maximum descent, for example. You mentioned this. By descending from cruising altitudes almost at flight idle, this is saving fuel and it is a quieter approach, although most of the quiet, of course, is at 39,000 feet, below which it does not make that much difference anyway. But in effect, so far, the rising cost of fuel has not been contrary to noise abatement.

Now it comes into account and it does come into conflict in certain specific instances. One of these is in Boston, for example, where the departure route from one runway there, 22-right has become quite a controversial thing around Boston, routes would be to depart and quickly turn left and, essentially, do a 360 degree turn and back up and over the airport and head west over the airport. This is also the most fuel-wasteful of the various alternatives which were analyzed for 22-right departures at Boston. And so you have a conflict here, a direct conflict between potential for fuel economy and noise abatement. And the balancing of these, along with many other items, is a very difficult judgment to make. It is a judgment and it is a judgment that will be made by different people representing different interests. It usually falls to the FAA to make the judgment and, rightly or wrongly, we make it. I think it was Secretary Bill Coleman who used to say that you are never going to please everybody. Probably your best decision is that which makes both ends of the spectrum equally unhappy. So I guess that is our criterion.

DR. BRAGDON: Any comment from EPA on the issue of environmental energy legislation?

MR. ELKINS: Just very quickly on this. You used the word criteria. I cannot. We always make the distinction between what on the one hand the health effects are and what science says on the one hand and, secondly what

the final decision should be. I can assure you that our assessments, then, as they affect health and welfare, are very well thought out, are not influenced by cost, energy or anything like that. But when it comes to making regulatory decisions, we spend much more money figuring out what the economic impact of our decision is, including energy, instead of health and welfare because that is where the politics are. So our feelings are you put it out on the table so that everyone knows what you are doing.

What happens at the economic end -- When manufacturers are looking at new aircraft they seem to be very inclined to worry about range, payload, and now energy. We have not seen a great deal of inclination that aircraft designers build in noise control as one of the major considerations. It always seems to be the afterthought -- well, let's see now. We have got this airplane and we surely want to fly it at this speed. Now let's see how we can make it a little bit quieter and, of course, you have already made those design decisions that keep you from having a quieter aircraft.

So I think energy and economy are the current reasons that people give for not doing what we think maybe they ought to do. Next year it will be something else. That does not mean that we do not give a hoot, certainly; but I think part of our job in the EPA is to try to put it in the right perspective.

MR. KENNETH J. DELINO: My name is Ken Delino, Systems Control. We have done these noise control and also noise abatement programs across the country. We have found the airlines have been in the forefront of noise reduction by reducing the fuel consumption. Most of the major airlines also have given to each of the pilots a program-learning document on how to save fuel. These include idle-thrust approaches with depressed flaps. In fact, Northwest Airlines stops the flaps at 35 degrees and on takeoff thrusts by up to five to six percent, to save not only fuel but also engines. And we have measured up to 10 dBA differences on this.

What actually caused us to look into it, we saw the 10 dBA differences and then we found the program-learning document that each of the airline pilots get and the airlines are computing a savings of up to \$10 million a year by saving fuel and also reducing the noise.

DR. BRAGDON: This is a secondary benefit.

MR. STANLEY GREEN: Stan Green from GAMA. On this same point, I would like to point out to Mr. Elkins that the Concorde, which is not a general aviation aircraft, obviously is a '66 design. We didn't consider noise at that time. Today, noise is a prime design parameter, has been for some ten years. And while you may not sit at the table, I think if you will talk to the people you will find that it is a key design parameter. Noise is an impediment to sales and we do not like things that do not sell.

Another point -- and I bring this up because of the question that was just raised on the energy issue. Yesterday, I had a bit of a conflict between GAMA and FAA on the question of noise versus energy, and there is a conflict there in some of the cases. We've received permission from FAA to establish a limitation -- and I will discuss this in my paper Friday in more detail --

limitation to so-called maximum normal operating power which will achieve through operation a legally enforceable operating limitation on the airplane over and above what they are making today. Those that meet the requirements will be from 4 to 9dB less in noise than they are right now.

Yesterday, there was a meeting going on at GAMA offices between FAA and GAMA on ways to conserve energy. One of the programs that was being worked on was how to get the airplanes to get more miles to the gallon. Unfortunately, one of the systems that was being proposed and apparently generally agreed upon by both sides, were some climb profiles and power scheduling that would wipe out at least part of what we hope to gain from the noise side. So we do have some problems there. In effect, what I instructed my staff to do was get on the computer, see where we can make the best compromises with respect to fuel and noise, take the least dB cut that we have to from the gain that we intend to make, and maximize the energy conservation.

We have two national goals. They are in conflict. Anyone here that says that we should forget the fuel and worry about the noise is as much wrong as someone who comes up with the alternative. Don't kid yourself, we are not going to waste the fuel to save the noise, but we are not going to make more noise to save the fuel. We have got to figure it out. It is a problem and there are a number of other areas along the same line.

The same in the jet aircraft -- Using flight idle or close to it has some problems too, as I know John knows. The guy who never heard it thirty miles out is now getting a little bit of it because the bird is lower than it used to be. Well, we have to work together. You cannot ignore one in favor of the other.

MR. TYLER: May I comment on that one? With regard to this, we are now discussing operating procedures to reduce noise and, as Mr. Green just mentioned, there is a noise reduction takeoff procedure, originally developed by the Northwest Airlines and later approved by a resolution by the Airline Pilots Association, which is the best noise abatement procedure. I might mention that Bill Sperry wrote a paper which was published in the Institute of Noise Control Engineering Magazine and I may want to include that in the documents available for this meeting. In that, Bill has described all of the six procedures, using three different kinds of aircraft and from the size of the footprints produced by a takeoff and landing by these aircraft at both maximum and minimum weights. So, it is a rather comprehensive study and shows the benefits from a noise standpoint of using these different procedures.

I might mention that the Northwest procedure is used completely by Northwest Airlines and is also used by North Central -- which now has a different name.

DR. BRAGDON: Republic.

MR. TYLER: Yes, and most of the other airlines use a procedure, which is labeled ATA, which does not have noise abatement in it. Now, let me mention that noise is a function of thrust reduction. Jet engines are certificated by the FAA with two ratings. One is a takeoff rating, which is limited in time and is used by aircraft operators during takeoff and initial climb. Another is well-called a continuous rating, which is a maximum that

can be used beyond this limited takeoff period. The ATA talks about a thrust reduction, but it is a thrust reduction to climb thrust, not to a variable load thrust, which therefore has no noise reduction involved. And as Bill has pointed out in his paper, it is possible to make a greater thrust reduction if the airplane is light than when it is heavy. And in order to follow noise abatement procedures and get the most out of it, the pilot has to determine what thrust pattern he will use with his thrust reduction after he has completed the ground roll, initial climb, a period of acceleration and climb in which he reduces flap as quickly as possible to get to zero flap and then, under those conditions, make the thrust reduction.

MR. CAMPANELLA: I have some comments that I want to give in this general area also.

MR. TYLER: This procedure is not used generally by airlines. I happen to know in particular that Delta does not use it. The pilots are not aware of the procedure's being available and I know there are several other airlines that are in the same position. But this is because the pressure, the educational impact, has not been brought down to the pilot level at this time.

MR. CAMPANELLA: Most of the hard core data we know about has been developed in respect to air carrier aircraft and we appreciate the fact in general aviation that that has given us a beginning. But if we only focus on that, we are going to miss what we are trying to achieve. The land use and traffic control varies from airport to airport and there is a much greater variety of general-use airports than air carrier airports and we have a much broader problem than air carrier airports do as far as finding a solution for a small body of people like this to work out.

For instance, I believe that most of the general aviation noise is in the five-mile radius doughnut or pillbox called the air traffic area, ATA, that every pilot knows about. Some people call it by the misnomer, control zone, but that is the ATC, Air Traffic Control, and in that situation there may or may not be a tower there, or the strict definition is that there is a tower. Still, the size of the box is where all the problems lie. If there is a tower operating, then you say ATC said do something about it. You are speaking only of a tower operator, not of a radar person vectoring an aircraft.

There is one device called a visual approach slope indicator, or VASI, which helps on landing. And this is very common knowledge among pilots now that you should use this when you are approaching an airport because it keeps you in a nominal slope.

Finally, the jet aircraft, the jet takeoff is the worst offender as far as we are concerned, the biggest single impact, and it is the most difficult to control and it can occur at non-tower airports. So if we are going to talk about jet aircraft, that is the only type of thing we should be concerned about.

MR. LEWIS GOODFRIEND: I have one last comment. To answer the question about the airport developer having a hidden plan which will nibble away at the environment, that can no longer really happen with the implementation or with the adoption of an FAA environmental document. I

believe it is 1050.1C, and I believe it has just been issued. It has a statement in it and it was issued in response to a CEQ requirement. It specifically states about the long-term plan, not just this 700 of runway or this additional taxiway or that additional apron, has to be covered by the Environmental Impact Statement, but the long-term development has to be examined along with the request for funding the EIS for the particular piece of activity for funding that they are looking for. I think that this is one of the good features of that document. There are some others that I am not as enthusiastic about.

MR. WESLER: What noise office?

MR. GOODFRIEND: Your noise office, Mr. Tedrick's Office.

MR. WESLER: It is not out yet.

DR. BRAGDON: That is one of the problems around airports. When you talk about compatibility, its incremental growth, what happens this year, is not a big problem, just a small runway extension. And what you are saying is if that small runway extension runs at a parallel across, then you have a problem on your hands and that has been one of the problems the planning group dealt with -- incremental analysis without looking over the total plan.

MORNING SESSION

October 4, 1979

9:10 o'clock, a.m.

DR. BRAGDON: The first presentation this morning is by Lewis Goodfriend. Lew is President of Lewis S. Goodfriend and Associates in Cedar Knolls, New Jersey. Lew has been in the business many years and has established quite a reputation in the area of community noise and environmental noise and has been involved in all aspects of it over a considerable period of time. Lew's presentation will deal with remedial measures dealing with noise associated with G.A. activity.

MR. LEWIS S. GOODFRIEND: Thank you, Cliff. Good morning. It was a pleasure yesterday to hear some people describe some case histories of airports toward remedial measures. I was particularly interested in what Lucie Searle and Joan Caldwell had to say, and you did hear the kinds of problems that we run into when all you could talk about was planning, from Shirley Grindle. I do not plan to go over that kind of territory in detail. In fact, I think I can limit my talk by telling you some things I am not going to talk about.

I am not going to talk about fighting the aircraft. I am not going to talk about how to change the zoning because I don't know how to make people change zoning. I wish I did. I am not going to talk about how to fly general aviation aircraft. I am not going to discuss the two-segment approach for business jets, things like that. I think that can be discussed by others. And I am not going to talk about the kinds of solutions that could be considered under ADAP's program quite a few years ago from the Federal Government which resulted in how you reduce the impact of noise in communities around carrier airports by doing things like sound-proofing houses or the like.

I would like to address the problem of how you implement some of the communications and how you cover some of the problems of communication between airport people, airport operators and the community. I am going to cover a lot of old ground, but let us see if I can emphasize it and systematize it so it will be a little more useful.

The first step in remediation is the identification of the nature of noise impact in portions of the surrounding community for which the noise problems exist. This first step in the problem itself may be the major step in remediation. The use of conventional noise descriptors to try and describe the impact does not appear to be suitable for general aviation noise assessment. One of the problems in applying such noise descriptors is different operations at the same sound level cause different responses or at the same descriptive level.

Flight tracks vary widely for the same category of aircraft over a point or a radius from the start of roll or from the midpoint of the runway. You pick the point where you want to measure and the aircraft will not fly over it. This will yield a large spread in your measured ground level and the community response appears to occur as a complex function of flight frequency,

maximum level, duration above ambient, and visibility. This has been confirmed to some extent by the study done by B. B. Andrew and reported by Andrew Harris in their work for the Massachusetts Aeronautics Commission, and also by some work that was performed by my associates in some airports, Morristown Municipal and some other nearby airports.

In one case, the noise occurred only when the aircraft land at night and we discovered that the neighbors only complained when the aircraft landed with their lights on before they got over the fence. If there are not lights on the aircraft, until the aircraft is on the airport property there are no complaints. So that may tell you what the neighbors are complaining about.

If you consult Harris's paper, he says that cumulative aircraft noise near the ambient or other noise resulted in concerted community action. He goes on to say that these airports were all in relatively quiet areas. Serious complaints and concerted community action occurred with aircraft noise levels in the range from Ldn 50 to Ldn 55, levels far below current official standards of acceptability. He also touched on touch-and-go flights, and said the complaints about touch-and-go flights did not occur when the levels of exposure, due to touch-and-go flights, were below Ldn 50 but occurred on a regular basis when exposure exceeded Ldn 50.

We have run a number of calculations as to what happens when you have a change in Ldn of 5. At an ambient sound level of Ldn 52, 30 aircraft operations with SEL's of approximately 90 -- and these are light aircraft -- during daytime hours only will raise the Ldn to 57; however, with a site of an Ldn of 56, 76 aircraft operations with an SEL of 90 are required to raise the Ldn by 5 dB, or 37 with a SEL of 93.

What I am saying here is that the descriptor is sensitive to level itself, and the number of flights will vary from -- the levels that Harris was talking about were a little above. We are talking about the kind of activity you get with touch-and-go traffic mixed with departures or landings.

It is probable that a careful record of community complaints is the best indication that there is a general aviation airport noise problem. Serious noise problems can be monitored using conventional level monitoring equipment, but the use of such data to predict impact could probably best be done on a specific runway on the basis of local community noise response information.

The first slide, please.

In order to relate airport operations to noise impact, detailed information on the individual general aviation airport is necessary. This information -- some of it is not too easy to get -- includes size, what is the area covered by the airport, what are the runways; physical relationship of airport and noise-sensitive areas; what is the traffic volume. Just try to find out from your local FAA tower about what the volume of specific types of aircraft is. It is not that they would not like to help in most cases, it is that they do not keep that kind of detailed records.

Traffic mix for prop only; frequency of the jet traffic; fixed base; activities, especially static engine runups, and finally the actual runway use do not give us the windows and tell us what is covered 90 percent of the time. What is the actual runway use? You may have to go out and spend a year taking physical measurements and aircraft counts to find out what the facts are. With this information in the complaint records, it may be possible without any further acoustical information at all to estimate the noise impact on surrounding areas. Add to these data ambient noise levels in the area and the actual predicted noise levels of the noise sensitive locations and you probably have the point of the problem. The next slide, please.

With respect to jet traffic, it appears that there is no simple relationship between frequency of flights and annoyance. Community responses do occur in two distinct steps. I don't think there is a continuum of response to jet aircraft traffic if you have awareness of it. You know that there is a jet aircraft that has gone overhead. You have annoyance because there are several flights and it may distract you in your fear of some activities. Then you reach a level when you have group action against the jet flights, and I think from Bill Galloway's charts that we saw yesterday, you might be able to make some predictions as to where these break points occur.

Slide, please.

It is clear from this preliminary discussion that there are few functional relationships to guide as in the assessment of impact of general aviation airport noise in the surrounding community. However, the remedial measures available are also discreet in nature so that we are not faced with measuring a small change in noise level or impact. If we cannot make a change equivalent to a 5 or 10 decibel in level, we will see no change in community response. Now, there are several generic types of remedial measures. These include political, regulatory, operational, economic, and community relation measures. I will go over these in detail. Some remediation is accomplished through a combination of these elements and maybe all of them.

Political solutions are those which result from actions by municipal bodies, such as the governing body or the planning board action, which deal with the zoning of properties around the airport on the basis of a one-time local or regional plan -- is an example. Such political solutions are seldom feasible today, particularly in the northeast because master plans have been adopted and changing them may create hardships and inequities that result in litigation. The partial solution is the purchase of properties that are or will be impacted by airport traffic, but even such land purchases can lead to litigation. However, land use planning is a continuing process and must continue to be a major element in individual airport planning.

Other political remedies involve landing fees, hangar rental, and the rate of development of the airport in view of its attractiveness to both based and itinerant aircraft.

Regulatory measures include those activities which are under the control of the airport management. These include noise limit monitoring locations and the use of curfews on aircraft not meeting published noise level standards.

Operational measures available to the airport operator include the publication and use of a preferential runway system, the use of noise abatement flight procedures, and the identification for pilots of noise sensitive areas. Of course, for single runway airports the preferential runway idea is not much help; however, flexibility in the assignment of departure times and close cooperation between FAA tower personnel and the airport management can reduce the impact during high density traffic periods.

For smaller airports, touch-and-go traffic may all occur near or over residential areas. It is here that attention needs to be given to the place of flight training in the airport community relationship. It may be that airport operators will have to decide whether business traffic and aircraft maintenance activities are more important than flight training and hangar or tie-down income. It has occurred to many in the general aviation area that some tradeoff in this area may be in order. Just turn on your radio on some clear Friday afternoon and listen to the combination of student pilots, business twins, and high performance jets all in the same traffic pattern. The combination of regulatory and operational measures has been adopted by some airports.

The next slide, please.

This requires the filing of application by those wishing to operate turbine-powered aircraft into the airport, and also requires that certain procedures be followed during landing and takeoff. These procedures are published in some cases in Jeppeson-like pages, and you see this is just a piece of the page from the Teterboro product that Frank Gammon is going to talk about later. I don't want to give his talk, but it shows the instructions on the front side and on the reverse are detailed operational instructions for the noise abatement program.

Economic remedial measures include incentives for major corporations to maintain a good-neighbor image by minimizing their fleet impact in the neighboring community. This requires strong motivation to operate quietly and to upgrade the fleet with quieter aircraft. Another economic aspect of remediation exists when the impacted community includes members of the owning company staff. I should also mention that economic remediation is available through Federal agencies like HUD, which has developed criteria for land use for HUD-supported projects, whether they are guaranteeing the mortgage or putting up the money. You must file an appropriate environmental impact statement, including the noise, and they have some explicit noise criteria. Of course, appeals to HUD officials can sometimes get them bent a little bit, but generally the standards are pretty well met.

At some airports the management works closely with the neighboring communities to pinpoint those operations that appear to have the greatest impact, and with the cooperation of the FAA personnel implement noise abatement plans such as the one you saw. Also, corporate pilots have joined together in formal organizations at some airports, and among other activities work toward noise abatement and improved community relations. This may include and assessment of operational procedures for noise abatement, involving turbine-powered equipment noise as well as participating in community activities. It has been known for many years that noise annoyance

activities. It has been known for many years that noise annoyance is increased by the belief on the part of the auditor that the noise is unnecessary or can be easily abated. It is also known that good community relations are worth up to 10 dB of noise reduction. With this in mind, it is clearly important for airport managers to work at improving community relations.

Programs which identify communications cause for complaints, follow-up reports on complaints, and disseminate information on studies, programs, and actions taken to improve the noise situation are very important. This is not issuing press releases but meeting with elected officials in the neighboring municipalities and community groups and bringing in the pilots' organization and FAA staff where they can hear the problem at first hand, discuss the operational aspect, and then discuss the potential measures to reduce the noise impact, those in the near and long-term future. There are some problem areas though.

Next slide.

There are some problem areas where the ideas that have been presented will not be easy to implement. These include airports in one municipality that are owned by another governmental entity, such as an adjacent county or a quasi-governmental authority. There are airports on the edge of one municipality that cause noise problems in another municipality. There are suburban airports initiating turbine-powered activity and there are airports opening new fixed base jet maintenance facilities. Nevertheless, programs for remediation should always be available to each airport manager.

The next slide.

It should be operative before any complaints occur, probably long before a new airport or facility is opened, and it may result in never having a serious noise complaint -- not most of them, but the most serious. Such a program would include preparation of topographic maps and area photographs with the expected traffic patterns overlaid. That Morristown Municipal Airport, when they applied to extend the runway, they had no off-airport topographic information in the application or the master plan. It did not show -- also, the application for the ILS, which was part of that -- nowhere was shown the fact that south of the airport on the runway extension there was a hill 165 feet high, that FAR-36 measurement. And on top of that 165-foot rise were trees about 150 feet tall and a pair of church spires. And number one, the back court at that airport, is unusable. It is proposed that it would be used. It is unusable and the departing jet aircraft were given a heading of 20 degrees east of the runway center line extension to get them over that hill without the possibility of their going through the church spires. So, topographic map and aerial photographs are really imperative and off-airport information is imperative too.

You need to delineate the noise sensitive areas. You need to list the airport telephone information numbers. Who do we call if we want information or have to report something? What happens if an aircraft lands in your back yard and it is a terrible thought that there might be an accident, but how would you call? It may not be as bad as that. Noise complaints may

not be as bad as that, but if we do not know who to call for noise complaints, you might not know who to call for the others. You should have available instructions for recording complaint information by the FAA, the airport management, the police, and the municipal officials. If they do not know what to do with a telephone call, the management is in trouble.

You need a noise coordinating committee to review operations, recommend noise abatement procedures, and assess complaints from an operational point of view. You need to issue noise abatement procedures if they are required to be and can be used. You need regional information and you need education. You want to get out in the community and explain what you are doing openly and explain how you are going to cope with any potential noise problems.

You need the cooperation between the airport management and the local governing bodies and planning boards in order to achieve long-term benefits from land use planning. If you do not have any cooperation, all the planning in the work is not going to offset the attitude of the governing body or the county governing body or the State -- and they are the only people who make the laws.

And you need to review the FAA documents and the environmental requirements for airport development. There is a wealth of information available and sometimes FAA tower personnel are not familiar with the latest output of FAA questions.

Finally, you need an annual review of all of your programs. There are no breakthroughs. There is no state of the art methodology in remedial measures for noise control. As Joan Caldwell said yesterday, have face-to-face conference table meetings, not lectures. It takes hard work, and probably very hard work by volunteer community associations and citizens to help solve the real problem.

I want to take another couple of minutes to tell you about planning at the local level. I have been a consultant to a local New Jersey planning board, industrial and recreational development they have been involved in for many years. The planning board has been considering an application for certain industrial activity which is carried on out of doors. I don't want to get too specific. There probably is going to be litigation over this before we are finished. The planning board has been meeting and I have been meeting with them and hearing evidence from the applicant, from the objectors, from the town engineer for months -- two or three nights a month. Less than a week ago the municipal governing body made the particular industrial operations illegal in any area except the industrial zone, so that you cannot even get a variance, which is what this planning application involved. You cannot even get a variance to carry out this industrial operation in this municipality. The planning board has been meeting. The municipal body knew they were meeting and yet they waited and waited and one evening last week they just made it illegal.

Now, this is a continuing problem for those who are planning professionally. I think the city planners, urban planners, regional planners

must come to grips with this problem before you can have good remediation or good initial planning. I do not want to say too much more.

DR. BRAGDON: Tying in with the overview which Lew has given, we wanted to give you a specific case study and we have a very qualified person to do that. Bill Critchfield, who is manager of the Torrance Municipal Airport in Torrance, California, has had considerable experience and has initiated, I feel, some very innovative things which I feel will be useful for us to examine.

MR. WILLIAM J. CRITCHFIELD: General aviation as a mode of transportation has come of age. Unfortunately, this convenience and sophistication have developed additional problems which plague general aviation. Most airports which make general aviation a convenient and efficient method of transportation have two things in common; they are located in a crowded urban area, and they are heavily used. The Torrance Municipal Airport is no exception. It is located in the South Bay area of Los Angeles County, serving a population in excess of two million. It is also about the twelfth busiest airport in the nation. The airport was developed as a flight strip by the Bureau of Public Roads in the late 1920's. It was transferred to the U.S. Corps of Engineers and developed as a fighter strip in the early and middle forties.

It was acquired by the City of Torrance in 1948. At that time, the airport was surrounded by agriculture, oil fields, and some industrial use. The community, now the City of Lomita, to the east was mostly agricultural-use and residential lots. The airport and its surrounding community remained in this general land use pattern for ten years. In 1948, the City of Torrance took action to develop the airport to meet the growing need for general aviation. Over the next five years the control tower was constructed, the second runway was built, taxiways, parking aprons, lighting, and hangars were constructed; concurrently, housing and apartments were developed around the airport.

The objections to aircraft noise and conflicting land use patterns first became evident in 1965. The City of Torrance started its remedial measure at that time. This dealt with land use. The area immediately west of the airport had been permitted to develop with poor quality housing for single families and multiple-family residential use. This is the area that you see to the left of the screen. Many of the houses were freeway move-ins, displaced by freeway right-of-way acquisition and relocated. In order to protect the airport, the City of Torrance initiated a Federal Housing and Urban Development redevelopment project to convert the residential land to light industrial.

The project amounted to \$7 million on the one-third matching grant, loans, and local funding basis. The original project converted residential uses impacted by airport operations to light industrial, office and commercial uses that were compatible in this area, and in five instances created light industrial office use with direct access to the airport. Today, it is an example of effective redevelopment.

Another project under state guidelines, using local funds, will take place immediately north of the existing Meadow Park Redevelopment Project. Part of the problem we had in that was we applied to the Federal Aviation Administration for funding for an approach protection zone and found out that the cost on that little piece of land, about 56 acres, was about the equivalent of all reliever airport monies for the State of California.

In 1965, the city took other land use measures which continue to be utilized. These are the acquisition of aviation easements which require height limit, grant the right of flight and, in some instances, require acoustic treatment. Aviation easements are obtained both as deed restrictions on tracts for new development and as a condition of land use changes or modifications such as conditional-use permits, lot splits and other land use modifications.

Acoustic construction is also required for new structures having critical uses in the commercial industrial areas. This includes the hospital and medical facilities which require low interior noise levels. Believe it or not, I have a hospital right here (indicating). Now, that may not seem to be quite the thing you would think about near an airport, but my avocation tends to have me spend time in the orthopedic ward on the fourth floor, and my doctor always says: Oh, you want to be overlooking the airport, right? Believe it or not, you cannot hear airplanes in that hospital. Another aspect of it is that we have constructed a helicopter stop in this location (indicating). I think probably the Torrance Memorial Hospital is the only hospital in the area that has positive control clearance approaches and departures for the Coast Guard, the sheriff, and other medivac-type operations.

Avigation easements are obtained just as street, sidewalks, sewer, and other easements are obtained for newly-developing property or property requesting modification of existing uses. In congested urban area land use planning, reuse, deed restrictions, and aviation easements are limited as remedial measures. All you have to do is look at this area on the photo and you will see how limited they are. There still exists residential uses which are impacted by general aviation aircraft operations.

In 1970, aircraft noise, together with changing land use, raised questions in the minds of the city council and members of the community. A process was started to review the goals for the airport which resulted in development of the new airport master plan and the noise abatement program being used today. We spent seven years in dealing with this master planning effort, three of them involved review of eight draft EIR's. The eighth one was finally accepted. We are now being sued by a neighboring community who feels that the eighth one was not adequate. A series of public hearings was held on both the noise abatement program and on the master plan. This was a trade-off here. Prior to the point in time in 1970 when we began examining the airport, the city council was definitely anti-airport. When we put together the master plan, the trade-off was we would also put together an airport noise abatement program. I am happy to say today that the airport is supported basically by the city council because of the political process, the community involvement process we went through. We began the hearings on the airport master plan in July, 1976. Every Tuesday night for the next several

months, through December, 1976, I went to a city council meeting to deal with an element of the airport master plan in the public hearing.

Before making additional adjustments, it is essential to perform an objective analysis and evaluation of the environment of the airport. This includes not only the communities surrounding the airport, but the airport itself -- its use, types and class of aircraft, and the spectrum of experience of the aircraft operators. You must identify the problem and the problem areas. The average general aviation pilot does not perceive his operation into and out of the airport as a problem. The pilot, generally has no perception of the noise impact of his aircraft operations on the environment on the ground. It is akin to turning a driver loose on a parkway or a freeway without a speedometer and cautioning him not to exceed the speed limit.

Noise is a primary problem. As some have mentioned before, safety may be brought forth as a problem, but generally it is secondary and it is used to support resistance to noise impact. The magnitude of the noise must be analyzed; the source, in terms of the aircraft, its capabilities, limitations of its performance, and its noise. He also must be familiar with the airport area.

Another element of the noise problem is frequency of occurrence. The volume of the noise may be low but many aircraft may be operating in the training mode and the frequency of occurrence of the operations may be every 45 seconds. The noise may not be loud, but it is steady or recurrent. The third element is time of occurrence. We must analyze the time of occurrence and the noise events in terms of the community cycle. What are the people doing at that time of year, the time of week, or that time of day that the noise from aircraft operations would annoy them or create problems for them?

Torrance, with the aid of a portable noise monitor and later a sophisticated computerized system with 11 monitor sites, conducted a series of noise analyses of operations primarily from Runway 29 Right. Eighty percent of the operations occurred to the west. A significant amount occurred on Runway 29 Right. From this analysis we developed a curve which identified the bulk of the aircraft operating at Torrance Municipal Airport. We determined that above 82 maximum and 88 single event noise exposure level, five percent of the aircraft fleet would be affected.

The city council, in initiating action to control the noise in the vicinity of the airport, selected these as the upper limit for daytime operations, together with 76 maximum and 82 single event as the nighttime limits. These limits were selected based on an analysis of aircraft mix and their impact on the community. Our selection and decision appear to have been justified, in view of the court decision in Santa Monica.

Once the information, identification of the problem and possible solutions are assembled, the third effort at remedial measures must be initiated. There must be an education program for both pilot, users, and the community. When you talk about education, most pilots say, "No way," and most community representatives say, "You've got to be kidding." Pilots resent the implication that they are less than competent at their technical skill and a community does not believe that the people thundering overhead and making

noise can ever be educated. Nonetheless, we have attempted it and we have been reasonably successful. Some of our means are a monthly newsletter, provisions for operational evaluation of aircraft to determine noise level, and most important of all, communications. The monthly newsletter is sent to both pilots and persons in the community who wish to receive it. We have a subscription list of over 4,500 at this point. And in this newsletter we report on the current status of the noise abatement program, new techniques -- caution on time of occurrence and frequency of occurrence.

With evaluations, the city has utilized the newly acquired and installed noise monitoring system to review pilot, aircraft performance, and flight techniques. As you can see, we have a multi-type unit here. On 22.9, with this thing here, we can talk directly to the pilots through our own frequency acquired from the FAA for noise abatement purposes. A pilot can make two or three runs using different techniques and get instant answers on which technique is most effective in reducing noise from his aircraft operation. The great majority of the pilots are cooperative and understanding in response to the education program. Pilots pride themselves in the professional execution of their skill.

The education program is also an excellent tool for communications with the community on what is being done, what is not being done and why.

This is a recording device. We have a noise complaint hot-line. The number is published in the newsletter regularly, and it is available both in the police department and the city hall switchboard. We do not man the noise abatement line 24 hours a day, but with this we can get effective response back to a resident when someone in the community complains about aircraft noise. We also have an advisory line, pilots' information. If someone wants to find out what the restrictions are or what the problems are at Torrance, they are merely asked to dial that number and we have a prerecorded message on the noise abatement program and precautionary measures. Education is voluntary and only goes so far.

The fourth element in remedial measures is enforcement. The City Council of Torrance, based on data gathered, analysis, and evaluation of the airport noise environment, adopted an ordinance and submitted it to the Federal Aviation Administration for review. The city received approval of certain provisions in that ordinance, the limitation on time periods when touch-and-go training operations could be performed, and the institution of a departure curfew. Enforcement of these provisions commenced in October, 1978. A series of citations were issued, or complaints filed, and incidents of violations of these portions of the ordinance are now zero. I guess the message there is voluntary compliance and notices of violation do not work. You have to deal with the 10 percent who do not really believe you mean it.

Initially, the local Federal Aviation Administration office made minimal cooperative effort in the city's enforcement of touch-and-go limitations and departure curfews. After some discussion, the Federal Aviation Administration now issues advisories for the purpose of assisting pilots who may be unaware of the limitations -- advisory for noise abatement, request you make a full stop, in response to a request for touch-and-go during prohibited hours. One afternoon, the controller was a little more explicit

when the guy asked him for a second time for a touch-and-go. He said, "Okay, it will cost you \$130." Needless to say, the guy decided to make a full stop. Now, all of this has been most helpful in preventing pilots from being cited and brought into court and fined. Our objective, after all, is to reduce the noise impact, not to collect fines or cite for misdemeanor violations.

The City of Torrance plans to expand its enforcement activities into the maximum noise level portion of the ordinance, based on Judge Hill's decision in the Santa Monica case. This will impact those pilots who have selected aircraft that cannot meet the standards of Torrance, or those pilots who do not or will not utilize the tested and proven techniques for reducing noise from their aircraft operations. Again, the purpose is not to fine, not to cite, but to reduce noise.

Pilots and aircraft owners who meet the limitations at Torrance are benefitted by this enforcement. It reduces the amount of overall noise impact and reduces the pressure for additional limitations on the airport and its operations, thus making this mode of transportation available to the majority of users.

The fifth, most important remedial measure is to report the results. In the four previous steps, reporting the steps and their results is the most important outgrowth and support that can be used. A full disclosure of information, good or bad, on the results of the overall noise abatement program is important in obtaining credibility and support of those pilots and community. The newsletter, presentations to groups and service clubs and organizations of the noise abatement program's functions and objectives interface with media to keep them advised as to the progress. All are important to a successful program. The Federal Aviation Administration's aviation noise abatement policy, published in November of 1976, furnishes a basic guideline for noise reduction programs. A reasonable program, based on proper analysis, evaluation and preparation can be assured of a reasonable response from the FAA.

Unfortunately, there are some elements in any given program that from time to time receive a negative response from the Federal Aviation Administration based on national policy. The Federal Aviation Administration's strict adherence to national policy in certain matters is unresponsive and negative and its impact on local communities, agencies and airport proprietors who need all the help they can get to maintain the terminal element of our air transportation system. The success of remedial measures by the City of Torrance and other general aviation airport proprietors would be much more productive if the Federal Aviation Administration were more responsive at the local level, permitting the regional offices more flexibility with general aviation airports, their needs and their requirements. This will lead to a policy which can reflect positive noise abatement efforts in general aviation designed specifically for general aviation airport proprietors.

In summary, the case study of remedial measures at Torrance Municipal Airport includes land use controls by redevelopment and reuse, deed restrictions, aviation easements, and acoustic construction requirements to

protect the airport and the community. It includes commitment of resources to a program. Without this commitment of dollars and people, any program is only paper, ordinances, laws, codes, and it will be a paper tiger.

The problem involves analysis of and defining problems, more resources, dollars, people, and equipment. The program involves education for those who can do something about the problem, pilots, the community, more dollars and resources. The program involves enforcement. Some require greater incentive than others to take positive steps to do something about the problem -- more dollars and people. And finally, reporting the results of the program to the community and pilots. Use of the newsletter, periodic reports to the citizens advisory committee, airport commissions, and city council keep the pilots and the community informed of progress.

With these remedial measures, Torrance has reduced the airport noise contours, accommodated a slight increase in operations, gained a significant increase in revenues, and we have no more demonstrations and protests in front of the city council. It has worked for Torrance. We think it is a model program.

I would be remiss if I did not give credit where credit is due. Chuck May, my airport program specialist; G.A. noise abatement specialist, John Carisan, and Ron Waddell, Department of Safety, compose a noise abatement team. These people are ready and willing at any time and under any conditions to deal with community questions, the pilots' evaluations, aircraft manufacturers, anyone that wants to talk to us. We have gathered a significant amount of data on general aviation aircraft in the last three years and these three gentlemen are primarily the people who have done it. I would also like to give credit to the Division of Aeronautics of the State of California. They chipped in \$152,000 to make up the \$165,000 for that nice piece of scrap iron I showed you there. That has been a significant help in our program because it has identified the problem and it has identified some of the solutions to the problem.

One of the things we are tagging onto that computerized system in cooperation with EPA Region 9 is an automatic aircraft identification mode. We are going to do this for evaluation and we probably will have it installed next week. If any of you are in the area, you are welcome to come down and see our facility, our system, and to see this application of Auto ID for aircraft.

And last of all, I have a few examples on that far table back there of the information items that we have turned out. It is a very small amount. We have probably turned out over a truckload of paper in the last three years in this program. It consists of a Jeppeson insert; a fact sheet on the noise monitoring system; a brief fact sheet on noise, single event, and giving some types of aircraft and their noise, maximum and minimum; a couple of copies of our newsletter.

Thank you for your time and patience.

MR. STANLEY GREEN: Bill, basically, what kind of a program do you have with respect to itinerant traffic, informing them? We understood you had

some proposed requirements on training at your airport with respect to the itinerants. Is that not true?

MR. CRITCHFIELD: No. With respect to itinerant traffic on what is happening at Torrance, we have mailed 30,000, almost 40,000 Jeppeson inserts out, based on the list from the medical certificates from all the cities supplied by the FAA. We also have a program that every itinerant that comes in, one of these little bags that you get on your door knob with advertising in them, we put information in them and we hang it on the aircraft. I think what you are speaking of, specifically, is the restrictions of itinerant training. We have submitted to the FAA a program for several changes in the traffic pattern and operation of the airport. And among those is a recommendation or a proposal to exclude itinerant training traffic at Torrance Airport. We think that this is part of our problem. Our traffic pattern seems to extend so far beyond what is an acceptable pattern for a training airport, we believe it is people who are unfamiliar with the airport and we think that what a lot of the airports are doing in the Los Angeles area and Santa Monica and Hawthorne is exporting air training problems to Torrance. Incidentally, our six flight schools support this concept.

MR. GREEN: I understand it from the local point of view but, as you pointed out, if everybody exports their training, no local training permitted or put restrictions on it, where is one to get training? I know you have explained you have a good program with respect to informing itinerants. Is it not possible to do the same thing with those people who need some cross country work?

MR. CRITCHFIELD: We do not have any problem with the cross country if they make a full stop. It is the circle and bounce that causes problems. All I can suggest is Chino, Fox Field, and you pick up your cross country while you go do your training basically. Mojave, that is a long way to go.

MR. GREEN: It is a long thrust.

MR. ROBERT DOYLE: Bill, my question relates to the land use side of your remedial program. You may well know there are about 15 states, led by California, that have I think tax increment financing procedures as part of their redevelopment program. Burbank has used this very extensively to change a mixed-use neighborhood which is incompatible with aircraft operations. Did you consider that?

MR. CRITCHFIELD: We considered tax increment financing. As a matter of fact, a part of the initial Meadow Park Redevelopment Project, most of the funding was based on tax increment financing. The new Sky Park Redevelopment Project, just north of that -- it would not fly because of Proposition 13. There wasn't enough margin left in the tax revenues so what they actually did was that when the land management team in the city -- consisting of executive staff, department heads -- they devised a plan to go out to private developers to bring light industrial commercial use into that area and they would put up the front money. The city would acquire the property and put the deed restrictions on it and the height limit on it and they would transfer it to the developer. We had five proposals and we selected one and went with it.

MR. DOYLE: Thank you.

MR. ELKINS: Chuck Elkins, EPA. Bill, what is your reaction to the Federal policy that airports should control source noise only in terms of the levels of the aircraft measured according to the FAR procedures, and that airports should not have monitors off the runway to check performance or operation. It sounds to me as if you have problems there in terms of how the aircraft is operated and where, in addition to just what kind of aircraft the people are operating.

MR. CRITCHFIELD: I do not agree with it. I think it penalizes general aviation. It works fine for air carriers, but I definitely feel it penalizes general aviation. Because if you become involved in a type-ban of aircraft simply because one aircraft or a small group of that type of aircraft is creating problems -- let's give it an example. I think you all know a Beech Bonanza can be a very noisy aircraft. You have 20 Beech Bonanzas and three owners fly theirs like the Battle of Britain, for lack of a better term. So, you have a problem. You have a community pressure for a type-ban. So, you type-ban. All 17 guys take it in the necks for three guys' responsibility. Our experience has been that in the general aviation sense, if your monitored sites are properly located, there is no way the guy can fly the airplane to beat the box. And to supplement that we have, as you saw, the 614 portable monitor. If we begin to generate complaints of guys throttling back to beat the box and pouring the coal to it later, we will go out to that site and we will set up that monitor and that will go on battery for four days. If we begin to develop a problem area, we will go back to the pilot. I really don't agree with it. I think it is penalizing the users and the industry; coupled with the fact that we work with general aviation pilots. We have talked to them and the majority of them are like the community; they understand. They find out that they can fly the aircraft quietly and they go about their business and they do not say anything about it. But, five percent or ten percent or whoever they are who just are not going to cooperate, I do not want to use the word but who just are not that proficient, are the ones who protest. We have found that our system seems to be working. We wish somebody would come out and take a good long look at our system and talk to some of our pilots on the field and find out how it is working and how well it is working.

MR. GOODFRIEND: Lewis Goodfriend. I have a question on the economics of this activity. I would like to know the population of Torrance and what the noise abatement budget and annual budget are. I think this is an excellent program but in terms of applicability to other municipalities, I don't think it would work.

MR. CRITCHFIELD: The population of Torrance is 134,000. The annual budget for the noise abatement program is a \$100,000. The capital investment we have in the program so far is a half million. I think what you have to understand is that Torrance Municipal Airport serves an area of two million population. If you will recall some of the slides that I was showing you, especially the map, the aerial photos, the airport was developed in such a manner a long time ago so that it would never be a burden on the general fund, the city. It would be self-sufficient. The commercial frontage along the Pacific Coast Highway, the industrial developments on the north side, the

shopping center to the right of your screen, all of these things generate least revenues. I commented to Bob yesterday, when he mentioned the difficulty in supporting a general aviation airport, believe it or not I am being accused of not being self-sufficient because now people are saying, well, you know, the aeronautical area does not support itself.

I don't know, you cannot win, so this is where our revenue base comes from, primarily that. Also, we are not cheap on our fees. Of course, we have not equaled what the marinas charge for ship rental.

ATTENDEE: What are your fees?

MR. CRITCHFIELD: Basic class one -- which is your average general aircraft -- is \$45; fuel, speed gasoline, three cents a gallon; oil, twelve cents a gallon. And of course, we have our rental rates on most of our land, based on eight percent capitalized value of the land value. We also have all our leases since 1958. The rental is tied to the wholesale price index of all commodities, now called the producers index. The poor guy who rented a tie-down spot for \$15 in 1969 is now paying about \$32 a month. I am sorry, for a hangar site, just the bare ground, \$15 a month in '69 and is now paying about \$32 a month for that same hangar site based on the price index increase.

Incidentally, our costs have gone up horrendously. I pay five times as much for weed killer today and it does a third of the work.

ATTENDEE: I think your tie-down fees are too darned low. I give you an example: At Van Nuys, it is \$8 for the same thing. I think this is an area that pilots will protest from now to doomsday, considering the shortage of tie-down space in the major metropolitan area. It is unfair to the airport to tie itself to an unreasonable amount of revenue.

MR. CRITCHFIELD: I understand and I agree with you. From strictly a land value base, they should be about \$65 a month right now but the pilots also have access to my board of directors just the way the community does.

DR. BRAGDON: Our next speaker will be talking in a different area and this is in the whole area of preventive measures for dealing with noise at general aviation airports. Before, we were talking about remedial techniques. Now we are into the preventive area. I am pleased to introduce Gordon Jackson, Deputy Regional Manager of R. Dixon Speas & Associates, Atlanta. Dixon Speas & Associates is one of the large airport planning firms working just in airport planning in the United States and has had considerable experience working with many GA airports throughout the country.

MR. GORDON JACKSON: Thank you, Cliff. I have always wanted a pendant but I had hoped it would be gold. I was unable to be here yesterday and just so I can expect the direction of some questions for your own interest, may I have a show of hands as to how many of you here are from public agencies, city, county government planning agencies or something of that nature? How many of you are?

MR. JACKSON: How many from associated industry in general aviation or aviation as a manufacturer, GAMA, ALPA, people like that? How many of you fall into that category?

MR. JACKSON: That is the other 90 percent. Getting down to the question of preventive measures associated with general aviation, it is a little difficult perhaps to really differentiate between pure remedial measures and those which are purely preventive measures. In the industry we quite often use a number of cliches or various expressions, trying to differentiate various things. One expression that we quite often hear, not only in this industry but in terms of a lot of other industries, is that there is no such thing as a free lunch. Well, basically this is true. We hear this quite often when any number of groups may be polarizing on a particular issue and presenting simplistic solutions to questions which many of us feel are anything but simplistic. In the free lunch bit, if we can examine that just a little with respect to the simplistic answer thing, while the lunch I enjoyed was very much free -- since Tom bought it -- it was not free for Tom. So, with respect to that kind of thing, I would like to perhaps throw out one more little cliche, one that Mr. Newton solved; that is, for every action there is an opposite and equal reaction.

I think just this morning you have seen that anything dealing with noise problems associated with any size airport, I don't care what size airport it is, there are very definitely two sides to the question. On the one hand we can reduce the impact of general aviation noise considerably by carrying out XYZ actions. But the other side of that particular coin is that there are costs associated with those actions which must be examined to determine is that particular action warranted.

In the case of Torrance, which we just went through, we have an operating budget -- I think Bill mentioned, if I can generalize in round numbers, it was somewhere in the neighborhood of slightly less than a dollar a head for the operating budget for the community to run the noise monitoring system. But for that particular community they have decided that that is a worthy cost for them. In some of the other airports around the country we find similar situations and I think again the Santa Monica case is one which certainly will be getting more and more light as time goes on.

I recently had occasion to visit an aircraft manufacturing plant and that was the first time I had been back in such a facility since I was involved in an undergraduate career. At that time I was working in a sheet metal and welding fabrication plant as a jig builder and so on, so forth. And I will have to confess I had forgotten how noisy a rivet gun working on metal suspended in a jig can actually be. I want to tell you I walked by the particular area where they were fabricating a nose cone rather quickly. I will also confess I had my fingers in my ears.

I checked with some of the guys in the plant later and found that the plant had met all of OSHA's requirements for whatever OSHA does, all of the noise associated with the plant -- ear protectors and that sort of thing. But nonetheless, the noise was still, to my ears, most significant.

Fortunately for general aviation, the measures are a little bit more productive than either walking around with your fingers in your ears all the time or, on the other hand, preventing the noise from occurring. The only way you can really prevent the noise from occurring is that of stopping the noise. We hope that does not happen too terribly often, but doing noise abatement studies which we quite often do, the ANCLUC studies, there are basically two approaches you can take and usually you take both of those approaches.

One is to quiet the source to the degree possible, i.e., the vehicle, the aircraft itself in its operation. In dealing with air carrier noise problems, we look at the approach patterns, departure patterns, the kind of noise abatement profiles that we are actually flying in an attempt to reduce the impact of the noise on the ground in any particular spot. Beyond being able to reduce the amount of noise received on the ground, then we have to get into Lew Goodfriend's talk this morning in remedial measures of what can be done to make the ground underlying any particular noise level more compatible with that noise. I think here the Santa Monica case is somewhat interesting.

There are two sides to that particular question. One, they have a lot of noise in the community and, as has quite often been said about California, things happen there first. They are very, very concerned with the amount of noise in their community, and I think Bill indicated the same thing for the Torrance area this morning. And coming up with the kinds of noise abatement plans that they are coming up with in these particular areas, I think it is plain that these communities have decided that to quiet the aircraft noise impact is very, very important to them -- even to the extent of perhaps tightening down a little bit on the flexibility of the aircraft machine operating in general aviation service.

I do not think that it would be well at this point to spend a long time trying to convince you of how important general aviation is to the nation's economy. I think ALPA and GAMA will probably attack that fairly well. I would like to leave it if you will allow me, with the explicit assumption that general aviation is most necessary to the nation's business community as well as our overall transportation in this country.

Having stated that then, what are the ways in which we may provide a preventive treatment to the effect of aircraft noise? There are basically three methods. These are the treatment of noise at the source; secondly, the treatment in the planning for airport facilities and, the third one, the protection of those facilities from encroachment. Now if you are thinking that you have heard some of this this morning, you are right. Perhaps we can discuss it in just a little bit of a different light.

Our work has involved several of the airport noise and land use compatibility studies or as we colloquially say, ANCLUC studies. In those studies we have to recognize that much of the work deals with the treatment of the residual noise, that which is left after the source has been quieted to the extent possible and/or reasonable. And again we come back to the trade-off of the two sides of the question, because both have to do with that.

Noise can only be abated at the source. In other words, we have got to quiet the vehicle. If we have a truly quiet airplane then we will not have the kinds of problems we do in trying to treat noise and planes for those problems associated with them. At the recent NBAA Convention here in town last week, many of the new aircraft that were displayed at DeKalb-Peachtree Airport were dressed out in the new props -- coincidentally, they were mentioned in Bill's newsletter back there -- that were bent back toward the cockpit. And checking with the manufacturer with respect to the kinds of noise or solution of the noise problem, whatever they may offer, we were informed that the basic noise relief is in the cockpit. The parcel has not come to the point at this time of being able to relate that to whatever benefit may accrue to those on the ground. We would hope that at some point in time similar benefits for the ground will exist with either this or some similar type of prop treatment.

General aviation pilots can fly most types of takeoff procedures. They can fly them perhaps as well as air carrier pilots. Again, I think we come to a point here this morning, stressed to some degree, and that is education. It is incumbent upon those of us in the industry to educate the general aviation pilots that, first of all, there is no such thing as a free lunch any more -- if there ever was -- but certainly none exists at this point. So that those pilots of us who are operating from places like DeKalb-Peachtree or Torrance or Santa Monica or any other number of other metropolitan airports that we can name today, there are some very significant problems associated with the manner in which they operate their aircraft.

Now, I noticed on Bill's noise abatement profile, which I had not had the occasion to see previously, that they are suggesting flying somewhat steeply and then converting to a cruise climb to a safe altitude.

In some of our work we have investigated various procedures and we have recommended to climb to 1000 feet at best rate of climb, in whatever vehicle it might be. We have recommended best rate of climb over best angle of climb since general aviation quite often has a number of first-time riders in that aircraft. For those of you who are not familiar with those terms, best angle of climb is the best angle of climb which would give you the maximum altitude over the shortest linear distance along the ground. The best rate of climb gives you the highest altitude over a time limit.

So, in climbing at best angle of climb, that climb is a little bit steeper than it is at best rate of climb. The best angle of climb has been known to, we would not say frighten, necessarily, but cause some apprehension in the back seat of airplanes when it was the first time for riders. They were not exactly sure of what was going on.

General aviation has this problem. General aviation has the problem of not necessarily negative press but they sure like to report the night a G.A. airplane goes down. So, with respect to this -- you know, this is one of the other sides of the question. We have got to recognize that that is a real problem.

However, we can climb out very safely at best rate of climb to some predetermined altitude. The particular case where we recommended 1000 feet,

most G.A. airplanes can get up and get to 1000 feet and remain, not necessarily on airport property but close enough to the area so that there is not the impact it would be if they dragged the thing out right on across the countryside. We are recommending that they get up and then convert and throttle on back to a cruise climb or regular climb power for climbing on out of the particular area.

The general aviation pilots can fly these kinds of profiles if they are educated as to, one, the absolute necessity for their doing so because again, as I think perhaps both speakers this morning indicated, there are a number of G.A. pilots who kind of feel that does not mean me, because all I am flying over here is a 172 or 182 or a Cherokee, or whatever. I have got to confess that one of the noisiest airplanes I have ever heard is a Cessna Mixmaster, front and rear props. If you have never been under one of these things when he was -- well, the prop noise from the particular machine is significant. It is significant though and it has to be recognized.

There were a couple of other points made this morning which I think were terribly appropriate and that is in Andy Harris's paper in the INS magazine, that the perception of the community as to what is actually occurring when you see these guys out running around doing the bump-and-goes, touch-and-goes. What does a community actually perceive going on here? That it is a useless activity, and the response to that useless activity is that they are much more annoyed at much lower levels of Ldn or any other method of description you care to use. They are still highly annoyed at a much lower level of sound than we otherwise would have thought.

My own arm chair reasoning for this is that the community unit often perceives that this is a useless activity; that some rich guy out here in his airplane is just flying around the skies and boring holes -- is the term -- spending his money; he's got it, he can spend it that way, that kind of thing.

There is very little realization in the community that first of all, for general aircraft to come out of the doldrums with respect to our safety record which has got to occur, we have got to have training and proficiency flying. Now if you can, differentiate between those two things for just a moment. We can call training, primary and secondary training in terms of commercial and instrument ratings. Proficiency flying is that kind of activity which has to go on to maintain your currency and, quite frankly, I am a firm believer that strictly meeting the FAA guidelines for currency just does not really get it. To really be proficient, you have to fly just a little bit more than that to be good and proficient, if I can use the term proficient instead of current.

Those two categories of flying are very, very important to the industry, but they have got to occur and I think that we have not made the point strongly enough with the community that these are really necessary forms of flying. On the other hand, we have not made the point to the pilots that while this is really a necessary activity, it can be done in a manner which is more compatible with environs of the airport. And I think those are points which must be made.

In looking into the airport planning scenario, I do not know what we can do in terms of airport planning to prevent the impact of airport noise. Quite frankly, in most of the airports which have been discussed here today, there is doggone little we can do to prevent the impact of noise through airport planning. We can do a number of things, such as noise barriers, certain categories of operations, and in terms of maintenance run up type of activity. We have to go out and run up an engine somewhere and we can perhaps prevent the impact. Again, we cannot prevent the noise but we can prevent the impact from reaching a particular segment of the community through locating a run up area which is specifically the only run up area that can be used on the airport.

Again, this comes back to the airport operator's obligation in making sure in his airport rules and regulations that that is the only one that is being used.

Noise barriers, sound barriers, sometimes may provide some benefit. We worked with Dr. Clifford Bragdon on some issues up in Norfolk awhile back in looking at what kinds of treatment can we use in terms of noise barriers, sound barriers, and we did find that in these specific instances some cases around Norfolk where we might be able to get some benefit through barrier erection, not to prevent the noise but to prevent the impact from reaching certain significant areas of the community which would not be satisfactory for redevelopment.

These kinds of things we can look at but, quite frankly, they more nearly qualify -- as Lewis Goodfriend was saying this morning -- in terms of remedial treatment rather than preventive treatment. About the only real preventive treatment I think we can look at is site selection for new airports to prevent the impacts of G.A. or any other category of noise.

Some time ago there were a couple of different categories of noise of airports, the two largest ones in the country that I would intend to discuss with you in a second; Dulles in Washington, D.C. and Dallas-Fort Worth. The sites of these airports were selected and they were generally way out in the country. As a matter of fact, on the Dulles Airport we kept hearing in the press a lot of discussion about the airport was so far away from town that nobody was ever going to use the thing. Largely, that has been true. Up until recent years it has been the intercontinental or west coast kind of airport, only long haul with everything else being carried out of National Airport.

Congressmen like to fly out of National Airport. The Dallas-Fort Worth Airport was originally constructed on I think a land mass of some 17,000 to 18,000 acres and at that time was considered to have a very large land mass and would be able to delete noise problems for some time to come. Well, that ain't necessarily so. Both of these airports are presently having noise problems because, like the photographs which were shown this morning, the community has all of a sudden found the airport and is encroaching upon it. We would hope that in selecting sites for new general aviation airports we could prevent that kind of thing from happening.

But when we do select a site for a new general aviation airport it should be one which has a very minimal amount of residential development around the thing, and we would hope that we could follow it with some preventive land use and zoning protection for the airport.

Now, this is the third type of treatment that I think you might want to look at. Land use and zoning basically are good until the next meeting of the commission or the city council or the county commission, whichever it might be. We have all had experience with this and we know how well we come along and develop all these but the little plans we never get opened. We have got to stop that kind of thing. We have got to be realistic in our approach to land use planning and zoning and impress upon our city officials, county commissions, whomever they may be, that -- Look, guys. Right now the airport does not have a problem and we have got an airport sitting out here and there is nothing around it for six miles in either direction. That is right now. Two years from now, five years from now, whatever it may be, that airport may very well be encroached to the point that the usefulness of the airport is reduced considerably.

We talk about remedial noise abatement measures, any kind of preventive measure to reduce noise impact on the community and that is what we are really worried about. If the aircraft noise were not affecting the community and the community's development, then we really could care less how much noise the airplane makes. That is not the case. We have very significant problems in the fact that the aircraft sound -- air carrier, general aviation -- strictly across the board affects the ground which underlies the approach and departure paths of the airport.

Once the thing hits 30,000 feet it is a flame thrower and, again, we are not necessarily worried about it or if it gets to whatever altitude given to the type of general aviation, again that is not significant. But we are very, very concerned about that part which lies within the immediate vicinity of the airport. That is where your complaints come from and, generally, that is where all the hassle comes from.

So I think we have an education program on our hands. We are trying to educate the pilots, telling them -- Look, guys, you really cannot fly the aircraft this way. But on the other hand, we also have got to convince and impress upon our duly elected officials that if you really go ahead with this particular zoning change that you are talking about and change this commercial district or this industrial district to single family housing, or whatever it might be, that downstream -- and we need to start quantifying what kind of downstream problems we are talking about -- your airport is going to be restricted.

Any of these measures we talk about are basically restrictions to the airport or to the operation of the aircraft at the airport. I think Bill will agree with me that this is exactly what they are talking about in Torrance, California, anywhere else.

Pete is going to talk about it in Westchester County. I was up there several years ago doing a tour around there for some work we were doing in the territory and I had the opportunity to go around the airport and observe some

of the things going on around there. That particular scenario is neighborhoods, clusters of small boroughs which get impacted and the aircraft noise gets high. Westchester Airport is an airport, as I can recall, which is very heavily used by the home offices of major corporations in the country. A lot of business activity at that airport is essential to the business activity being located in that vicinity.

Now, I believe also that there have been some major corporations move from that area. They are settling around out here now, but they have got the same problem. The airport is vital to the continued success of the community but, by the same token, the airport has got to live in the community so we have two sides of this question.

I do not want to beat a dead horse but I think it is essential that we all realize that there are pros and cons to each of these issues. If I cannot arrive in the middle of the night when I have been out on the road somewhere and get back in, then that is a cost to me. It is a cost of a motel somewhere else, perhaps; it is a cost of the wasted time which we all have enough of anyway, I suppose. But these are costs which have to be articulated and recognized as being problems.

We have found in our studies that air carrier airports are not alone with their problems, with the fact that the county commission does not really realize what is going on. We see any number of comprehensive plans -- and here I am hollering at some of the planning consultants as well as people who work in the planning departments. We see any number of comprehensive plans which have not recognized to any degree the fact that there is an airport noise problem associated with any airport. Now, we also have to recognize that there are trade-off problems involved. We recognize that and get it out of the way, but we daily see these particular problems.

Some reasonably major communities have not even recognized that there is an airport there in terms of what sorts of development they are planning around the particular airport.

I think we have got to start recognizing this kind of thing. Certainly, there is an opportunity to cast a shadow on the value of the land involved of a particular developer. Developers are very influential people and, quite frankly, without them we would have a hard time doing anything in our communities, certainly. But by the same token, the particular developer holds a piece of land somewhere very, very near the airport and he perceives the best use for his particular land is going to be multiple residence dwellings. Perhaps that should be reviewed by local officials.

Is your airport manager or the airport commission keyed into the decisions made in the planning field in terms of any kind of land use planning made around the airport? Quite often they are not. They are the last guy to hear. Perhaps they should be the first to hear. We find that in order for some of these things to be recognized, we have got to expand our communications. We keep hearing communication, everybody has to communicate with everybody else but by the time we get through doing the thing the plan is six years old. Hopefully, sometime along the line, we will be able to hasten this process and get key people into the front end.

I know the guys at Fulton County keep the Fulton County manager keyed into anything going on around that airport. Whatever may be coming up, he is one of the first guys they contact to say what do you think about it too. That is absolutely the way I think it should be.

In recognizing again that there is a down side to some of these questions, in the case surrounding Dulles we have been informed that in Fairfax County, the Fairfax County pilots have submitted to the Virginia State Legislature a legislative package to enable the county -- Let's see if I can get this correct -- to enable the county to zone areas in the immediate vicinity of the airport for residential development, based on the premise that the residences developed in this area will have sound insulating characteristics associated with the development of those structures.

Why are they doing this? Why is Dallas-Fort Worth area developing around the airport to the extent they are? My answer is basically that along with many other areas, metropolitan areas in the country, Atlanta is certainly not the least of these, there are developing pressures for new housing which are extremely strong, such that we cannot sterilize the land to the degree we would like to.

So, the value of the land is extremely high and in order to develop this land I think the approach they are taking in Fairfax County, that of having legislative approval for differentiated building codes to allow them to stress sound insulating characteristics in various residential buildings, is an approach which is going to get a lot more coverage in the future and any other number of areas.

We were informed some time ago back that the State Attorney General had looked at this just a little caustically because they cannot allow differentiating building codes in the State of Virginia, Commonwealth if you will. I understand you have that in Torrance and it is something that is going to be looked at a lot more. I think we have got to look at it because all of a sudden you come around to Dulles Airport or any other you care to pick on and it will be stymied in its ability to serve the transportation needs of the country.

Just to try to summarize and wrap up some of these things, I think the American economy is built very largely on the free flow of goods and services across very wide areas of the country, internationally if you will. Transportation is and has been the life blood of the economy and air transportation is not the least of these transportation means. General aviation is playing a larger and more important part in this particular picture as every year goes along. Right now general aviation is coming very much to the forefront because those of us who travel quite often are having a heck of a hassle trying to get onto air carriers. A couple of years ago we could walk over to the airport 10 minutes before the flight and get on any particular flight because there were always seats available. I am wasting an awful lot of time now by getting to the airport 40 minutes early just so I do not get bumped.

So, general aviation is now becoming a lot of companies. Businesses are realizing that in order to move their personnel in a timely manner, have them there at the time they need to be there, that general aviation is becoming about the only way they can really do that.

Just an example, mechanicals will happen in any aviation industry. But I was an hour and a half late getting to Fort Lauderdale the other day because I sat on the ramp over there while they supposedly had to bleed the hydraulic system. I didn't hear any bleeding going on but there sure was a lot of airplanes stacked up and I think there was a gate holding process. Well, needless to say, I was just a tad late getting to the meeting. Therefore, in resorting to Mr. Newton's law, those communities which construct curfews and operational restrictions will find themselves in some difficulty in providing no access to a transportation system to those pilots and aircraft operators who violate common sense rules and do not operate the aircraft according to the regulations and policies, and will also find themselves welcome in fewer and fewer communities. Obviously, no one is really interested in preventing the operation of aircraft because, again, I think it is becoming extremely necessary. But those who are not interested, the top 10 percent or top whatever percent it might be, will find themselves in some difficulty.

The prevention of noise in the community will require the full cooperation of the manufacturers, the pilots, and the operators and the planners of airport facilities to bring all of this thing together in terms of continuing full access to the nation's transportation system.

Thank you for allowing me to be with you this morning.

DR. BRAGDON: The next speaker is Peter Eschweiler. Peter is a Commissioner of Planning for Westchester County Airport in New York and will be presenting the discussion on his airport in terms of a case study. Peter.

MR. PETER Q. ESCHWEILER: Thank you very much, Cliff. Good morning, ladies and gentlemen. You know, the last speaker on the morning program always anticipates that his time is going to be compressed and many of the things that he wanted to say have already been said by the others, but to have had the preceding speaker give the first five minutes of your opening talk, that is --.

I am Commissioner of Planning in Westchester County, and we do operate the county airport facility there. It is the only airport within Westchester County. It is the fourth busiest airport in New York State or possibly third, depending on the year. I think it was Chuck Elkins yesterday who, when we closed, gave as a final note the reaction to the comment: After planning, what next? We were not going to get anywhere with this unless we were willing to put our money where our mouth is.

Well, my notes said: Bribery. This is really the message I want to bring you this morning, except please call it intelligently applied capital improvement programming. It seems that nothing we do in Westchester County ever fits the norm. If there is a simply way of doing it, we have invented a more complex way and, as a result, we have had our share of problems at the

airport. We have had our share of problems with operations. We have had our share of problems with noise. We have had our share of problems with lawsuits. Some of these problems are due to the nature of traffic that we handle at our airport, some to do with its location, some to do with the fact that we are in a neighborhood with very well-to-do, very sophisticated people who have sophisticated ways of reacting to the irritation of their patterns of living and means of defending what they believe to be their inherent property rights.

Some of our problems are due to the nature of powers of government in New York State. Where we have succeeded, it has been a product of a program of investigation, cooperation, and participation. Where we have had our failures, as Joan told you yesterday, it has generally been the failure of communication or rather, in some cases, a failure to communicate at all. We have found that where we have given our airport neighbors an opportunity to participate with us and treated them honestly and fairly, we have been responded to in kind. I would like to tell you some more this morning about our particular program and our approach.

(Slide) Westchester County is located in the southeast corner of New York City, just north of Manhattan and extending perhaps 30 miles beyond, down here just north. We are one of New York State's smaller counties with an area of about 450 square miles, but we have one of the largest populations. The chart shows that the county has a population larger than 11 of the 50 United States and, indeed, larger than a couple of them combined.

Westchester County's shape is that of an hour glass, with most of the land area in the northern part but most of the people-sand in the hour glass in the southern part. We have a population of 900,000, slightly less, and it is a declining population. Housing pressure is there but they are not in the open competitive market for the land.

For many years we have been thought of as a bedroom community for New York City, but today over 360,000 people both live and work in Westchester County. Those whom we export to work generally go to New York City by commuter rail.

In terms of our topography, Westchester can be likened to a piece of corduroy, a lot of generally parallel north-south trending valleys. It makes traveling north and south into New York City relatively easy but plays havoc with any attempt to move east and west in the county. And that means that the cross-Westchester corridor, which is an interstate system going there (indicating) just south of the county airport is a critical one in terms of movements throughout Westchester County.

Our industrial base in most parts is in office and service, government, retail and the like. We have a large manufacturing population. We are home to a number of major industrial corporations of America but very little of their manufacturing work takes place in Westchester County. Our list of national headquarters is impressive; that is, AMF, Nestle's, Texaco, IBM, Pepsico, and General Foods.

In addition, in nearby Connecticut, are headquarters, such as those of AVCO Corporation, Xerox and American Can. Many of these firms own one or more corporate aircraft and base them in our county facility.

Westchester County is a source of water supply for New York City and although the city's aqueducts now extend far beyond Westchester County, all of them pass through Westchester County and many of the lakes of the county are actually manmade, holding bases for the city's water supply. The lakes themselves are an important asset in the open space of the county, and the City of New York is one of the largest property owners and taxpayers in Westchester County. The reservoir system is an important element of our approach protection to the county airport and not only does it help there but also adds to the charm of the county and adds about 16,000 acres of park-like open space to the county's own park system, which involves another 14,000 acres. This means that over ten percent of the county is preserved in a permanent, open category by just two governments.

Add to that the lands held in the schools, colleges, municipal park systems and you have a relatively open countryside, one which our residents are very eager to defend.

Joan mentioned to you yesterday the history of the county airport; that in 1941 the county had decided to build an airport at the present site and had indeed made a proposal to purchase the land. But before we did so, Pearl Harbor intervened and the Federal Government withdrew its promise of support for the construction of the municipal airport. A few days later they arrived back on our doorstep with a proposal that if we bought the land they would build a military base and at the end of the war would turn it back to the county as an operation for their county airport and, in turn, we would inherit all the buildings, runways, and appurtenances to us at no cost other than our investment in the land.

By 1944, due to a change in the war, such that the military realized they would never need to use this as a base for the New York metropolitan area and so it was turned over to us even before it had been completed. It was never used for military operations.

As a result, it did not have the hangars, control tower, administration building, terminal, none of the other things that we had been led to believe would be there when we took it over. So, the county, after much soul searching decided not to go into the operation of the airport as a county facility but rather to lease it out to private enterprise to run on a concession basis for us. They went through a period of bidding as to who would take over the airport. The successful bidder was a subsidiary of Gulf Oil Corporation and an 18-year lease was negotiated with them in which they would operate the airport and in return would build many of the buildings -- the control tower, the hangars, the terminals, so on -- for us at no cost and at the end of the lease the buildings would come back to Westchester County.

That lease was extended in the mid 1950's to run to 1977. But towards the end of the lease it became clear that this particular method of operation was not meeting the needs of the county. We needed an operation that would be more responsive to the users, to our tenants, to the county

itself, and particularly to the community. As a result, we have done away with the concession form of government and have turned instead to a professional manager.

Our manager is the Metropolitan Air Facility Division of Pan American Airways. Now, that manager works for the county. He is treated as a subdivision of the Department of Public Works and works for a fixed fee on an incentive bonus and his connection to the county is through the Commissioner of Public Works, who can work with him in setting of operational policies.

High on the priority list of these policies is an improved community relations program, and one of the first things that was established was the noise complaint phone that is manned 24 hours a day at the county airport.

As a result of the sub-concession agreement with Gulf, a number of private corporations did become subtenants on the airport and built hangars of their own, either to serve their own fleet or in some cases to provide facilities for aircraft of other corporations. There are 23 fixed base operators at the present time. Two of them serve the heavier corporate aircraft and others serve the light plane market, including flight school and light aircraft repairs.

The fourth FBO will be added in the near future in order to give greater competition in service to the light aircraft general aviation fleet.

Our airport is purely and simply a general aviation airport with great emphasis on the heavier corporate fleets owned by Westchester County and nearby Connecticut corporations. Certificated airlines service has been provided to a limited extent over the years by first American Airlines, then by Mohawk and more recently by Allegheny. But with the advance of deregulation, Allegheny, our last surviving certificated carrier, has discontinued service as of September 5th of this year.

We are served by several commuter airlines which operate under Part 135 of the Federal Aviation Regulations, and which do a good business although they lack appeal to many of the airline customers that the larger certificated carrier provided.

Over 350 aircraft are based at Westchester County Airport. Over 100 of these are turbo-powered aircraft, either jet or turbo prop. For example, we have 23 based G-2's and almost 80 percent of all the based aircraft are operated for business purposes. There are three runways on the airport; Runway 16/34, the longest; Runway 11/29 is the shortest, 4,500 feet; and the third runway, 53, has been closed for several years -- it is 5,000 feet long -- closed due to deteriorating surface conditions. It is currently used as a taxiway and our master plan will recommend that it remain so.

Runway 16/34 has recently been repaved to a bearing strength of 120,000 pounds. Runway 11/29 will be improved in the coming year to 60,000 pounds. Radar is on the field, we have an instrument landing system for Runway 16 coming in from the northwest and a second ILS has been proposed for the opposite end of that runway, since the back course of that is not a usable ILS.

This proposal, however, is being blocked in the courts by the Town of Rye, the area south of the airport, by a suit against the FAA on the adequacy of the Environmental Impact Statement.

Now, contrary to the point Mr. Tyler was making yesterday, our second ILS was not installed for the purpose of increasing traffic or based aircraft on the field, but to get rid of a rather horrendous circling approach procedure at 600-foot minimum which had a severe noise impact on this area over here (indicating) when the wind conditions are such that you cannot land from the southeast.

Another operational constraint is that the area over Long Island Sound, down here, is owned by La Guardia from 2,000 feet up and so that aircraft departing from the county airport have to stay below 2,000 feet and make a sharp turn away from Long Island Sound and head back to the northwest out of that portion of the county, staying at a relatively low altitude. I think they are 3,500 feet by the time they get to the Hudson River, because they cannot climb in this direction any farther to any part of the southeast and that results in a noise problem for us.

Curiously, though, the approaches to the county airport have been relatively free of major conflicting developments. One of the major objectives of our planning program therefore is to protect these approaches by the encouragement of development only that will be compatible.

Total movements from the airport in 1978 were at about 190,000, down 10 percent from the year before, principally because we closed the runway for repaving. We anticipate an increase to 350,000 by the next five or ten years.

Now, if open approaches to the airport are threatened by development and if approach protection is the name of our game, why does not the county simply change the zoning to limit the land use within the approach zones? That is the New York State wrinkle. We cannot do it. County governments in New York State are unlike counties in most other areas. We are divided into cities and towns, with the latter being defined as unincorporated areas. But unlike other parts of the country, New York State counties have no land use control in the unincorporated areas, since towns in New York State are self-governing, self-taxing, and have control over their local planning and zoning.

We have 43 separate municipalities in the county, all of whom have their local zoning ordinances, their local subdivision regulations, development plans and in some cases have parochial planning objectives. We have 43 separate school districts which may or may not combine to align with the towns and communities which they serve and they, too, are self-taxing and are separate from the government of those municipalities, so that you have 86 separate taxing jurisdictions who are very anxious to get a high level of ratables in their community so they can balance their own budgets, because they rely almost completely on the property tax.

The county has no direct control over any form of land use in the traditional sense, nor over the issuance of any building permits. My department, my county planning board, can only give advisory opinions to municipal governments and then only in certain cases. If we are to develop a county land use plan therefore we need to use indirect controls, using the municipality to act as our agent.

The key element of our strategy here is to use the county dollar for capital improvements. Our capital budget each year is over \$20 million for such purposes as airports, public buildings, roads, bridges and parkways, recreational facilities, transportation, sewer and water district purchases. The budget is financed by a cash contribution from the county of about 20 percent, operating aids from the State and Federal Governments are about 60 percent and the remaining 20 percent is bonded long-term debt.

Where we spend our capital funds therefore can have a great impact on the course of local development. In as rugged a county as Westchester, the ability to control where the water and sewer facilities go, for example, or the transportation lines will go a long way toward determining what the urban pattern of the county is going to be in the future. This concept we have incorporated into our urban forum plan for Westchester County which deals not specifically with the types of land uses across the countryside but rather with the intensity of use and demand for environmental support, since these are the things which we provide in the county capital budget, lanes of highways, treatment plants for millions of gallons of capacity, water lines and so on.

We are in the process right now of doing an airport master plan for our county airport. The county offered the opportunity to the surrounding municipalities to become co-sponsors with this program, as the FAA asked us to, and not unexpectedly they turned us down. They said they did not want to be linked in any way which would imply an endorsement of the operation of the airport, but they were interested in what we are doing.

We had the opportunity to involve them more fully through airport noise control and land use compatibility studies which we are undertaking simultaneously, the ANCLUC.

The principal thrust of the ANCLUC is that it will be possible to make both long-term and short-term operational facility changes on the airport to reduce noise and also exercise greater land use control of the area around the airport. Our objective is a plan of cooperation between us, as the airport owner and operator, and the surrounding municipalities which will minimize the opportunities for land use conflicts.

My department has a major role in coordinating the land use element of the ANCLUC, acting as the liaison -- which means the county government and the Public Works Department and their consultants, Howard, Needles, Tammen & Bergendoff. In the course of the ANCLUC study we will investigate several major areas. We have developed a short-term noise abatement plan which includes those operational and facility changes which can be made within a minimum cost and within the next three years.

Now, the long-term noise abatement plan will combine those facility changes and the land use and management plans for the land around the airport. Here is the preliminary identification of the primary and secondary noise impact areas, the primary area represented by that contour line. This is Ldn 65 above and around the county airport. The secondary impact zone is Ldn 60 and above. Ordinarily, we would have expected that the major areas for control would have been within the primary zone, but because the impact zones have to be modified by areas of noise complaint -- you can see the clusters of areas where there has been a pattern of complaints which would have been revealed by our telephone hot line and by the meetings with other officials.

As a result of these, the plan identifies areas with potential conflicting land use. All of these areas shown in the pattern here are of conflicting land use and the areas of schools, institutions, so on are represented by the cross-hatch area and the red dots.

On the technical side, the ANCLUC will be looking to the remedial measures we were talking about. This one is interesting because it deals with the proposal of a second runway parallel to the instrument runway, to be limited solely to VFR and general aviation light traffic. In our computer analysis of this program, this shows the reduction of noise impact areas that would occur if that VFR runway were established and would permit us to separate the high performance jet traffic from the lower landing speeds of the light aviation traffic, and I think undoubtedly will go in and be added to the airport.

Simultaneously with the start of the airport master plan study, our department was doing another study of the Interstate 287 corridor. That links the Tappansee Bridge on the west side of the county that goes to Tarrytown, the county seat, White Plains, in this area -- Tarrytown over here, White Plains and then on to Interstate 684, which turns north at this point and goes up to the vicinity of the airport. Further on it goes on and connects to the New England Throughway, Interstate 95.

We were studying this area of the county in particular because of the tremendous congestion that can occur along 287 during the afternoon rush hour, and particularly because of these parallel service roads on each side of the road and county highways. We had a capital investment in those roads and our department investigated the degree to which development had occurred in the cross-Westchester corridor and the degree to which potential additional development would happen.

Our study found that within this area, and I just pointed out that the airport is located here, within the entire colored area there are today some 27,000 employees coming to work each day. And that simply on the developed plan in this area, principally that represented by the pink and the blue, within that developed area there was some potential of an increase to 38,000 to 44,000 employees each day by the year 1980, simply in those areas that are currently developed, expansion plans for present industries.

In addition, there are 240 acres within the study area where plans are announced for construction, which are already underway, and which would add another 7,200 additional workers to the highway system. In the vicinity of

the airport our plan identified that there was another 3,200 acres of land around the airport which was, although now zoned for single family residents, was vacant and developable and, if the town plans were to be believed, was programmed to go into some form of development within our study period.

Now I told you at the beginning, nothing is simple. Our county airport is located in three communities in Westchester County, all of them towns, each one given a color up there -- Rye, Harrison, and Northcastle, and the blue area just to the east of the airport is the town of Greenwich in the State of Connecticut. Looking north, the county airport lies up here. This area is the town of Harris, this area is Rye, over here is the town of Greenwich, and up at the north is the town of Northcastle. You can see the proximity of the New York City reservoir lands here off the approach end of Runway 16. This is a state university campus being built.

Headquarters of the Pepsico Corporation, a property I will refer to from now on as the 300 acres, representing this area right off the approach end of Runway 34, another 400 acres in this area, which is under litigation right now as to the appropriateness of the zoning and a county road, Andersonville Road, coming across the southern portion of the picture.

Interstate 684 passes along the west side of the airport, as does the state highway, 120, and 128 comes down the state line over there.

We had reason to be concerned about this 300-acre tract because several years ago there was a proposal to put a major planned unit development on it called the Ryetown Country Club. This was to include one million square feet of retail floor space, 11 million square feet of office floor space, and eleven hundred dwelling units. The dwelling units were programmed to start at somewhere around \$90,000 in condominium form and go on up. The land use for the area which abuts the southern border of the county airport right there, north is in this direction, land use had the retail facilities here, the office facilities in there, and the residential facilities along the south and along Andersonville Road across the bottom. It was a rather impressive looking development.

The county airport here at the north at this time, retail, office, residential, and to its credit a good amount of open space. And this date, based on the composite noise ratio data at that time, the most severely impacted area being here and so that is the area they put into their open space.

We had objections to the proposal both from the county planning standpoint, from the county planning principally because of the retail development there being in competition with our established centers elsewhere in the county, in a county with the climbing population. There was simply no market support for that type of development.

But secondly, from the airport standpoint we deeply resisted any major concentration of population in any form immediately off the approach end of the major runway of the airport. The program ultimately fell of its own weight because it depended to a great extent upon the contribution of the highway improvement to the program to make it work. But it gave us the tip

for the future, that if this area was to be developed in a pattern that we would like to see happen, the control of access to it and the making available public water and public facilities, public sewer facilities, both of which are unavailable on the airport, could be a key factor in determining how that area ultimately developed.

We have precedent for that. In the other part of the county, across the county, the Union Carbide Corporation operates a major technical center in Tarrytown. The county wished to induce Carbide to expand their operation at the research center from 1,700 employees there now and expand it by the addition of additional buildings which would be lucrative to the two towns in which it was located and helpful from our own economic development standpoint.

The county and the towns agreed to join together in a \$2 million road improvement program at no cost to Carbide, the county putting up the lion's share of this, contrary to our general procedures, about one \$1.6 million going to the improvement of the road and the State putting up a portion of the program in the area of an interchange near the Sawmill River Parkway, where they would make additional investment to make better traffic possible to that area.

Looking back to the area around the airport, not only Rye, the 300 acres here in Rye would benefit from this program of improved access, but we could see that Greenwich, which has questions of land use change along its borders, would benefit from more direct access to the interstate, if indeed they wanted to change their zoning. And the Town of Harrison, the 400 acres in litigation right here would also benefit from it.

So, we approached the Town of Rye and entered into a second memorandum of understanding with them, under the terms of our airport planning agreement.

Now, that had to do with the economic development of these 300 acres. The town and the county jointly recognized the importance of improved access to that area and pledged their cooperation to obtaining better access for it to the Interstate 684. The procedure that we used was to go beyond the standard ANCLUC requirements in the planning of the 300 acres south of the airport and to work with the town in the development of alternative land use studies for that area which would look at different development schemes and access for it which might improve its access out to 684 in one form or another.

We went through a variety of approaches, looked at various alternatives that might be possible under different road schemes to see when parcels benefited from it both in Rye and possibly in Greenwich, if that town should choose to follow and take advantage, and came up with a proposal which generally met with the approval of the political leaders involved. That is one which involves an improvement of the airport access road from the interchange at the interstate onto the airport property and then continues up from the interchange and back around onto the airport property, continuing around past the Town of Greenwich as a four-lane divided facility.

It would be brought past the National Guard hangars and into the vicinity of the Westchester County terminal, past the new rental car parking

lot that is under construction, and would be continued to the southern border of our airport to intercept with Lincoln Avenue, an east-west local road at the north end of the 300-acre property.

In return for the construction of this road as a county capital project, we would obtain land use concessions from the town that the property would be developed only in accordance with a prudent schedule, something that we could live with in terms of our airport planning and with a normal amount of height limitations, so on. We have offered a similar agreement to the Town of Harrison, which is an area southwest of the airport, being over in that direction, where they have programmed previously a 400-acre industrial park in the vicinity, just south of the southerly border of the airport.

This area they have shown as an industrial park with a new access out of 684 and a new interchange to be constructed there. This study was based on the possibility that that interchange might not be possible and the other three are variations of that scheme, as shown on the town development plan, with that interchange changing locations to fit the particular development options.

Is there a payoff in this process? Almost immediately there began a psychological payoff. The idea of connecting to this highway system, even though the developers themselves would still have to build their own local roads, has caused no end of real estate interest and the imminent announcement by the developer-owner of one of the properties that a major conference center would be built in this area at a very low density on his property so that it would be consistent not only with the airport noise situation but would freeze the land with a type of development that was compatible to both of the towns and municipalities.

The test for the county is in terms of its pay-back in additional taxes over a period of years. Sometimes this pay-back is tested by a rigorous accounting method, other times the political factor is introduced and the accounting is allowed to slip a little bit or there may be an employment factor or there is the leverage factor, the fact that the county's contribution may make desirable development happen.

We have no final decision yet on the airport access road but the county has kept faith. We have submitted for the next year's capital improvement program a request for design funds for the establishment of the design and construction of the airport access road in cooperation with the town. We have yet to achieve cooperation agreements with the other communities around the airport but we expect that these will be forthcoming.

So, whether it is capital improvements program or bribery or contract zoning or any of a variety of other euphemisms you may put to it, the idea of our program is to find out what the other guy really wants and then see if there is not some way you can get it in a way to help him get it and then, as a consideration for that, you can require that his development be in accordance with your standards and you are going to be far, far ahead. Thank you.

DR. BRAGDON: I would also like to introduce each of the panelists as they come up and I will start here with Ken Delino. Ken Delino on my left here is Manager of Airport Noise Programs for Systems Control, Incorporated, a firm located in Anaheim, California. I believe Bob Clark is next to Ken, and Bob is Director of the Department of Planning and Research for the City of Kinston, North Carolina. Bob has done a very interesting and innovative plan and has been working in the trenches, so to speak, and planning quite a while.

The next individual of course is Bill, who gave his presentation this morning. Next is Bob Miller, Senior Consultant with Bolt, Beranek and Newman, Incorporated in Boston.

Next we have Jesse Borthwick, Executive Director of the National Association of Noise Control Officials, located in Shalimar, Florida.

MR. KENNETH J. DELINO: I said I was going to start out with a question. Let me make a comment first. Most of the speakers have been talking about long, drawn out processes anywhere from 4 to 15 years, if I remember my figures right. I would like to ask some of the speakers and maybe some of the other panelists to share some of their heartaches with us and tell us what they would do over again or how they would do it over again to make it proceed alot quicker. I guess I would like to ask Bill Critchfield that first since he has been at it quite a while.

MR. CRITCHFIELD: Well, I don't think I could make it any faster. There were a lot of things that I would do if I had my druthers. I would get to the community sooner with more information and I think there's always a tendency when you go into a plan to have pride of authorship and you try to defend that. I think probably what I would do is to use more of my staff and I would use a more perceptive approach and when a protest or a disagreement came up, we would try to spend more time with the group or the individuals who expressed their concern.

I think this would be more effective. It may speed up the process too. I would not advocate that as a method of clarifying the process and subsequently it may speed it up, but I would not see any way of compressing this process into say a six or even an eight-month period. Master planning a land use plan and noise abatement program is a critical process and I don't see how you could do it in less than, let's say a very minimum of three years.

MR. ROBERT CLARK: First of all, I would like to say I think that Mr. Eschweiler's presentation summed up what I perceive as being the type of approach that works well if you have the type of, if I can use the term sophistication of local government to be able to get the job done. It has worked well in some communities I am familiar with but, first of all, I would like to comment that most of the situations I have been involved in in eastern North Carolina deal with small G.A. facilities. We are dealing with a situation where we have a full-time airport manager who is 90 percent ex-Marine pilot and who has perhaps 10 percent of his day devoted to administrative-type tasks.

He spends the rest of his time trying to keep the facility maintained and keep the fixed base operators happy.

The type of local governments that we deal with are quite frankly not very sophisticated and this has been one of the most difficult aspects of the programs I have been involved in, is that it is very easy to subjugate the whole process by only a few protests, not a lot of protests, but just a few that have given me some objections. My perspectives may be of some help to the smaller based facilities more than the larger ones.

I think the presentation he just gave is very good and, as I say, is very typical of what has been done nationwide when you could do it. I do not have any questions at this time.

MR. ROBERT MILLER: I guess I would like to start off by commenting on your initial question, and that is I think that the planning process, as it basically was done 10 years ago, was kind of a closet operation and speed there was something which was achieved but at the expense of leaving out very important parties. I think the days of that kind of planning, as we have heard from almost every speaker here, are over with.

It is an educating process and that is a slow process and there is going to have to be considerable effort. It has become a much more full-time job, if you will, to get a master plan planned and adopted.

With regard to some other comments which have been made earlier today and even some yesterday as well, there has been a lot of discussion about the value of Ldn's as a descriptor around small airports and its applicability to situations where there are a few number of loud jet operations. I guess I would like to comment that I do not really believe that it is as inappropriate as it has been characterized here. Primarily, I guess I draw attention to the charts that Bill presented. We saw there that about three to five noisy jet operations per day are equivalent in level to something on the order of 300,000 operations per year by a quiet aircraft. Well, that is an indication of the extent to which Ldn will deal with noisy operations and will highlight those as being an important factor in the noise environment.

Also we heard a lot of comments about the distraction from touch-and-go operations and they are sort of incessant occurrences and that kind of gives another indication of how there has to be some measure which includes the combination of both high levels and frequent occurrences. So I think I would like not to have a metric instead of Ldn downgraded for the purposes of doing many of these evaluations. I think it is still a very valid way of looking at airport noise.

MR. JESSE BORTHWICK: I have just a couple of points, I guess. Perhaps the most important -- I am always happy to see people gather like we have gathered here to exchange information and exchange experiences because I think that is the true learning method. That is what NANCO is really all about, communication. Communication and noise control officials, back in the early '70s, quickly found out that working independently and running very rapidly in the dark does not work too well and it is much better if you can learn from each other's experiences.

So we as an organization are going to try to get case histories out as were presented this morning by Bill and Peter. I think we can all learn from their experiences and they have been bottled up too long. We have not been familiar with what our colleagues are doing and it has stymied the growth of comprehensive programs. So I think this is a good experience and I think we need more of sharing of experiences in whatever fashion we can use.

The other point that I had, I was unable to be here yesterday, unfortunately, but something I see missing from the agenda is the presentation to you as planners or to those of you who are working in the field, I see missing the presentation of simple planning tools that you can take back to your office when you leave the conference. I think that is something that is extremely important. We need to go back and actually sit down at our desks and start working on a problem and have some information that will support our work.

I do not know how many of you are familiar with the handbook that FAA has put out. I'm not that familiar with it. I have used it but I have not actually applied it. The title of it is Handbook for Developing Noise Exposure Contours for General Aviation Airports and it is fairly simple to apply. The fine tuning of it is perhaps not as simple, but it is a fairly simple approach that can be used by what I would consider a non-acoustician and is very important from a planning standpoint. I know there are much more complicated models available and they have their application. But in terms of planning, I think the general models often suffice and we usually do not plan because the models we are told to use are too complicated; we don't understand them. That is one point.

And my last point, I noticed in Peter's conversation that he was talking about the interstates around the airport and their concern in the planning process with their carrying capacity and their access to those facilities. The pet point I have here is I often go to ANCLUC meetings and other meetings that have to do with airport noise and compatible land use planning and often-times there is an interstate next to the airport that is probably generating just as much noise in fact as the airport and nothing is either done or mentioned about the impact from the highway. So I would encourage you in your planning process to consider all of the major noise forces, both surface and air transportation.

Again, there are very simple models or tools available for the application I am talking about, tabletop models that you can apply one afternoon and come up with a reasonable estimate of what your problem is. And that is really all I have.

MR. ESCHWEILER: The first panel member asked what would we do differently or what we learned on the program. In our case, I think we would push to see that the lead agency, as far as administering the master plan, was not an engineering department. The attitude of our engineers, and I worked very closely with them, but, as John mentioned yesterday, the public is the enemy and there is always that feeling that you are giving up too much if you even begin to cooperate with them.

Secondly, we found very quickly that if you are calling it a noise study you had better have microphones and tape recorders out there because the public is going to be looking for them. They want to make sure that you tell them you can do just as well with one or two readings on a computer model may be true in an engineering sense but it certainly is not true in the case of public acceptance.

Thirdly, if I had my choice of the two agencies for public participation support, I would turn to EPA rather than the FAA. EPA administered a program for us on water quality planning and it required a public participation element in there which makes the FAA program simply look sick.

DR. BRAGDON: Any other comments? If not, are there any comments from people from the floor?

MR. GALLOWAY: I would like to make two separate comments. One of the statements was made first, earlier this morning, and was a question of well at NBAA they were shown colors and things like that. There is a lot of hope engendered that small aircraft noise levels will come down. They probably will come down somewhat but the fact that is continually overlooked by as lot of people in flying is that there are roughly 200,000 aircraft in our current inventory. Attrition is very, very small. The attrition of prop aircraft is not over four or five percent a year. But it takes a long, long time to lower the prop aircraft noise level by 10 dB a year or before the aggregate of this fleet can come down. You can go through the thing yourself and you are going to see the levels you have got now and those levels are going to be representative of the fleet at large for a very long time.

Now, that is for prop aircraft. Take the picture for jets and it is totally different because of the vast addition, great addition of this quiet aircraft.

The second point, apropos, of the comment which considered highways along with airport noise. The new HUD regulations require that you look at all the sources present, not at airport or highway or something else. Levels of acceptability are determined by the contribution from every source in the community. I think that is the way it ought to be.

MR. JOHN R. JANSEN: Dick Jansen -- I am with the Southern Regional Office of the Department of Housing and Urban Development. I think inadvertently someone slipped yesterday and said that the HUD noise standard is 65 Ldn. According to the new Part 51 noise regulations with HUD, at the regional administrator's discretion HUD will issue a mortgage insurance for noise levels as high as 75 dB, and this is important especially in terms of what Mr. Eschweiler said, that not only is one of the criteria determining whether a 75 dB area will be allowed to be developed under FHA mortgage insurance and whether or not sewer and water lines are in place in the area within a two-mile radius. So if the local planning agencies are able to, by their own land use planning and desire, keep an area free, one of the ways that they could keep HUD out is to keep water and sewer out.

So the point I want to make is 75 is allowable at the discretion of the regional administrator.

DR. BRAGDON: Just a little added point to that whole issue of capital improvements. We talked yesterday about what can planning do and the issue of capital improvement is probably one of its strongest legal tools. If any of the panelists have any comments to make, please do and then we will go on to the next speaker.

MR. CRITCHFIELD: I would like to make a comment about Bill Galloway's comment about the longevity of the present fleet of general aviation. This is one of the things we have been looking at. Also we have been looking at bent tip propellers that come in under aircraft conversion, and we have looked at muffler stacks that will fit on the aircraft.

Here we get tangled up with the FAA in the aircraft engineering branch. We think there might be a lot of AFCA market products that could be applied to that old aviation fleet that would improve the noise characteristics. If there is anybody out there who has got any ideas on how to deal with the aircraft engineering branch of the FAA or if they have got any ideas on AFCA market products, I wish they would let me know because we are working on them right now.

MR. DELINO: One of the techniques we have been successful with is allowing each community to determine its own criteria and level through analysis, first of all noise complaints, public opinion surveys, through a workshop and, of course, education on what exactly is noise and what noise supposedly affects people across the world. What I would like to ask, especially from someone like Bill Galloway, what is in the future in this sort of approach? And to ask some of the panelists who have had to deal with the public, how is it working with national standards, worldwide standards actually because the criterion levels do come from worldwide surveys. How do other people feel about allowing the individual community to determine what is an invasive or impinging noise level?

MR. GALLOWAY: Hopefully, in the very near future there will be issued an American national standard on land use and compatibility with noise. I think we are on the seventh revision.

DR. BRAGDON: Seventh revision.

MR. GALLOWAY: In this the recommendation is indeed, it is the local community's responsibility to decide where it wants to be. There is an appendix to this that suggests ranges of definitely compatible, marginally compatible, clearly incompatible, applications according to noise levels compared to noise levels of different land uses. But it is urged upon the communities to adopt for its own purposes within its particular set of strength where it wants to lie in that range. Hopefully, this one will get passed.

MR. JACKSON: Could I comment on that one second. We were recently involved in some work up in Norfolk which dealt with that particular question, in that someone in the community said that, first of all, they have got a

noise problem. We can recognize that, straight out. They said, well, can we do something that is not quite as bad and tried to address the question of abridgement of standards, if you will. The one observation that we have on that at this point is that over the time our study has been going on and it is now in the very final stages of completion, there has been in that community, and I think I have observed fairly widely across the country that the same thing has occurred, as people are becoming more and more aware through the various programs which are promulgated basically by EPA in terms of information on noise in all categories, not just aircraft -- motorcycles, cars, take your pick, anything -- the more people have become aware that they can complain about these things and that these things are damaging to their health in some form or other, the more they are starting to complain about it.

So my suggestion here is that had we taken surveys 18 months ago, two years ago to determine what the standards in that community may have been, my suspicion right now is that those standards would no longer be applicable to that particular community because of the changes that are now taking place.

DR. BRAGDON: So, you are talking about sensitivity as a key changing factor?

MR. JACKSON: Right.

MR. THURMON THOMES: My name is Thurmon Thomes, Regional Civil Engineering in Dallas, Texas. I will address my question to Mr. Bill Critchfield from Torrance. Was the hospital that you mentioned in your presentation already in existence before you started your noise tests?

MR. CRITCHFIELD: No, it was not. The noise program, as such, was after the hospital but we were aware some 8 or 12 years ago of the noise problems that general aviation was developing. One of the things we did, and thank goodness the city council and city staff backed us on that, was we made it one of the conditions of the land use change for that parcel that the hospital would be acoustically treated to certain standards and there was a show down over that because a hospital is very sensitive to the community, and you are talking about motherhood and apple pie and God and country when you are talking about a hospital.

But we got the full backing and the hospital finally decided all right, that they would do it because they wanted that site. They did it and are happy with the results.

MR. THOMES: Approximately how far is the hospital from the runway?

MR. CRITCHFIELD: About 2,200 feet perpendicular from the runway site.

MR. THOMES: Does this hospital by any chance have any funding capability from HEW, or is it strictly a city-county thing?

MR. CRITCHFIELD: As I recall, there was some funding from HEW; yes.

MR. THOMES: Now for the purpose of my question, in the Department of Defense, just like you in general aviation airports do your studies, we do

make certain noise studies which are sent to HEW for their verification of schools, hospitals, nursing homes, et cetera, that might be close to our airports. I just wanted to find out, did you get something out of sound attenuation beforehand or you first approved the hospital facility's aspects of how much sound attenuation they needed with HEW?

MR. CRITCHFIELD: HEW, to my knowledge, was not brought into it at any point in time. They may have been aware of it. We did all of the negotiations, poker playing, if you will, on our own -- based on our findings and based on the consultant's findings that worked for us. And we said, basically, if you do not want to come play with the standards then we will do everything in our power to prevent you from building this hospital at that location. We never got to the point where we had to discuss it with HEW because they complied.

DR. BRAGDON: Okay, John.

MR. TYLER: I would like to comment along the same lines of several comments that have just been made since the question period started. The air carrier field, the industry, is able to predict with a relatively high degree of accuracy what the noise levels of future aircraft will be from one generation to another. And looking down the road we can see some noise reductions in the generation of aircraft to be built in 1990, beyond the generation going into production in the 1980's. This type reduction is relatively small. We are getting down to the point where we technically cannot predict significant noise reductions beyond that point.

The aircraft to go into production in the 1990's will undoubtedly be in production for at least ten years because it takes at least five years or more to pay for the tooling. You have to have that span of product to make it financially profitable. Those aircraft will then be in service for at least ten years beyond the point where the production stops, which means that they will be in service through 2010, probably to 2015.

The general aviation aircraft turnover has historically been slower than the air carrier change in their use of technology and continuation of service. So we could probably make some fairly reliable predictions as to what noise impact will be around general aviation aircraft well into the next century, perhaps to the years 2020 and further.

Looking at the question which is part of this morning's discussion, which is preventive measures, we now have a relatively large number of general aviation airports which are scheduled to have increased number of operations. If you look at the general area forecasts, you can pull out individual airports which are expected to increase their capacity by two times, three times, four times, six, eight, even ten times capacity between now and the year 2000. Many of these airports at the present time have no noise problems.

If you draw a contour at 65 Ldn it will not extend significantly beyond the airport and in many cases the land that will be covered could be used for different types of purposes.

However, if you look at the 65 Ldn contour, let's say projecting it to the year 2000 so we have a number to work with and then just judiciously project beyond that point, we can envision some rather severe problems. Now,

when we have environmental impact statements that are made with regard to proposed airport changes, we think in great detail about land use around the airport. What would be highly desirable, I think and I would like to have a comment from the panel on this point, is if the airports project their expansion plans to the period beyond the year 2000, draw contours which they believe will be the ultimate contours for that airport as far as they can see in the future, and this means that the 65 Ldn would then expand to include a lot of area beyond their present boundaries, an area which at the present time could be properly zoned or perhaps air easements could be obtained to insure that they are not used for purposes which would be incompatible with that future projected aircraft operation.

And then I would like to have comments on the point that when such contours are drawn and the communities around the airport have some reasonable assurance that they could use areas which are not included in that 65 Ldn contour for residential purposes, that airport would guarantee and be willing to have written into their title, property, whatever, that they will not at any time support operations which will produce above 65 Ldn noise level outside of the contours which they have drawn.

Now, this is looking at the problem of the community with regard to its support of the airport, and I think in many cases if we had a guarantee from the airport that they would say this is the extent of our impact and we can go thus far and no farther, then I think you would find community support for that kind of an airport approach and I would suggest that in such a program the airport could be a little conservative from the standpoint of being willing to draw those contours large enough so as to insure that they will include all areas which they would expect everyone to use for purposes, for activities that would produce noise above the 65 Ldn contour.

Now, how would the panel members react to the airport having written into the title of the property the fact that it will never produce noise which is beyond this specified 65 Ldn contour? I think perhaps Mr. Eschweiler would like to respond to that.

MR. ESCHWEILLER: What would be the penalty if I signed the agreement and then did not live up to it?

MR. TYLER: Pardon?

MR. ESCHWEILLER: What would be the penalty if I did not live up to it? My experience with the people who would be doing that sort of thing would be that they would say: Yes, we will sign it but, of course, we cannot commit a future legislature or future elected body, just as I cannot get a budget commitment more than to the determination of my current year. I think it is obviously something that delights a planner's heart, but that it -- I am not sure that you could guarantee a commitment over that kind of time because you are talking about committing land uses to 35 years into the future. You are beginning to talk in terms of renovating land uses at the end of that time span, usually, and renewal.

DR. BRAGDON: How about Bob Clark basing his experiences at Kinston? You did an airport plan and then you have been living with trying to fight off some of these problems.

MR. CLARK: Our biggest problem was, one, we were using a CNR projection at that time. But regardless of methodology; one, the public nor do I believe the city council or airport commissioners believed we would ever produce that kind of noise, no matter what methodology or how far out. And we were dealing with an area primarily undeveloped, about 95 percent rural land; mostly utilities not available; poor soil conditions, as far as septic tanks, if you get anything at all, but rapidly becoming important because utilities are going to be put in there.

The difficulty that I see is that, first of all, and I agree with the comment made here about not being able to guarantee that I think from the airport operator's standpoint, whatever that condition will be 20 years from now in terms of airport noise. I would say that the three tools I have seen that I think will work under the most adverse conditions are capital improvements, programming, and directing development through that method; through purchase of easements, aviation easements in the area in which you are going to operate and potentially operate in the future; and to look into fair disclosure, disclosure of type of problem we can see coming up presently as well as in the future through not only improvement permits, building permits and deeds.

I really do not have great experience in the City of Kinston and Solos Field (phonic spelling) from the standpoint of having all my recommendations accepted. None of them were accepted. None of them have been implemented, and we have had three years now since that sort of fell apart. But it is interesting to see that some of the same things we recommended in the study of what to do about land use control and so forth are sort of coming, starting to come about now naturally.

I do not think it is related to your question originally, but I would like to emphasize one thing and that is land use controls, particularly zoning possibly for subdivision regulations. In the area where I deal with and have dealt with, a number of communities are very conservative, rural property rights advocates, they just do not work and they are not a long-term solution. If you can afford to buy it, put an easement in and run in the utilities. Where I have dealt, that has been the most successful.

MR. TYLER: Are you saying that aviation easements do not hold forever, that they can be revoked?

MR. CLARK: No. What I am saying is that aviation easements can work the same thing in terms of a disclosure. But normally those things do not specify your noise level and I think you will have a hard time doing that. You can make a decent projection as to a most likely severe occurrence and you can work for that, but the question comes back to saying what is the penalty to the airport operator that will help enforce that. It is too easy to, I think, have to fall back on people down the road who may or may not be following a proper procedure.

MR. TYLER: I understand aviation easements are obtained with the permission to produce noise up to a given level. Do you believe that that is not legal?

MR. CLARK: No, I did not say that. I said the problem that I have seen is that the airport operator, in his difficulty to invoke a penalty for that.

MR. CRITCHFIELD: I have to agree with Peter in a little different context. The situation with most airport proprietors, their board of directors are political persons. Most astute political persons on the average will not commit themselves beyond the foreseeable term of their office. So, while the idea of having a commitment, if you will, that you will not from this day forward make any more noise in a given area is nice. I really don't think it falls under the heading of practical solutions.

MS. CALDWELL: I would like to put on another hat for this question, and that is as an elected member of the Town of Greenwich legislative body. With Mr. Eschweiller and I both here, you have an opportunity to get two sides or two viewpoints on the same question. In reference to the noise level that was set for the master plan for the Westchester Airport, our association had tests made in the Town of Greenwich, next to the airport. We had three different installations for a noise monitor. Our ambient noise level is 55 Ldn. Subsequently we went to one of the early planning stages with the master plan and gave them this input. Anything obviously over 55 Ldn is going to stick out like a sore thumb. We really wanted that as a bottom level. What we have wound up with is 60 Ldn. Whether they ever heard us, I don't know. I certainly doubt it, but this is one of the problems you run into in dealing with neighborhood groups. If they give you information and it does not appear to be understood or taken into consideration, then the whole process is somewhat undermined.

I believe that in certainly three or two of the other communities surrounding the airport, two that are now in Westchester County, would have the same ambient noise levels, certainly, in relation to where they are to the airport and what they have for development within their municipal boundaries. That is one comment.

The second -- Pete, I have a question based on this. We have a pollution problem. It is a noise and air pollution problem and we have tried to participate with you to solve that problem. I am delighted to see my master plan for the airport, to see the county do some long-range planning for the land use around the airport. We would like to do some in Greenwich but it makes absolutely no sense to us to solve one pollution problem by creating still another, and what Westchester County is proposing is going to create for the Town of Greenwich a bigger pollution problem very shortly now.

Let me give you some measurements. We have 200 acres right now zoned for residential use that are immediately adjacent to the airport. It is not in my opinion suitable for residential use. It is large-lot zoning, as is most of the other land in Greenwich in that area. When I say large lot, it is four acres a building site. They will probably run a minimum of \$125,000 to \$150,000.

Now this land is currently owned by corporations who bought it unconditionally to try to break the zoning, to put up corporate headquarters. The town and the residents in the area oppose it, not because of its incompatibility with the airport but because of its incompatibility with the residential neighborhood on the other side and because of the vehicle traffic which the local road network cannot handle.

We have now two-lane winding roads. Three weeks ago a pilot coming to Westchester Airport got off on one of our exits from the Merritt Parkway, cut across country using the country roads, hit a kid on a bicycle and ran over a fence. This is the kind of a problem we are facing regularly now.

Westchester County is presuming to rezone approximately 300 acres now and there are 3,200 acres in there for corporate development. Our estimate is that somewhere in the neighborhood of 35 percent of that traffic is very likely to come out of southern Connecticut, the southwestern area. We want to know what guarantees the county can offer us that the local roads in Greenwich will not be used, because we cannot afford to enlarge them and we cannot afford to lose the children.

Peter, sorry to put you on the spot but this is a land use problem.

MR. ESCHWEILER: You are quite right, Joan, with respect to the zone of 300 acres south of the airport. It is a single family residence zone but again Rye, never doing things quite by the book, also has SBO, special business office zoning so no zoning of that land is necessary. All the development proposed for it that we are talking about here would be in accordance with the existing zoning that has been on that property for 15 or 20 years, so there is no action on the county's part to do any rezoning, nor could we because we don't have that power. We are concerned about the flow of traffic, as I indicated in my closing remarks. We have not yet tested this program against an air pollution mode or against traffic engineering mode. I do not know if the interchange we are dealing with can handle that question. The point is, we are responsible to the legitimate land use development proposals of one of our communities seeking an alternative to development that will not route this traffic under King Street, Route 120A, which forms the Greenwich west town line.

I think the audience should know about the American Can situation which is a triangular piece of Greenwich property north of the airport, landlocked in Connecticut and one of the headquarters buildings I showed you is located on that parcel. Access to it and from it is over Westchester County highways and there is no (ratable) in Westchester so it is not always Westchester County deflecting traffic or being the boogie man.

MS. CALDWELL: We did try to stop that but we did not succeed, Peter.

MR. GOODFRIEND: I have two comments. One, Joan reminded me that when we saw the contours for Torrance and then saw the contours for Westchester, it demonstrates the difference in size of contours; same similar aircraft, even a larger number of runways at Westchester but the contours seemed to go out much farther over a much larger area. This is the kind of problem that is very difficult to come to grips with and only using overlays and information of that kind are you going to really see what is happening in Greenwich or Rye or other parts of Westchester.

The other thing I want to talk about is that John Tyler's scheme cannot work where you have this intergovernmental situation. One airport in a town owned by another or three towns or owned by a county government in a municipality I don't believe it can work, John.

MR. RICHARD PROCUNIER: I would like to make a comment on that dialogue that went on. My name is Richard Procunier, EPA, San Francisco. My comment on the land use is a local decision and that is very difficult from a national policy level to send out a directive, whatever that is, and see that that is actually enforced or that it has any likelihood of happening.

The other thing is, Shirley mentioned yesterday the people that I am representing here are the ones that really hold the power, and that is the elected officials, and they are very much an important part of the whole process. And the other comment was that Bill's leadership from the position of being the proprietor of the airport, that he is really there to protect that Federal investment and facility I think is very important; that all the planning decisions and all the other decisions are very necessary and that support is very necessary, but the leadership still has to be at the proprietor level and I guess that is what the courts are determining because that is where they leave the legal liability.

DR. BRAGDON: I would like to impose upon Shirley for one or two minutes to outline her scheme, that looks like it might be adopted, in terms of the accountability question which was raised yesterday.

MS. GRINDLE: It is not a matter of maybe it will be adopted. It is adopted. Those of you who were here yesterday heard me complain that the real decisions, that all the planning in the world is not going to make a bit of difference when you have got politicians who make political decisions. And then I went on to say that politicians are very short-term oriented. Their future is limited to their next election in planning and therefore you have to look beyond that politician's one term. They are more concerned about getting elected.

In Orange County we had the distinction of having the reputation of being second only to Cook County in our raunchy politics. We have had 45 political officials indicted and convicted in Orange County in the last four years. I am proud to say that I am responsible for about six of them.

Those of you who were here yesterday heard me say that I had served four years on the planning commission. By being on the planning commission I happened to get on the inside and found out what was really going on and how our decisions were made. And I went to the grand jury and squealed and we had two supervisors who had been indicted; one tried and convicted on bribery and has been removed from office and I hope the next one will be out within six months.

Anyway, what I got out of it, I realized, as did a lot of the public, that it didn't really matter how much planning you did. In fact, the saying goes in Orange County that planning is like arranging the deck chairs on the Titanic -- What's the point? So, the point being, that if you didn't go to the heart of the problem you are wasting your time. The heart of the problem was campaign contributions, the influence of campaign contributions on the elected officials and the decisions they made.

There is no way the public in Orange County could compete with the big developers and their lobbyists who were good for 85 percent of the

campaign contributions that the supervisors were getting elected by, and we are talking about campaigns that were running in the order of \$300,000 to \$400,000 for a \$35,000 a year job. So, we went to the heart of the problem. I resigned from the planning commission and I headed up Orange County's first county-wide commission. It was called Tin Cup.

The initials for: Time is now, clean up politics. We had 1,500 citizens who collected over 100,000 signatures and it is now a law in Orange County -- what we have done is put an ordinance to the books that does two things. We went to the heart of the problem. We said that if an elected supervisor accepts more than \$1,000 campaign contribution within a 48-month period, four years, from an applicant or his representative, then he is disqualified from voting on that applicant's project. Boy, has that stopped the little games that were going on.

Second thing we did, we said that lobbyists -- we are going to call you something else now. We are going to call you what you really are when you buy votes. You are an influence broker so we said it is okay for you to lobby; lobbying is a very honorable profession if you are not trying to buy votes. But we said if you are lobbying and you simultaneously contribute to a supervisor's campaign in excess of \$250 within a twelve-month period you are now one of those dirty SOB's called an influence broker, and now we are going to limit you to \$500 total within a 12-month period to any or all five supervisors.

We have essentially put the lobbyists out of business in Orange County. They have been a big influence in Orange County. About half a dozen of them who were literally giving anywhere from \$30,000 to \$50,000 in loans to supervisors for their campaigns. That buys a lot of votes.

Anyway, the ordinance has passed. We qualified the matter for the ballot and the board of supervisors then had the option of either adopting it or putting it on the ballot. They didn't want me rubbing their nose in it for another six months so, at my urging and their better discretion, they went ahead and adopted it. It is now a law. It has been in effect for seven months.

We are tracking it. We don't trust the foxes to guard the chicken coop so we are tracking the ordinance and monitoring all campaign contributions. We had everything put on a computer system and now if anybody wants to know how much money is being given who, what company's on which board of directors, blah, blah, blah, we can tell you. Essentially what it has done is clean up their act and the net result is we hope to get better decisions out of elected officials because we hope we have removed the influence of large campaign contributions.

We want them in a position where they are as responsive to the public's interests as they are to the major campaign contributors'. Time will tell. I cannot guarantee that we are going to get that. If we do not, then the next election we are going to run will be for a single term only. In fact, I advocate that for all officials. They should be in office for one term. All the terms would have to be lengthened from what they are now, but I don't think we need to put up with reruns and that is what a lot of politicians are, who make a lifelong career out of being in public office. Any questions?

MS. CALDWELL: I would like to add something. The Government has given us help. The Federal election laws say that whether you are voting for the President of the United States or a mayor of the town, they are limited to \$1,000.

MS. GRINDLE: I could not hear your question.

MS. CALDWELL: The Federal disclosure law now requires that you give no more than \$1,000, regardless of whether you have just come through a campaign --

MS. GRINDLE: It is \$5,000, is it not?

MS. CALDWELL: No, \$1,000.

DR. BRAGDON: Ken, do you have a comment?

MR. DELINO: I would like to comment on being a technician working in Shirley's environment, because I was a city planner while Shirley was a planning commissioner. One of the things we learned from that experience was to try to get some commitment during any study from the executive branch of the Government and one of the techniques I think Jesse down the table was asking for was how do we actually, what techniques do we actually use.

One of the ones we have been successful in, in some of our projects anyway, is writing into the work scope a decision point for an executive committee comprised of elected officials. Now usually they are the ones who sign the contract and it has worked in some cases and it has not worked in other cases. But if we can put into the work scope a decision point, either a recommendation process or a decision among the alternative for the elected officials, we have found that we have kind of bypassed some of the inertia that results in this political process.

And that is a direct result, I think, from -- well, our whole firm has worked under the system that Shirley has been describing to you and it is one of the ways that I think can be used to help bypass that.

MR. LEWIS: Joe Lewis, Town of Hempstead. One thing I was very happy to see is that there was much more awareness on the part of everybody that the public has to be brought in at the beginning of programs that will wind up affecting the public. If we can bring one unnamed Federal agency up into the twentieth century to accept that, I think we will really be making some good starts.

Another thing I would like to comment on is that Lew or Bill was talking about the complaint numbers being set up for people who call in complaints. We have ours at Kennedy in the sense that it is really defeating the purpose it was set up for, because of the fact that the people answering the phones evidently have not been trained on how to answer the phones. I mean, when you get some irate person calling up to complain about the noise or whatever and to have the person on the other end say: Well, look, all I am here for is to take your name and telephone number and that is it; I don't care about the complaint.

This is not the way to gain friends and influence people. So, I think it is important to bring out that when a telephone number is set up, the people who are going to answer the phones have to be specially trained to handle those calls.

And then -- I forget now who it was who made the comment about pilots resenting the inference that they have deficient technical skills. I think it was you, Bill. I know from the activities at Kennedy Airport there are some pilots -- and I am talking about commercial pilots -- who I question how they are keeping their licenses.

The third thing I would like to bring up is the insulating of buildings. Now, I personally do not buy that route and I will tell you why. It is fine to insulate a building and while the person is inside the building, fine; he doesn't hear anything. But he does not spend all of his time inside that building. My theory is if they complain after the building is insulated, the FAA particularly would come back to them and say: Look we insulated the building -- now what are you complaining about the noise for? This is not a route an irate person would recommend.

Also one other thing. Peter, I think it was, was talking about rather dealing with the EPA than the FAA. I agree with that one million percent.

MR. CRITCHFIELD: In response to your comments, the Western Region of the FAA has been somewhat sympathetic to what we have been trying to do. One of the reasons I guess is because the regional director flies his own aircraft off of Torrance Airport. Your second comment, I think, dealt with pilot efficiency.

MR. LEWIS: Pilot deficiency.

MR. CRITCHFIELD: Okay, pilot deficiency. This is one of the things we do. We appeal to the pilots, in executing noise abatement procedures, to their sense of professionalism. I say if they really feel they operate the aircraft in a professional level, then they will look at these procedures and see if they cannot phase their professional operation into that.

In terms of the other thing, about the complaint line; yes, we do try to be sympathetic to people and find out exactly what their problems are. Naturally, when we have the tape on, the tape is not very sympathetic. But if they do leave their numbers, we follow up the next day to get more information. I cannot remember what the third one was.

MR. LEWIS: I am not trying to say that Torrance is not doing the job. In fact, I think they are doing one hell of a job and I would like to see what we could adopt and use in our area. The third thing was the insulation of buildings.

MR. CRITCHFIELD: Okay. No place else -- well, maybe that is the wrong approach. I cannot think of other places except maybe Florida, the southeast and southwest southern coastal areas of the United States, do you have such a lifestyle as in California and acoustic insulation treatment is not going to deal with it. It is more intended for the critical use areas -- hospitals, meeting rooms, examining rooms in doctors' offices, conference

rooms, rooms in commercial industrial centers, some acoustical treatment of houses. But obviously, you are not going to deal with a guy trying to barbecue on a Sunday afternoon in his patio. There is just no way you are going to get around that.

MR. LEWIS: That is what I was thinking of primarily, the ones that go out to the pool and the backyard.

MR. CRITCHFIELD: On adjusting the contours, I would leave you with this old adage, sort of following up on Shirley. It is an admonition to traffic engineers. You know, when a group of residents comes in and wants to put a stop sign on a particular corner and your warrant system shows that it is not warranted, you can be assured that your political body or your city council will place that stop sign on that corner over your bleeding and technically correct body.

ATTENDEE: Question for Robert Clark. You said there were recommendations that you had which were not followed. Was that with land planning that they would not be followed?

MR. CLARK: No, actually it was the full gamut of the recommendations to the local government involved. There were two to three operators who were actually in control of the local government who did not admit any of the recommendations, ranging from sound impact, runways, buildings, landings, all the way to the state legislative action, that were necessary to get state legislation to do some of those things. Is that what you are asking?

ATTENDEE: Well, the specific land use procedural recommendations that you made, it just did not work? You gave them as an expert and you say they did not work or they were not accepted; which were they?

MR. CLARK: They were not accepted by the local governments involved in implementing the program. There were a lot of reasons why they were not accepted not related to the type of the program. They were based on political aspects as to why they were not implemented.

MR. CAMPANELLA: My name is Angelo Campanella, by the way. I was going to say that sometimes introducing a term into the language can have a great deal of influence on public policy; for example, the person who introduced "beat the box," I think did a great service to somebody by that term -- I am not sure that that was noise abatement -- the implication being that a pilot will fly in an unsafe manner to beat the box. Therefore, noise abatement and safety are anti.

I think the same thing happened with "ripoff" instead of stealing, and a lot of things like this in society. I was going to question whether we should introduce the term, "break the box." Now, how do you catch the person who is deliberately buzzing or making noise in a particular location? I am wondering if in fact -- and the question really is not mine, it came from somebody else in the EPA -- is there a strategy that we can use to influence the pilot who is interested in beating the box or -- really, I think Bill mentioned there is a small percentage of pilots that really are trying to fly loud. So short of a big monitoring program, expensive one like you have, or some other way, is there some way we can use specifically peer pressure? That

is the question. Can you use peer pressure through your pilot's organization or somewhere else to really try and influence the person who is trying to beat the box or fly in a very noisy, deliberate manner?

MR. CRITCHFIELD: We think so. In fact, a part of the success of our program is based on the peer group pressure. We have gone to several different pilots' organizations and explained to them. Civil Air Patrol, for example, is wholeheartedly in support of our noise abatement program, and in terms of their air search and rescue safety records they have a very good influence in terms of peer group pressure.

The local pilots' organization -- one of them is primarily a social organization and it does not have that much influence, but the pilots belonging to this subscribe to our suggestions. They evaluate their aircraft and they look at it and they say, for example: Hey, I think Gordon said this morning that the departure was rather steep shown on our Jeppeson insert. We suggest the best rate of climb for many reasons; number one, better visibility, better cooling, more comfort, and best angle of flying. But we do not say best rate or best angle. We just say to climb as rapidly as possible because some people feel more comfortable with best angle.

The demonstration grant we are working with, Region 90, included a provision for peer group counselling for people who had problems operating their aircraft. One of the things we wanted to develop was: If a guy flies a Skymaster and he cannot seem to make it and there are other people on the airport that own and operate Skymasters, we felt we would get them all together and find out what type of techniques these other guys use, apply these techniques so the other guy can fly this Skymaster quietly. This is peer group counselling rather than pressure.

We feel both of them are equally reasonable and productive.

MR. CAMPANELLA: I regard pilots in their behavior. I have been flying 15 years now, have about 2,500 flying hours, owner of an aircraft, and I think of those groups and I think I am representative of them. I am not sure, but I don't think they go out there and do these things purposely. I don't think that is in their psyche. I think it is more a matter of almost carelessness.

A good example is the handling of the rpm control. The prop itself is really an rpm control, as everybody knows. We in the room know that the higher rpm makes more noise. The pilots who would leave it in high rpm too much, all the time are the ones that would be making the most noise and they would not be doing this purposely because part of the pilot training, when you are in the city, full forward, full rpm is a safety measure. This is basic and most instructors will tell you this was the way it was in the past. It has only been in the last two years, perhaps -- I know the last one year -- that general aviation instructors got out the message that this is not always the best way to do it around airports because of harrassment in the community. So I don't point to the pilots in saying these guys were doing it like some teenage hoods on the freeway going around without the tailpipes on. That is not the case.

MR. GREEN? I was not referring to the vast majority of pilots. I was referring to that very, very small percentage. I assume there is only a very, very small percentage that ever try to beat the box.

MR. CAMPANELLA: I wouldn't bother to tackle it because it is not there. It is errors of omission, not commission. They just do not know that this is going on.

MR. GREEN: There are a couple of points that I think are very valid we are trying. There is a lot more information being put out in the new pilot handbooks now directed simply to the issue of noise control, how to fly your airplane quietly, but we do have a few recalcitrant type pilots and I would disagree with Angelo on that point. There are a lot of guys that flat hat and they like to go under the bridges and a few other things. I am not going to advocate this procedure, but it was a very successful one and it in part is based upon the experience that came out of Torrance, I think.

They have an internal counselling session, kind of program going on and perhaps Westchester is a close second, if not equal. But the system works, peer pressure works.

There's the theory of why one guy, one particular guy who was flying a Bonanza, which can be flown quietly as well as noisily, why he flew at maximum continuous power -- and a beautiful pilot technique -- exactly 1,000 feet above terrain, barely within human possibilities of a human pilot. It was determined he was doing this to impress some of his friends. He happened to be a doctor -- you cannot say they are responsible members of the community -- but his friends, fellow pilots, determined that it was due to the fact he was excessively dirty. And at 3:00 o'clock in the morning, with an ice cold shower and some of the same brushes one uses to scrub floors, they removed that dirt.

And after some thoughts about lawsuits -- he was going to sue them all -- he calmed down, straightened out to save his skin, literally, and flew a little higher. That is an extreme case of peer pressure, but it was a very severe local problem with this one doctor in that community and he was the cause, perhaps more than 99 percent of all the flying of the inadvertent type where they made more noise than necessary.

That demand near doomed the runway extension program and the resurfacing of what they call the taxiway, which I call open woodland, head one. One guy damned near killed that whole program and it was a severe case with perhaps a severe solution but the real point is that there is something that can be done to the guy that does not know how.

And remember the point that Angelo made a minute ago. We were taught to pour the coal to it in the vicinity of the airport because, boy, I got to go around. You've got the power there and you know it and you keep the power on and many aircraft -- and we are getting into other issues on fuel conservation now too. We are rethinking the kinds of things we thought we needed for safety and I am asking the question, do we really need that power for safety. And where we find we can do without it, we are cutting it back. I will get into that tomorrow a little more on my talk.

AFTERNOON SESSION

October 4, 1979

2:00 o'clock, p.m.

DR. BRAGDON: We are going to have each of the participant panelists spend up to five minutes making an opening statement in terms of what their feelings are in terms of the regulatory responsibilities. We purposely structured this panel to represent a diverse group of interests from the governmental sector, so we have Federal, State, and local people being represented on this panel.

Then, as you can see from your program, we have people from the private sector and these people will all get together and attempt to discuss their perspective among themselves, at which time we will then open it up for any type of dialogue for as long as you want to go. Again, I have one other comment; that since the remarks are being recorded, we would like you to indicate your name and essentially your affiliation so she can put that down on her tape and so we do not lose that information later. The proceedings will be published with the person's name indicated, so you get either the appropriate credit or liability for what you have said -- depending on what your position is.

I would like to have those panelists come forward if they could and we will arrange ourselves along this front barrier here and I would like to introduce each person.

We will go through some brief introductions. The first panelist is Herman Bernard. We have been discussing this morning politicians' interest and involvement in land use planning and the need for accountability, so I think you will get some interesting questions today. Herman is City Councilman from College Park, Georgia and is on the Board of Directors and serving as President of N.O.I.S.E., National Organization to Insure Sound Control Environment.

I might add that there were some brochures and still are of that organization on the back table.

Next to him is Stan Green. Stan is Vice-President of General Aviation Manufacturer's Association out of Washington, D.C. and has been extremely involved in the general aviation industry in trying to fill orders which, presently, are a little behind at this time.

Steve is lost somewhere and we are trying to get him down. Steven Schwenk, who is appropriately of the National Pilots Association, so he is stuck somewhere up in the atmosphere. No, he should be here and we are trying to get hold of him.

Bob Montgomery. Bob is with the State Aviation Administration for the State of Maryland and represents that sector from the state's standpoint and has been active in airport noise in that area.

Charlie Blair, our second representative from the FAA. Charlie is with the Region 4 office, Atlanta, is an airport planning specialist and he will have a lot of comments, I am sure, today.

Next to him is Maurice Gosnell. Maurice is President of the Pilot Lawyers Bar Association and is located in Lawrenceville, Illinois.

The last person -- his name tag is incorrect -- is Fred Gammon. Fred is Airport Manager for Teterboro Airport in New Jersey.

So what we would like to do at this time, starting off with Herman, is to make an opening statement and we will go down the table to have each panelist make an opening remark, after which if the panel wants to discuss among themselves or comment on each other's remarks, they may, and then we will go into an open discussion among all the people that are here. I am sure there will be plenty of questions to go around.

MR. HERMAN BARNARD: Thank you, Dr. Bragdon. I might say that I am Herman Bernard, representative of the City Council, City of College Park. Most of you might not know it is a part of Atlanta Hartsfield Airport. Hartsfield Airport is in the city of College Park, so we have for a long time been well aware of the noise problems that beset the busiest airport in the world. I'm also, as Dr. Bragdon said, actively involved in a national environmental organization known as N.O.I.S.E., as he so stated, presently serving as president of this organization. I do feel like there are some things that can be done to assist general aviation and I will make a couple of brief comments on it.

In response to our organization and our need to organize some ten years ago, we saw the real problem as being not the general aviation but the type that you see around O'Hare, Atlanta Hartsfield, Kennedy, and major airports like this. General aviation has not caused a whole lot of problems to the people involved in our N.O.I.S.E. organization at this time. However, we begin to have some interest, from the standpoint of College Park and from representing the citizens of College Park.

We do not have this problem particularly in College Park. We do have some general aviation at the Atlanta Hartsfield Airport, but a big part of it is moving out and I understand most of the rest of it will soon be gone. Of course, we, as neighbors of the second biggest airport, are glad to see this happen. We think it probably should be rerouted and moved to some other type of location or some other location.

There is a question on what can be done about regulating general aviation, as well as any of the aviation problem. Is it permissible?

Most of you here I am sure know that general aviation, like others regulated by the Federal Government, FAA, we find that there's a lot that can be done, but it really cannot be done from the local level too much; however, there are some things that can be done. There are more things that can be done with a sponsored airport, of course, than can a non-sponsored. What I mean by this, College Park, of course, the airport is in College Park. However, we are a non-sponsored city. We do not have any control,

particularly, except that that we can pass through our ordinances, that would stand up in court.

We do have a noise ordinance in College Park that we have had for some time; however, it is limited as to what control we can impose on the traffic at the Atlanta Hartsfield Airport.

One of the basic remarks that local government might make is when you start a new airport, in relation particularly to general aviation and if it is in your jurisdiction -- and then of course you do act as a sponsor, the city -- you do have some control. Local government, of course, can set up zoning restrictions and permits and et cetera. This would give you some control over what happens. Most of our problems at this point have been after the fact.

The industry has grown so rapidly that before we realized what had happened the noise had infiltrated into areas that were being lived in by people. Some of them have been there for many years.

I find that one of the objections that I have as a city councilman is that too many people -- and you might have heard this on the panel this morning -- is that too many people in the planning departments have an opposite view and concept of what I do as a representative of the people; in that they suggest that you, through planning and this type of deal, move the people away from the noise. But from a political standpoint, representing people that have been there since the early 1900's, and of course College Park being a perfect example by being chartered in 1892 -- a lot of these people feel that they were there first and maybe you should begin to move some of the noise away from the people.

Some planning and zoning and these type restrictions do not work particularly well in a fully-developed city like College Park. We have approximately nine square miles of area and that is relatively small for 27,000 people. Our city is already developed and has been before the jet age, so my feeling and my position has been, as a representative of the citizens, to do what is possible to move the noise away from the people. I realize that is not particularly good planning but there are things that can be done.

Of course, you have more control on noise generated from the ground, run-up noise, this type of thing, than you do when the aircraft leaves the runway. Then it begins to be the responsibility of the FAA and there have been some tests over this in the city of Santa Monica as to what can be done, what local government can do to alleviate some of the noise and set some restrictions and so forth.

However, I will not go into that in depth at this time, but we are watching this case with interest. The lower courts have ruled in favor of the people in that city. The responsible city does have to do certain things in helping to alleviate some of the unnecessary noise around the airport. So our organization, as well as myself individually as a representative of the citizens of College Park, we are looking and searching out means and ways to allow us to do more to alleviate at least the unnecessary noise.

Now planning, as I stated before, is one thing and all this will work good in some areas of our country but it will not work in College Park. I might say that Dr. Bragdon, of course, is very familiar with our situation in that some years ago he did a study of our problem, so he probably is as much aware of the situation out there as I am; maybe more. We do feel like there are some rights that the people have and with certain ordinances and controls we feel like some help can come about. Thank you.

MR. STANLEY GREEN: This is Stan Green again of GAMA. Under the general heading of regulations that we have got is a topic I have got, somewhat separate, but obviously linked into the topic of general aviation noise.

The issue I would discuss is, I think most of you are aware that the FAA regulations are virtually identical to the ICAO, the International Civil Aviation Organization regulations. This was not done by chance, this was done by a design issued by us simply because we export aircraft and we cannot afford to have different countries have different certifying regulations if we are going to be able to sell a product.

This type of situation has resolved itself in the international field fairly well with the continuing pressure from particularly the Europeans who are about ten years ahead of us in handling noise problems. We feel that there is going to be some reasonable continuing pressure on the regulations and as long as it is done in a uniform manner -- from our strictly monetary point of view, the costs of certification -- we will be ahead of the game.

However, when you get to the United States, with respect to the airport situation, I think we also need uniform regulations throughout the United States; regulations that are applicable to all airports, particularly, or at least airports that have received Federal funds. Now, this does not mean that the same noise level necessarily would apply to each airport. That would have to be determined on a fair and reasonable basis at the local level. We can find no solution to a question that was once posed to me: What if we can find the money to buy out all the people; where am I going to put the 490,000 people from Nassau County that we were going to move away from La Guardia? There are no solutions to that, no practical solution.

So we have got to adjust to the local issue, in most cases the local problem.

The noise levels must be calculated by the same methodology. They have got to be sure and certain that a pilot can meet them before he sets out on a trip. The noise levels obviously must be reasonable, compared to the local conditions. Many times we cannot afford to cater to the idiosyncracies of a few airport neighbors who think that their automobiles and trucks and lawnmowers have a right to make more noise than airplanes, and this is perhaps a rather keen quote. There's a regulatory proposal that was made by the Air Transport Association, but published by the FAA as an advanced type notice of the proposal we are making, and while the proposal as written would apply only to air carrier airports, I think it could be expanded and would suit the needs of all the airports in the United States with respect to the planning and

promulgation of definitive noise plans for each airport on a fair and certain basis for everybody.

On another point of the -- I would like to somewhat answer a question that was raised yesterday on why our airplanes seem to be ahead of the FAA standard itself in propeller-driven aircraft noise. The key to all of this is the fact that we have a reasonable regulation on the books. That regulation was developed to be in accordance with basic technology. It was developed in accordance with not only U.S. but with European data, and it stands as a cap -- noise cannot escalate above the levels -- and that particular regulation goes from 68 dB, from the lightest weight aircraft on up to 80 dB.

The key as we see it in this regulation is another piece of law, not that part under which the regulation was written but the part that says: in each individual aircraft type certificate you will strive to reduce the noise of that airplane type as low as practicable. And that means if you can beat the limits in the law, you do so. But you have got to remember too at that time that the standard itself is a broad-based one. It covers aircraft with different payloads and types of engines. The same basic engine may be in two different airplanes, and the noise of those airplanes will vary because of the different ways that they can be operated.

The techniques that are used to make one aircraft quiet will wipe out another aircraft. It will cut its payload by a quarter to a half of what it was, increase fuel usage and cost about 30 percent more to buy.

The key to it, I think, is an analogy that I would like to throw out -- if I can find the beginning of it here. Let us assume we had a shortage of cloth in the United States and the clothing protection agency studied the problem and came to the following conclusions based on its report; that the lack of suitable cloth for clothing the population could cause a health problem in the United States, primarily in the north where the cold weather is experienced. There is much wasteful use of cloth in the manufacture of various styles of clothing to suit the purported needs of people and, therefore, the fisherman, the business person, the farmer, the construction worker, and the secretary are all going to wear the same style and type of clothing.

Further, the clothing is now made in all different sizes, some of which use more material than others. and since we note that there are some suits and dresses made in smaller sizes, size seven for women and size thirty-four for men are going to be the standard from now on for all suits and dresses.

I propose to you, ladies and gentlemen, that the reason that the Cessna Citation can make its noise level is based upon not the technology that was used, that is available to the 747 as well, but the fact that that airplane is a relatively short-range jet of light weight and if one needs a longer range jet of bigger capacity he cannot wear the size thirty-four suit; he has to use an airplane that makes more noise.

We cannot say that the lowest airplane in the scale is now at the state of technology. It just does not work. We have different aircraft for different purposes. Some aircraft, as I mentioned, with the same engine in

it, make substantially more noise, because they climb slower; they carry bigger payloads, more economical in some fields. They do not go as fast perhaps and they do not serve the purposes of everybody who needs them.

The current technology that we are talking about in the propeller-driven aircraft field is a technology primarily based upon engine propeller combinations. It is the propeller that makes the noise, the tip speed of that propeller. We can add more blades, we can gear the engine and make it turn slower and get the tip speeds down, but these cost money, this takes anywhere from one to three years to develop. They increase the fuel, which is a national goal perhaps in conflict with noise, but one that we cannot avoid working on.

And we can go on. The regulations, FAR 36, of both the turbine and the piston-powered aircraft, propeller-driven aircraft are current technology. They are being made today. The fleet as we see it today is coming off the line in accordance with those standards. The FAR 36 Appendix requirements for propeller-driven aircraft in fact do not come into effect until the end of this year. As a matter of fact, in 1976 all propeller driven aircraft under 6,000 pounds meet the requirements by the end of -- well, in fact by the end of August all aircraft in production now meet the requirements. Obviously, we could not afford to wait until the last moment to be certificated aircraft. Each of the certification programs in themselves is a major activity upwards of hundreds of thousands of dollars.

I have one last piece in the recommended rule making area, somewhat directed at the EPA. I think they are in the wrong part of this business. The industry and the government have spent an awful lot of money and time going into proposed rules that EPA has submitted to FAA, then FAA by law is required to publish and then industry is obligated to comment on it. The majority of the proposals, the vast majority of the proposals from EPA, did not meet the statutory requirements for promulgation of final rules.

I think they knew that. Economics were not considered. Technological practicality was not considered. In a nutshell, we wasted a lot of time.

The EPA proposals were just like my size seven dress and thirty-four suit. They were the lowest sizes made and that is the state of technology and, by God, you are all going to wear them. But there is a rule that EPA, I think, can have and should have and should be following, and I don't see very much of it being done. And that gets into a lot of the basic understanding of psychoacoustics and the determination of what we need, what levels we ought to be having.

In the Santa Monica case, in which I was an attorney of record, participating in the trial, I kept on hearing the EPA has set a standard of 55 dBA on the Ldn scale. I have never read that in any of the EPA documents. I know what the goals say.

An awful lot of rhetoric is passed out and people do not know, people do not understand. Noise is a rather complex issue. We had a brilliant judge in this case there and there were many things that he could not understand and

required repeating and repeating again. There has got to be some simple way that we can better understand the psychology of noise and the mechanics of noise. I think this role should be filled by EPA as its major obligation under the Noise Control Act of '72.

Psychology of noise and its effect on people is not known. If you go back to the levels document and the other reports that came out of that time, you see a lot of questions raised -- but since 1973 we have not seen the answers. We have not seen better-refined questions even, and we sure-as-heck have not seen any solutions. I think EPA is missing its obligation in that sense.

One last point, and it is somewhat along the same line. I think we have got to all better understand noise, in the sense that we have the data reported today. As a result of some questions that were raised during the meetings and some discussions that I have had with some individuals here, I have come to the conclusion that many people, including some who have an involvement in the noise problem, do not understand what those advisory circulars that FAA puts out mean, what certification data means; that certification data, whether you are talking props or recips or rather jets, specified conditions the airplanes will make this much noise and unless you duplicate those conditions and make all the corrections that they made and measure at the exact point that were measured under those conditions, you will not get the same data.

You cannot look to FAA data and only on the advisory circulars and say, well, my field is quieter or noisier than this, unless you reduce the data at exactly the same point. The latest advisory circular, 36-3, is to me a classic, usable document. It gives you a darned good picture of what the airplanes will do, whether they are jets or props, at your airport if you properly convert it. But you cannot use Advisory Circular 36-3 and say the information in 36-2A is wrong. There are different measuring points, different conditions of measuring, and that is a key point to this thing. We have got to understand the measuring system.

There is sufficient data for any airport, using FAA's published data, to determine probably within a dB what any airplane will make at any field, with some few exceptions of oddball experimental airplanes which make hardly any noise or some antique airplanes which, like antique cars, do not have any requirements anyway. You have got to use that data better. Thank you.

MR. ROBERT P. MONTGOMERY: Bob Montgomery -- I am the Manager of Aviation Noise Programs for the Maryland State Aviation Administration. The State of Maryland is somewhat unique in two factors with relation to aircraft noise. Number one, while our other states own and operate airports, there are other states that own and operate an air carrier airport. The State of Maryland bought what was then an Air National Guard airport in 1972 and since that time has operated it as the Baltimore International Airport. So that we have a role not only of the normal state responsibility, but also as the airport operator with respect to one air carrier airport.

We are also the only state that I am aware of that has a legislative mandate to establish and control land use around all licensed public-use airports in the State of Maryland. The state has some 43 public-use

facilities which are licensed by the state. Primarily, they are licensed to insure that they meet the necessary state standards and so that those which are municipally owned can participate in state as well as Federal funding for airport improvement.

But in 1974, the Maryland Legislature passed what was called the Maryland Environmental Noise Impact Act. This was a comprehensive noise act and it gave to each of the departments in the state government specific responsibility for the state aviation administration. It specifically said, number one, you will set out a step-by-step procedure. First of all, you will select a measure of cumulative noise exposure which you will use to evaluate noise around airports. Having selected this measure, you will then establish criteria of permissible levels for residential and other land uses around airports.

We did this in 1975. We adopted the Ldn after considerable studies and public hearings. We established a single set of criteria for land use around airports in which we said, essentially, that new residential and institutional uses would not be permitted inside the Ldn 65 contours around an airport; of Ldn 75, basically, only airport-related uses -- mining, fishing. I do not remember if seminars fall in that category or not, but very few uses were permissible inside the Ldn 75 contours.

Then the legislation said that each airport proprietor would provide an analysis of the current and future impact of operations around that airport. In practice, that means that the airport proprietor provides us with information on actual traffic patterns, numbers of aircraft, types of aircraft, and any specific procedures, percentage of runway use, this sort of information. We then, as the state, will develop the noise contours around each of those airports.

We send these back to the local jurisdiction and they are then required to determine if there are any existing land uses which are impacted according to our regulations.

About the current and future airport operations, we only look ten years into the future. We do not try to look beyond that to 20 or 40 years. If there is an impact identified, then the airport proprietor must develop a noise abatement plan to minimize that impact. We do not say he has to eliminate it because in many cases he cannot eliminate the impact of airport operations, but he must certainly strive to minimize that impact within the limits of not affecting flight safety and it has to be an economic and technically practical sort of thing to do.

Now, the legislature gave us a number of options, not mandatory but a number of things which could be done, as examples including alteration of flight tracks, development of noise abatement takeoff and departure procedures, arrival procedures, things of that sort. Now, having gone through and developed a noise abatement plan, which we as the state agency are responsible for administering, we then go through another round of evaluation of the actual noise impact with the noise abatement plan in effect.

Any residual areas in which the noise exposure of an airport exceeds Ldn 65 are then established as an airport noise zone around the airport. The

counties then, who are the principal government units in Maryland, are given up to six months to adopt regulations, to enforce building permits, zoning permit activities within this airport noise zone. In fact, we find that we have one county that has already adopted regulations, although we have not yet put the airport noise zone into effect.

But in any case, anybody who wishes to build a structure, alter a structure, make some substantial changes, or who wishes to change a land use is required to get an airport zoning permit. If the property lies within this zone, basically under the regulations, they cannot be granted a permit unless the predicted noise exposure is less than the limit of use which is asked for. This purposely is intended to prevent the development of new or incompatible uses around the airport.

Now, there is an out to this. This is sort of an administrative level. Anybody who does not like the decision then may take their case to a board of appeals who can hear and grant the variances from these regulations to permit actual construction proceedings. There is one mandate that must be met, however. The board cannot issue a permit unless they are assured that construction proposed will provide adequate noise reduction so that the interior noise levels will be at least as low as they would be for a similar use outside of the airport noise zone.

That briefly is what our program involves. Now, we do of course develop the airport noise zone. We do have land use controls to prevent further incompatible development around airports, but I think the primary thing that we try to look at and should be involved in most of all is the actual development of airport noise abatement plans.

Now as operator of two state-owned facilities, we actually have gone further with these two airports. We have Baltimore-Washington International. We also have another general aviation facility, Glenn L. Martin Airport, which has a combination of corporate aircraft, Air National Guard, and other piston-engine aircraft as well as one barracks of the State Police, who primarily have helicopters based at that facility.

In developing our noise abatement plans, we do have a legislative mandate. As proprietor, we do develop a plan and we are the people who must adopt the plan; however, we cannot adopt a plan and make it stick unless we can get some form of agreement out of the actual airport user, so that most of our activities over the years have been related to; number one, working with the community to insure that they are aware of what we are doing and so that we are aware of what their problems are and; number two, working with the pilots, the pilots of the corporate aircraft, the State Police, the Air National Guard, and fixed-base operators to develop procedures which can be used to minimize the actual impact of operations.

Now, at the Martin Airport, we have developed and have put in flight tracks for departing aircraft under visual flight rule conditions. We have a control tower at Martin but it is not an FAA control tower. It is a private contractor who operates it, so working with him and working with the National Guard and others we have developed flight tracks which were acceptable and minimized, we believe, the noise of departing aircraft on surrounding schools and residences.

We found it necessary, however, considering the number of corporate aircraft we have there, to deal with the Federal Aviation Administration and we went through a long, drawn-out process before we finally got an agreement with the FAA on the local control tower at BWI on instrument flight rule departures which are basically handed off to the BWI control tower shortly after they get off the ground.

It took us well over a year before we had any agreement on instrument flight departures. Those have been in place for about eight or nine months now and seem to be working.

The only thing I really can say at this point is that while we have a mandated responsibility to develop and adopt abatement plans, and we recognize that the FAA has a certain amount of interest in it, in those things that make up the noise abatement plan, we have found in general that we can arrive through discussion at a reasonable noise abatement plan. It may not be everything that we want initially. We work and it is a continuing sort of process, but you have always operated under the theory that when we started this program, that since we have a legislative mandate to do something like this we abhor a vacuum and if other agencies will not step in and adopt or take action to provide the maximum noise abatement within our understanding of our responsibilities, we will take that action.

MR. CHARLES BLAIR: My name is Charles Blair and I am in the Airports Division of FAA, Southern Region of Atlanta, Georgia. I regret that I was not here yesterday when Mr. Wesler spoke, because I am sure that he referred several times to the Department of Transportation's continuing Noise Abatement Policy, dated November 18, 1976. This document, which is more or less our Bible, for the first time very clearly, concisely defines what our role is and what the local government's role is and we have used it quite a bit.

So, I am going to read from it for about three or four minutes on the authorities and responsibilities under the policy. The Federal Government has the authority and responsibility to control aircraft noise by the regulation of source emissions, by flight operational procedures, and by management of the air traffic control system and air space in ways that minimize noise impact on residential areas, consistent with the highest standards of safety.

The Federal Government also provides financial and technical assistance to airport proprietors for noise reduction planning and abatement activities and, working with the private sector, conducts continuing research into noise abatement technology.

Airport owners are primarily responsible for planning and implementing actions designed to reduce the effect of noise on residents of the surrounding area. Such actions include optimal site location, improvements in airport design, noise abatement ground procedures, land acquisition, and restrictions on airport use. And we tend to quiver when we hear that comment. The airport owner must weigh the costs of alternative means of achieving noise compatibility against any economic penalties that may result from the decision to limit the use of the airport through curfews or other restrictions.

The powers of the proprietor to control what types of aircraft use his airport, to impose curfews or other use restrictions, and subject to Federal Aviation Administration approval, to regulate runway use and flight paths, are not limited. Its actions are subject to two important restrictions. It may not take any action that imposes an undue burden on interstate or foreign commerce and may not unjustly discriminate with regard to any airport users.

We hope that after a few of the court cases are settled -- and the Santa Monica is one of them -- we will know how to more realistically interpret what use restrictions do interfere with interstate commerce. We do not at the present time have any clear, concise definitive answers to that and very probably will not until several of these court cases are resolved.

The FAA has long encouraged planning to assure not only that airports will be adequate to provide the service required in the future, but that prospective noise impacts are evaluated and minimized. The FAA policy has been implemented through four principal methods involving the Airport Development Aid Program.

First, under Section 16 of the Airport and Airway Development Act, the Secretary may approve a project only if he is satisfied that it is reasonably consistent with the plans of planning agencies for the development of the area in which the airport is located. A project may not be approved unless fair consideration has been given to the interest of communities in or near where the projects may be located.

The Act further declares, as national policy, that the projects involving airport location, runway location or a major runway extension shall provide for the protection and enhancement of the natural resources and the quality of environment of the Nation.

In essence, what we mean is these types of projects fall within the provisions of 102cc of the National Environmental Policy Act. It also provides that when a major runway extension will have adverse environmental effect, it may not be approved unless no feasible and prudent alternatives exist, and that all possible steps have been taken to minimize such adverse effects.

In addition, Section 18.4 of the Act provides that among the conditions precedent to project approval are: appropriate action, including the adoption of the zoning laws, has been or will be taken to the extent reasonable to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. These are the conditions of certification that the airport proprietor give us when a grant of agreement is executed.

While the FAA does not and, in our judgment, should not have the power to control land use around airport throughout the United States, the grant of Federal funds for airport development has been and will continue to be conditioned on the application of the foregoing principles.

Secondly, FAA has awarded ASAP funds for the development of airport master plans. These plans contain an environmental analysis and planning assessment to assure that the airport's noise impact is held to a minimum. I was reading this morning while waiting for this -- Dr. Bragdon completed a study and we assisted him somewhat, and it involves a view of master plans in the land use data book, and discovered that about 50 percent of the master plans did not really get into the off-airports land use planning situation.

Third, the recent Airport and Airway Development Act Amendments of 1976 authorize for the first time the use of Federal airport development funds on projects used to achieve noise relief. Specifically, section II of the Act now authorizes Federal financing of land acquisition to insure compatibility with airport noise levels and the acquisition of noise suppression equipment. We are also seeking an amendment of that Act which would authorize the use of ADAP funds for the purpose of noise monitoring equipment.

Fourth, and as a result of the ADAP Noise Policy, FAA initiated a pilot project to encourage the preparation of comprehensive noise abatement plans by airport proprietors. These planning studies were called ANCLUC, Airport Noise Control and Land Use Compatibility studies.

At the present time we have studies under way at Fort Lauderdale, Orlando, Cincinnati, Atlanta, and Birmingham. Thank you.

MR. MAURICE E. GOSNELL: My name is Maurice Gosnell. I am a lawyer from Lawrenceville, Illinois, and I am not the President of the Pilot Lawyers Bar Association right now. I am the immediate Past-President. However, I spent four years in that office and hopefully learned a little bit about it and to some extent a bit about some of the problems that we are discussing here today.

I presume I must be here as a member of the private sector because I am about as private a sector as you can get in the aviation field. I fly my own airplane around. I flew in here this morning and I did not have a bit of trouble with the PVA down here. Many people complain about it but all I have is a private license with an instrument rating.

I have done quite a bit of flying around the country and I really approach this subject first as a pilot, because it does seem to me that we must be looking into the future to some extent here when we worry about general aviation and the noise abatement procedures and policies that are now being considered. The reason I say that is because I have made a little study about the noise produced by general aviation and I can assure you that there is no way that with my Beechcraft Traveler, I could even approach these noise levels that are concerning the people who are working on the problem.

I have been told by people who claim to know, at any rate, that about the only general aviation aircraft that would violate the regulations that are presently in existence would be perhaps a Gruman-2 -- that is a big jet -- or the Lear. Apparently, the Learjets are pretty noisy. When you get down below that, as the representatives from GAMA here said a while ago, you have the Citations which are pretty quiet. Most of the other general aircraft jets are pretty quiet. In fact, I have also been told that even the commercial carriers, airline jets, are getting quieter.

The 707's, for instance, I have been told were the noisiest and now the 747's, unless I have been misinformed, are quieter than the old 707's. So we must be talking about the future so far as noise control for general aviation is concerned.

Day before yesterday, I was at West Palm Beach International and I visited a bit with my friend, Kim Tilford, who operates Tilford Aviation -- and he is still the head man around the place even through I think that it has been taken over by a larger operation. He was giving a TV program and he was being interviewed on Channel 12 there at Palm Beach about the master plan that is being developed for Palm Beach International, and which apparently is a result of some of the things that are being discussed here today.

One of the things that interested me was that general aviation operations at Palm Beach International this year, I believe I was told, amounted to 150,000, and the master plan is considering 800,000 operations by 1985.

Now, that just does not to me seem to be realistic.

I might say that Kim felt the same way. Of course, no one is objecting to a master plan. In fact, it is a good idea but what I am suggesting is that we maybe get a little ahead of the story when we talk about controlling general aviation at Palm Beach International to cope with the noise situation.

The other aspect of my appearance here is connected to the fact that I am a lawyer and, as such, I am absolutely mystified at the disorganized condition that I find the noise abatement efforts to be in. For instance, in the State of Illinois a great friend of mine, Bill Scott, who is the Attorney General, has been accused of tilting at windmills. He right now is tilting, or was recently, last time I read it, tilting at, of all places, Pawaukee and DePage County.

Now, they do have quite a few jets based at Pawaukee, and I don't think there are any out of DePage County, but he, as I understood the situation, filed some kind of complaint with the EPA. Now, I am not exactly certain what the nature of the charge was and there really has not been any trial or any hearings, other than just some sort of preliminary skirmishing to find out who was going to do what. Of course we have got O'Hare right next door to Pawaukee in DePage County where the noise, according to the people who live there, is so tremendous they cannot even keep pictures on the wall, but that is not from general aviation aircraft. That is from the airlines, of course.

Now another little tidbit of information that I got there at Palm Beach was that -- well, this will give you some idea of why I think that the whole situation is disorganized. I learned of a suburb of Palm Beach that just extends right off runway 9-left. That is their main runway. Nine-left has an ordinance that restricts flying over that suburb to 1,000 feet. Well, suppose I was City Attorney of that suburb. Would I file charges against all those aircraft that take off there on 9-left and do not get to 1,000 feet before they get over this suburb which adjoins the end of the runway? In

fact, I was told it comes right up to the approach lights for the back course localizer approach to the B27-right, so that could be done.

The City Attorney of that suburb could have filed a charge against me this morning when I took off there because I sure did not get above 1,000 feet. And I suppose he could have said that as quiet as my bird is, at that low altitude it might have come up to some of the restrictions that we are talking about. Fortunately, he doesn't do that. It appears to me that some of the problems they are facing came about because once a developer learned that an airport was going to be established at a certain place, the developer then immediately went to whatever zoning or other regulatory authorities who had charge and control of that particular area outside of the airport boundaries and got variances from them so that he could build subdivisions, which at that point seemed to be a very attractive situation.

Of course, later on the people then began to become a little bit unhappy with the city when the noise got like it does around the major airports, and that is where we get the complaints.

To solve that problem is going to be one area that I presume all of the people interested in aviation must look to, because that is in the past; that is something that can't be done, can't be improved -- other than, as the gentleman said, by moving all those people out from under, like La Guardia's approaches, and we know that is impossible. So that is one area of effort that really needs immediate attention and, so far as I can see, probably is going to require the best efforts of everyone in general aviation and all other branches of aviation.

Now, to give you a little example of another type of situation which I think is probably where the best work can be done, our little airport at home is one of about four airports that has been singled out by Flying Tiger Airlines as a possible base for their big U.S. operations. At this point, as soon as that information came out, then everyone began getting all sorts of suggestions.

At the time when this first started, I was a member of the authority that operated the airport and I can tell you what was done there, and I think it probably would work, at least so far as other airports are concerned in the future where there is apt to be a large-scale development.

At that point, the Flying Tiger Airlines being realistic about the whole situation, know that they could not come in there -- if they did decide to -- and have housing developments and other types of people congregating under their approaches and departure lanes.

Then, one of the requirements that they laid down for even considering our airport was that there had to be a zoning ordinance developed for the county. The county board had to adopt a zoning ordinance which not only zoned the areas, so far as the airport operation is concerned, but also zoned the areas surrounding the airport so that developers could not slip in and build something that would be profitable momentarily for them and then be an embarrassment to everybody later on.

And the Bay State Authority also did institute an effort to get an airport development plan which would utilize the space there to the best advantage for everyone and would prevent many of the problems that we are talking about here and now and the situations where the problems do exist.

As soon as the movement was put under way to adopt a zoning ordinance for the county and to restrict the use of land -- you see, it had to be in the entire county, could not just be there where the airport was -- you really find out who is interested in the zoning and who is not.

Those people who live in the approach and departure lanes, naturally, are the people who were interested in the noise control, and they made themselves pretty vocal. Everyone knew about their problems. It also developed that there were other people who thought maybe they could make a buck by getting involved somewhat with the airport operation. They were the people who wanted to prove it by the traffic there at the airport. They are not so interested in the zoning, in the regulations that we are talking about.

And then the last group that we found was a little bit unhappy with zoning was the industry that already was located in the country. You see, that fact that maybe an oil refinery would be seven or eight miles away from the airport did not seem to the refining company to be a reason to impose regulations on it, just because they happened to be in the same county as the proposed base for Flying Tiger.

Of course, Flying Tiger might not come there anyway, so here they end up with the zoning regulations which would also have to apply to all industry in the county and all of the operations that would be involved. And so the result was that we had opposition from those people. Fortunately, those are all problems that can be worked out, I think.

Now, the last comment I would like to make is that I have read enough about the Santa Monica decision to have some feelings about it too. I think everyone in this case, the lawyers and the judge, the witnesses, must have done a fine job because from what I read, evidently the judge was educated pretty thoroughly about what the problem was before his court. But I have a feeling that that decision is only going to apply to one particular airport. It would be my guess at this moment that those same lawyers who did so well in the trial of that case and, undoubtedly, will do well in the appeal, could be just as ingenious in restricting the application of that decision, when it is all over, to a situation which would be peculiar there to Santa Monica.

So actually, I came here today to learn. I am listening with great interest to see how these gentlemen who are involved with the subject of noise abatement and the other controls, to see how they suggest that they be handled. Thank you.

MR. FRED GAMMON: My name is Fred Gammon. I am the Airport Manager at Teterboro Airport in New Jersey. You have learned a little bit about Teterboro Airport from Mr. Goodfriend this morning when he described some of our procedures. I do work for Pan Am. Pan Am does operate Teterboro Airport but they have me as a general aviation airport manager only. I do not feel there is any conflict.

I will just briefly go through what I feel an airport operator's obligation is. I am a staunch believer in self help and if you can avoid regulation where possible, you are much better off because by avoiding the regulations, you also avoid some of the controls that can eventually hurt everyone.

And I think that not just as a description of that -- It is like the case, in a sense, in Santa Monica; that too no one really wanted it. I think that is a case that certainly is true in the control of airport noise too, that no one actually or not everyone will win. You cannot control airport related noise and expect the airport, the aircraft operator to altogether win; nor, on the other side, the community. What you have to do is strike an even balance, because as an airport operator, my responsibility is to two distinct groups; that is, the airport user and the community that the airport is in.

We have nine different communities that I have to deal with at Teterboro. We are in a very heavily populated area in Bergen County, New Jersey. We are about twelve miles from midtown Manhattan, and we are the, what I like to claim, New York area reliever airport. We run about 290,000 operations a year, of which between 10 to 15 percent are corporate jets. Of these total operations, we estimate -- I have no real background statistics to prove it -- but we estimate of the numbers we have, about 70 percent of the total traffic is transient.

We have another peculiar problem though, we must use preferential runways. We use noise abatement departure procedures, primarily adopted from the NBAA procedures. We have turnout procedures from certain runways and, by the way, we have been in this business of abatement at the Teterboro since 1970, so it is not a new thing with us.

We have a confirmed noise complaint procedure and followup procedure. We have a monitoring procedure that we use primarily to check and confirm our program and our existing procedures. If there were any program that I would adopt today as a self-help program, I would go to the EPA's suggestions as to how to -- a derivative of that, perhaps, but at least something along that line -- evaluate an existing airport's situation in its community.

On the other side, we have established a very definite communication with the pilots. We hand out information sheets to the pilots, every new jet that arrives at the airport, and we have a control of those numbers so that we know when it is a new jet. We hand out an information package and the pilot has to read it on the spot and sign that he understands the noise abatement procedure; in that way, when we may approach him later on he cannot claim that he did not understand, that his company did not understand the procedures that we have laid out.

We have a group of signs on the airport that indicate the various procedures. We publish them. I have operations meetings with the tenants and the aircraft operators at least every two months, usually every month, to discuss noise abatement and changes in procedures.

We also have a community information program. We have airport PR programs which I think also is important. A community has to understand the

airport. I do not know how many noise complainers that I have invited down to the airport and I have taken them on a tour of the airport, shown them the inside of an airplane. I have explained the ILS system to them and how the instruments work in the aircraft, and you would be surprised at the type of response that you would get. I hear comments like: I really didn't understand it; you know, it really was never clear to me; I always felt that there was a brick wall between, or a very noisy wall between the airport and my home and now that I better understand the airport I can better understand your situation and mine as being ours.

So there is a mutual understanding, a mutual respect that has to be obtained, and this can only be done by communication. Again, I think people have mentioned that on several occasions here and I really cannot -- It is really one of the most important aspects of any program.

Certainly, better airport planning, evaluation, master plans have to include impact of noise. I think Pete mentioned a while ago the possible impact of a parallel runway to reduce noise. Certainly, at Teterboro, that would help me because I have a tremendous mix of general aviation traffic. I have G-2's in the same pattern with Cessna 150's. That is a mix of those very unsophisticated student pilots; in the sense that they are learning and they are in the same pattern and it creates a lot of situations.

It creates go-arounds which are very noisy -- G-2's following the 150's and they have all the flaps hanging out and have got all the power on. So, I think there are certain areas of airport planning that can affect the surrounding noise and the impact.

Zoning and land use regulations certainly are needed, although at this point I do not know how it would work in places like Teterboro, where we lie, really, as I say, on three communities, as in Westchester they have three communities. They have another state to contend with. Certainly, down in Trenton, New Jersey it is the same situation. They really practically lie on the state line between New Jersey and Pennsylvania.

I think that the Maryland plan certainly sounds logical. I don't know that much about it. I think there are other states that have similar plans, but it seems as though the approaches are good, at least from my standpoint; although I would tend to, I think, disagree a little bit with Stan in that a uniform noise standard or regulation for airports can almost be analogous to his size thirty-four suit, with airplanes -- every airport is different.

It has to be tailored to the airport's situation. You have different terrains. You have different types of aircraft using that airport. You have communities that are different locations from the runway and the impacted area.

As I recall, in one situation that was described before, the best rate of climb may work because of the community's location -- and let's face it, we are talking about the impact that the airport has on the nearest community. That is what we are concerned about. So if there is not a community there and there is not a noise impact on an individual in that location, then perhaps our abatement procedures would not work in that situation. Certainly, if you have a reduced power climb -- and I have had

this described to me a couple of times -- in instances where airports have instituted noise abatement procedures, where they have reduced the power at takeoff, by the time they get over the community they are ready to add full power back in to go to their standard climbout, and that defeats the purpose. So certainly, the best rate of climb may work in another.

DR. BRAGDON: I would like to lead off with one question and then open it totally up.

It seems from all of the standpoints of people here that there has been a concern about ability in the sense that when something is planned it should be insured that it is implemented. I would like my question to go to both Charlie as well as Bob on this. First, to Charlie -- On the question of land use assurance, the provisions indicate that the community's assurance to the FAA that they are doing land use planning and zoning is a mechanism, but my concern there is what does the FAA do about it? Is there followup to insure that there is planning continuity? And if the planning ceases after the ADAP award is given, what type of responsibility is there by the FAA, or is this sort of a one point in time shot? My concern is, is there any continuity that the FAA monitors beyond the point of the actual ADAP award, relative to effective land use planning in the future?

MR. BLAIR: Section 1884 is not new. It has been with us, even if we did not pay a lot of attention to it in years past, I am afraid. Response was very casual, a very casual type of assurance and we give it a very casual type of review and I will accept the criticism that we probably never formed much of a followup. That has changed quite a bit, primarily I guess because of the National Environmental Policy Act, and primarily because of the position we have taken in the Southern Region.

We performed an evaluation not long ago and we did discover that in many cases the responses gave us assurances that were not adequate. They did not identify the measures they were going to take or a schedule and we had not established followup procedures.

One of the problems with the assurances, if you read it closely, are the words, "Reasonable to the extent possible." There is no clear definition of what reasonable effort is, so that is a decision we have to make ourselves. We do require now that they give us an assurance, an idea of what they consider reasonable. If they do not have zoning, we require that they identify a schedule, how they will go about implementing the zoning, the time period schedule, and when they expect to adopt certain zoning ordinances.

Now, when you talk about land use planning and the formation of ordinances, and the actual adoption and implementation, it can be quite time consuming and in most cases, probably 90 percent or more, that process takes longer than the life of one individual grant. So what we do is obtain realistic assurances from the sponsor and follow up on subsequent grant agreements.

I do not know that we have ever refused a grant to a major airport because of inadequate assurances. I anticipate that some time in the future we may be forced to make such a decision, and I think that we will probably either delay some of the projects or refuse to issue a grant simply because of

inadequate assurances. I guess what I have said is, we are doing a much better job within the Federal Government of getting reasonable and realistic assurances.

DR. BRAGDON: Okay. Relating that to Bob's experience, I would also like to have a state planning process in terms of looking at land use. Bob, have you seen a high degree of compliance with this or have you seen opposition or are there loopholes in terms of not how people try to beat the box but try to beat the land game?

MR. MONTGOMERY: Somebody, I believe it was yesterday, pointed out that local communities have very jealously guarded their ability to control land use and zoning. That is true in Maryland as well as in most other states, and so when we develop our regulations, we did not say that this would preempt the zoning. Local communities can zone the land any way they want to; however, they are going to have to eventually use it in a manner which is compatible with the airport. We have a very good degree of cooperation with the counties where this process has been underway so far, but it is a very time-consuming process.

For example, the county that BWI is located in has about five different zoning restrictions, and they go through a comprehensive rezoning of each district, sequentially. We were very fortunate in that the one district which comprised most of the area west of the airport was in the process of being rezoned at the time we were developing the airport noise law, so in general they are adopting zoning which is compatible with the limits for exposure.

Now there are other areas where they have not gone through this rezoning so far and, in fact, there are significant business communities who are reluctant to adopt more stringent requirements than the state requires. Most of these facilities are owned by local governments so that is a powerful incentive.

DR. BRAGDON: If Gordon Miller is here -- Gordon is going to be speaking tomorrow, but he is responsible for the State of California Aviation Program, which has a land use element process. It would probably be very useful to have his experience and how successful the land use element is, which is part of the planning requirement for the state.

MR. GORDON A. MILLER: Ours has not been too successful, I will start off saying that. Let me explain. It is a little different than Maryland's. We have a strong tradition of local government in California and the counties do have land use controls outside the incorporated areas in the counties.

In the incorporated areas, of course, the cities control it. We have several airports there in the state, particularly in the metropolitan areas, where the noise impact of the airport extends over several political jurisdictions, maybe over several cities and including at least one county and in some cases more than one county.

Recognizing it was very difficult to deal with airport noise, where you had these multi jurisdictions -- and that had been talked about here quite a bit -- the Legislature adopted legislation that required an airport land use

commission in each city and in each county having an airport serving scheduled air carrier service, requiring about, I guess, a dozen counties to have them right away.

The law has been extended now so that all counties must have such an airport land use commission. The land use commissions were set up to do land use planning in the vicinity of airports, with the idea of identifying the area that should have development compatible with the operation of the airport. Unfortunately, a couple of things were missing. One is that there is no requirement, no date when these land use plans had to be finished or adopted. So that in some counties, in a few counties I guess would be a better way to put it, we do have airport land use commissions but in most of the counties we do not.

Part of it is because of just a general lack of interest in the counties to go ahead and do something like that, and the other is a lack of funds. The legislation provided no source of funds to do the planning.

The land use commissions were envisioned to be made up of specific kinds of people, people representing the county, county government, government of the cities in the county, airport management, and some members representing the general public. But the law allowed an escape clause, by saying that any planning body with duties for doing land use planning could be relegated to be the land use planning commission.

Where that has been done, of course, it is just an extra duty for the county planning commission and/or the city planning commission. So that it is just the same people looking at the same problem without any particular additional requirements to consider land use planning around airports.

The other thing that has made it fairly weak is that in the final analysis, local government can overrule the airport land use commission plans. By a fourth-fifths vote, the county ruling body -- the board of supervisors or the city council, if it is city land that is impacted -- can just fault or overrule what the airport planning commission has done.

Of course, it puts a little heat on a city council or a board of supervisors to vote four-fifths to override a plan that has been carefully done. And the effort has not been totally wasted, but there are only, I would say, probably a half dozen counties in the 58 counties in California where it has really been effective. We are trying to find some other way to beef it up.

The state has provided funds for a couple of technicians, a couple of land use planners in one of our metropolitan counties, San Bernardino County, to actually work with the county planning group to do the technical work, and that was taking place in some county which could have done it for itself.

But in the final analysis, we run into the problem which has been mentioned quite a bit here today, and that is the fact that when you come right down to it. Political decisions have to be made if you are going to have a plan that is going to have any chance of being implemented. The technicians can do all the work they want, come up with a wonderful plan, but it has to be adopted politically.

So, I cannot report that we have had great success. I think it has been educational. I think that just having this law on the books, having a commission in business and getting some publicity has assisted some places, and we are further ahead overall now in California than we would have been without it. But we really have not done the job we had in mind when we first got the law.

MR. LEWIS: First thing I would like to say -- Herman, I know you are a member of N.O.I.S.E. In fact, my wife is on the board of directors and we are proud to be a part of that organization. Now I have some comments and questions for Stan Green.

I agree with you. Europe is at least ten years or more ahead of us in airport noise abatement practices and things. We did a study about a year and a half ago and we contacted 252 airports throughout the world. We had a return response of about 45 percent and it clearly showed that Europe and even Africa were way ahead of the United States in airport noise abatement practices.

There was one statement that you made though, Stan, that I think I paid great attention to, and that is we cannot cater to the idiosyncracies of a few neighbors who feel their cars and lawnmowers can make more noise than airplanes. These people who object to the noise of airplanes are not some nuts off the wall. First of all, airplanes are going 24-hours a day, seven days a week; lawnmowers are not; cars are not going, normally, unless maybe you are near a highway or something. You are talking about people who live in residential communities. So when statements like that are made, I think they hurt the cause of noise abatement.

Next, in talking about fuel economy possibly taking a front seat over noise abatement, if the manufacturers of your commercial airplanes can come out with new airplanes that are more fuel efficient and quieter, why cannot the manufacturers of the Cessna and other of general aviation do the same thing? It would seem to me that would be an easier job to do it on a small airplane than a big airplane.

MR. GREEN: I want to answer some of these. You just threw a bunch of questions at me.

All right. Let me actually clarify rather than give an opposing view to both issues that you have raised. The point of hurting our cause by complaining, in a sense, that to the complainers is a valid one and I do not intend and I hope I did not convey the view that anybody who complains about aircraft noise is a kook or a nut or a little old lady in Tennessee, as the old cliché went. But there are very valid problems of noise at airports and there are very valid complaints, but there are complaints that have to be balanced in many cases and we do not seem to be balancing.

Now, at the Santa Monica trial -- and it is in the testimony -- a very intelligent individual with whom I had some very fine conversations during the recesses -- we had plenty of those in the trial -- on the stand, was asked the simple question -- and this had to do with the jet issue and I think he destroyed a bit of the case for his side -- would you object to a jet aircraft that was 15 dB quieter than the limits you have got right now.

His answer was: I object to any jets; I don't care how quiet they are; I just don't want jets in here.

MR. LEWIS: That is right.

MR. GREEN: Now, from the validity point of view, I think noise is noise. I am not saying that the straight energy level of a jet aircraft is perceived by people the same as the equivalent energy level of a prop, but there are ways to equate them.

But to object irrationally to a jet aircraft does not help anyone. Santa Monica has now proposed to lower their noise level to 85 on the CNEL scale. The reason is a very simple one -- what they stated in the newspaper is so they can keep the jet out, irrespective of what the judge said, what he stated in the order. Of course, to keep them out of a contempt situation, what was said was we feel we need to meet the goal of 55 CNEL and ban all props or jets above 85.

Their measured CNEL, without aircraft, any aircraft, Cessnas, 152's and any others on up is approximately 62 CNEL now. If they wiped out every aircraft they would not get to this magical 55, because they have lawnmowers and they have cars at the rate of 400 an hour's average during the day, 7:00 a.m. to 4:00 p.m. -- to 11:00 p.m. by one of the measuring sites.

Now if they want to stop the car traffic and the lawnmowers and the barking dogs, I guess they can reach this level. But those are the kind of irrational efforts -- we will not compromise, we will not talk, we will do everything we think we can to get rid of the aircraft noise and to hell with the rest of it.

MR. LEWIS: That's right. I come up against them too, where they say shut the airport down, and it is a hell of a job to try to convince them this is not a viable argument and to forget about it. But the point is, when they make statements that these people are kooks, they are not going to cause any good.

MR. GREEN: All right. Let us not talk about the kooks any more. Let me answer your other question. Fuel and noise in general. The two do go together, particularly in the determinations we make. We are planning tremendous advances in the fuel reduction capability we have in the fan-jets, as have the airplanes.

I am looking right now, in a sense, at engines that are going to be on line in 1982, 1983 for a new class of aircraft, the commuter aircraft. This transportation needs a lot of larger aircraft that are being used today. We are a little behind the power curve there, with respect to deregulation. It has a tremendous effect.

But the two things that are very noticeable about the new engines that we are talking about for 1982, '83 certification, which mean they will be in aircraft about 1985, the fuel specifies number -- meaning the amount of fuel they use per unit of power -- are numbers that were undreamably low five years ago, even. They are talking of 50 percent to 75 percent actual savings

over existing new technology engines, and they are also expected to be five to eight dB quieter than the ones we are talking about today.

The new, modern, quiet turbofan engines today are going to be, in the next generation of engines, even quieter. The two go together but now you get into the balancing, and particularly in the piston engine fleet, of equating noise and fuel and we have a little problem there.

I will go into it a little bit more perhaps tomorrow, but I will cover a little bit now. What we are doing is establishing some new power limitations that will be instituted, starting this year, but the main effect will come next year. This is in cooperation with the FAA but they will be established by the manufacturer and made a limitation on operation. They will knock off about four to nine dB from the legal way a person can fly an airplane -- and most pilots fly it by the book.

The problem we came up with is also the one we talked about briefly, how to optimize your fuel. The faster you get up to an altitude, generally, the less fuel you can use over a long trip. You are not going to be able to get up there as fast. And we also have the issue of climbing at VX and VY, the maximum angle versus the maximum rate. We are trying to come up with an optimization that will get the airplane the quietest along the track, no matter what way he climbs, by limiting the power but by not getting the airplane too slow in a climb situation, the engine has to reach. The extra reach means you are flying on more fuel and when you are paying as much as \$1.50 a gallon for aviation fuel and watching the prices go up, guys don't want to do that.

We can save, sure -- not a lot, eight or nine-tenths of a gallon of fuel pound of fuel on a trip but multiply that and that is the reason why we are having to spend a little extra time in the computers to figure out where the optimization is. But there is a definite trend, a very distinct link between fuel economy and less noise.

MR. LEWIS: Yes, but I think that the aviation industry as a whole, whether they are talking about general aviation or commercial airlines, has to realize that noise abatement costs and they are going to have to accept those costs because they are the ones who are causing the reason for noise abatement. And if it costs some pilot, whether he is a private pilot or an airline pilot, a couple of extra bucks for the fuel, this is the price he is going to have to pay.

MR. GREEN: How about the fact that it takes fuel out of your automobile.

MR. LEWIS: We pay the price too.

MR. GREEN: I did not say it was because of a cost thing, but if we do not have enough fuel and we decide, or the government decides that aircraft flying is more important than your driving, then you have another complaint.

MR. LEWIS: Well, I think somebody here said yesterday that aviation uses -- What is it?

MR. GREEN: We use seven-tenths of one percent of the fuel used in transportation; not all fuel, but just used in transportation -- a minuscule amount.

MR. LEWIS: Then the increase or decrease of fuel should not cause any effect on it.

MR. GREEN: I agree with you on that. The only problem is, we are forced by government regulation to give as much credence to fuel economy as we are to noise. Now, it is your government as well as mine so you have a right to complain and tell the Department of Energy that the aviation people should have all the fuel they need and we will love you for it -- and we will be quiet.

MR. LEWIS: Okay. Maurice Gosnell, you made a statement about why everybody is getting so excited about general aviation noise when there is not really a problem at this time -- at least, that is the way I read your statement. Number one, while we around Kennedy Airport do not really have a problem as far as general aviation noise is concerned, there are other people that do and I think the reason may be that the mistakes that were made in letting commercial aviation make the noise that is causing all the problems in the carrier airports now, we are trying to avoid in the general aviation airports. So the idea is to look at the problem when it is first starting up, not after it has become unmanageable.

I just want to make a statement like that and see if it fits in with what you meant.

MR. GOSNELL: Are you addressing that question to me?

MR. LEWIS: Yes.

MR. GOSNELL: I think that is a fair statement. I was willing to throw up my hands about the situation as it exists with regard to O'Hare and perhaps Kennedy and La Guardia. I do not know much about them and my recommendation was that a little more organized program be set up for those airports where there is an opportunity to undertake zoning and the regulations so that the same problems will not exist again. But I was a little discouraged to hear the gentleman from California put the finger right on the sore spot, and that is when you get right down to the bottom line in these efforts it is applying the controls.

I would like for you to go back and think about those developers who got variations to put subdivisions around O'Hare and the other airports.

MR. LEWIS: But you are basing everything on land use. What about procedures for takeoff and landing and runups and all this touch-and-go? These are the items that are part of the noise problem too. Land use is one part and, admittedly, a big part and hopefully that will be solved.

MR. GOSNELL: I have no objection to including that in the master plan also and in the county zoning ordinance and those bodies who do regulate the operation of the airport.

I am all for corridors, corridors which would be set up so as to not involve anyone who happened to be living underneath those corridors. I would prefer those and I think anybody who flies an airplane would prefer that type of recommendation rather than to have to climb slow, like our friend up there talks about, and expose the passengers in those airplanes -- whether they are general aviation or airlines.

MR. LEWIS: Expose them to what?

MR. GOSNELL: Expose them to getting killed.

MR. LEWIS: Thank you.

MS. SEARLE: I am Lucie Searle from the Massachusetts Aeronautic Commission. Stan, I took quite a few notes during your comments and I would like to respond to a few of them. First of all, I don't have any quarrel with you on the business jets. I think I mentioned yesterday that we have done some real good things there and there has been a lot of progress. Besides the Citation there are a number of other jets that do have a longer capacity, that you were talking about, that are quiet and I think the industry has to be complimented for that and should be.

It is on the props that I think you and I will maybe agree to disagree for quite a while. The fact is that the standards that we have now for props do not anywhere come near reflecting what props are already doing, and I think there are three levels to look at this.

One is the marketplace, which to me means what is going on right now. And the second is what I call available technology, and that means what we have that know-how to do. The third is what I call future technology. We are still learning and want to build a better mousetrap but haven't quite learned how.

In the marketplace right now -- I have to repeat some of the statistics that I gave you yesterday -- there are a couple of Cessna models, single engine props, in the market that do under 70 decibels at the 1,000-foot on a 1,000-foot flyover. FAA only requires them to do almost 78; in other words, they are eight decibels quieter than what the standards call for.

I think that there is a philosophical delimita here. You see it on one side and I see it on the other. The standards reflect the barest minimum of what we are capable of doing or should standards be a goal that we strive for? Now, I see them as a goal, something that we want to work to do better on. And I think perhaps you see them as reflecting the very barest minimum of what we are capable of doing. That is what we have now with FAA-FAR 36 standards for props. They do not, in my opinion, give us any reason to be innovative and give us much incentive to try to do better.

As far as available technology, what I call that second level, there are probably people here -- particularly Bill Galloway -- who can elaborate all the more on this. I know some of the homework I have done goes back to the 1940's to research in my area; Harvard and M.I.T., with Dr. Otto Koppen and Dr. Lynn Bollinger. They experimented on four-bladed props, got the rpm's

down to 1,200 and came up with a very quiet, light prop. That says to me that the technology is there.

I know you cannot wait to say some things, but let me just finish on my other point. Last summer I was in Great Britain on my vacation and toured the Downey-Roble plant, which is just outside of London. They have been working on what they call an abductive propulsor; it is a fan. Now this is suitable for retrofit. They have fitted this on a Norman Islander -- this is a conventional twin-engine prop and they claim a noise reduction value of 20 decibels.

They also claim they are not sacrificing performance. You may disagree. I saw a flight demonstration and from what I did not hear and from what I saw, it was very impressive. To me, that is part of this available technology that I am not sure we are taking advantage of.

What I call the future technology, we are not sure how to do yet but we are trying to learn, is going on now. I see one place I can cite is the M.I.T.-NASA work that is being sponsored by EPA. You mentioned that some of this work takes a while to develop and I think you mentioned some of it takes three years for the industry to turn out one of these newer model planes. My response to that would be, that is not an awful lot of time, and remember that the props are going to be with us for ages.

Probably many of you know Crocker Snow -- I work with Crocker -- and he is flying a 1946 Navion and has been flying it since 1946 and he has taken good care of it. There are thousands of people like this who still have these planes. They are in the fleet for ages.

I will just make one more point because I am sure you have a lot that you want to say. You questioned some of the EPA work, the relationship we have here with the EPA work, the relationship we have here with the EPA proposing and then the FAA disposing. I don't have all the research in front of me but from what I recall, the FAA turned down the EPA's proposal for tighter standards for light props, not on the basis of technology but simply on the basis that the EPA had not made an adequate health and welfare argument. Now, this is very different from technology. So these are the things I really want to record to show because I think they are pretty important.

MR. GREEN: Let me start at the beginning of your list and I think that was the question of whether we should have a standard as a goal or as a state of technology. The problem with the standard as a goal is it would not pass our United States concept of fair play. The law cannot require that which you cannot do and to have a law on the books that if you do not meet the goal you do not get certified.

MS. SEARLE: You are already meeting the goal with lots of your planes.

MR. GREEN: With some. Now, let me answer that aspect of it. I don't think you quarrel with us when we come in under the limits. An airplane that is required to be at 80 or 70 or whatever number dB you want to pick and then it comes in under that, is just as quiet as an airplane that we required

to be at 77 and came in at 77. It doesn't matter how we get there but there is a part of the law that is an individual aspect of the FAA mandate, in a sense, of the 1972 Noise Control Act, which says each type airplane will be as quiet as it is practicable to be. So if you have got a law that says 80 is a top limit and 68 is the bottom limit and there is a weight basis in there, and you are capable of building an airplane that will come in at 50 dB and serve a useful commercial purpose as far as you are concerned, you are in fact obligated to do so. And that is the reason why we are under the limits in many cases.

Now, I have seen some of the work that was done on the quiet airplanes in the 1950's. I was privileged some years ago to stand some 300 feet under an airplane and when it went overhead you barely heard it. It was a Lockheed Q-fan. It was extremely quiet but it was with that airplane, just as it was with the designs that were done at M.I.T. some years ago, that it was just not practical economically and simply because of the 300-mile range, no payload; they are not economical airplanes.

MS. SEARLE: We have all talked about the problems of touch-and-go, which are training operations. Now, wouldn't that be an attractive trainer?

MR. GREEN: A \$300,000 trainer would not be a trainer. No one could afford it, aside from the fact that they are extremely complicated airplanes to fly and you would need a good, highly qualified pilot at that. They are not easy airplanes to fly. You swing in a big hunk of props, as slow as they were, you have got a torque problem. I wouldn't want to be within throwing distance of the metal that is going to be landing down the runway.

Now granted, we defend the commercial need theoretically but it is done as a result of what we feel the customers want in the way of airplanes, what they need in the way of transportation vehicles, and maybe we have made them right or maybe we have gone wrong occasionally but, generally speaking, we meet the public needs.

The point is that for one airplane to use a geared propeller or a slow turning, short propeller that comes into a low noise may work fine, and I am then faced with developing a different engine for another aircraft to meet the same basic noise requirements and I find that I am economically unable to do so.

The development of new engines is extremely expensive. It takes four to five years to put a piston engine on the market when the determination has been made to fill that need. It takes ten years to bring a turbine engine on the line.

Now if we saw the market for those kinds of airplanes, because noise is a factor in selling airplanes -- and I kid you not that Cessna and Piper are in a war in the training issue and Beech is getting into that thing -- and one of the things they anticipate is how quiet their airplanes are because a noisy airplane is going to mean it is not going to get bought as a training airplane in places where training is normally required.

These people would buy those engines if they were available but there is not a big enough market to justify it and they do not get built. I know turbine engines are available. We cannot seem to get one at a price we can fit into a typical light training plane, I mean because of the price and weight. Yet, if I had a good, light turbine engine, swing in a prop at 1,700 rpm, we would come in very, very low on noise.

Now you do have one. You have got the Dash-7 which is a big, four-engine 50-passenger transport. That is an extremely low noise vehicle. That same engine -- granted, it is a 1,200 horsepower engine which is roughly three times larger than any of the pistons we use -- if we can get one small enough, turn the prop at a reasonable speed such as that one is, we could get the noise down, but you no longer have a \$50,000 airplane because your engine is \$250,000 to start with.

So the technology is there but not at a dollar cost that anybody can even conceive. To give you a very specific example, and this was, I think, the reason why FAA turned EPA down. We provided a tremendous amount of economic data based on studies -- I am sure Ed Hooper can elaborate on them better than I can -- on what it would cost to meet the requirements proposed by EPA in lieu of those required by FAA as far as propeller-driven aircraft. Those standards in effect were wiped out in the sense that engines were not available. They would have to be developed from scratch and this is a four or five-year lead time and there was no money to do it.

We are talking about a simple piston engine program in the order of three million dollars to develop an engine from an existing model. When you get into the small jets you are talking in the neighborhood of close to eighty to a hundred million dollars. There has got to be a pretty good sized market out there to demand something like that.

We are looking at a new generation of engines. They are turboprops and several companies are involved, big names -- Pratt-Whitney, G.E., Garrett Aviation Company. They are looking at a reasonable sized market for this class of aircraft but they started the engine development years ago. We won't have them except in prototype until 1985 and it is a long, long process.

MR. JOHN SCETTINO: Before I asked the question though, for the people in the audience who might not be familiar with the language of Section 7 of the Noise Control Act, there is some unique language pertaining to the issuance of new type certificates for aircraft for which no noise requirements have been established.

Now, we at the EPA were aware of the General Council's interpretation of that language and how it was getting applied by the FAA, because we encountered a situation where new-type certificates were being awarded for helicopters for which there were no regulations and still are no regulations.

And we were under the understanding that the FAA was making determinations against each specific application for a new type certificate and it was a written determination in which they would say this airplane A, X, G, B, does in fact incorporate all of the available technology and therefore it could not be made any quieter through the existence of a Federal regulation.

So that was the satisfaction; that is it satisfied legal requirements under the Noise Control Act Section 7. Now I will get to your timely comment.

I infer from your comment, which I am led to believe is a current inference by Bill Galloway's statement, that in fact if a type certificate has been applied for, for a small propeller-driven aircraft, that notwithstanding the level, the maximum level permitted under the FAA's regulations for small props, that if the particular region has made a determination that available technology could be incorporated in the airplane for which the type certificate was made, you would lower the levels and the FAA could in fact require that technology to be incorporated and that is why we have airplanes that are so much quieter than those permitted by the FAA regulation.

My question now: Is that in fact a correct inference by me concerning your comment?

MR. GREEN: Yes. That is what is going on. But frankly it had been aided by the marketplace. The marketplace demands quieter airplanes today and perhaps we maybe read the marketplace wrong, but noise we know is an impediment to sales and we know each of the companies -- and there are a couple of them represented here, a couple of companies here I think can pretty well tell you they look at noise and they try to beat those regulations by a fair margin.

Now, there is another reason of course why in many cases we want to beat the regulations, and that is to allow for growth. As they grow in size, of course, the engine grows in thrust. We need some margin for that. But particularly, when you get into airplanes that we know are not really going to change, where growth is not an issue, the point is, it is good business to get it down as low as you can, plus we have the regulatory or the statutory, in fact, obligation,

Sometimes -- and I want to point this out -- I still think it is rather humorous. I don't think anybody here is from FAA's Noise Certification Office now, but for a long time they required basic evaluation of every glider that was built to make sure it doesn't get any noisier than it was.

MR. SCHETTINO: Okay. There is a difference, and I don't really think that is any cause for humor, the law. And incidentally, you made some earlier comments concerning the EPA and how it was administering the law. I think therefore, for the record I would say that EPA does not write the laws of this land. We did not write the Noise Control Act. The Congress wrote the Noise Control Act and they mandated us to do certain things under that Act.

And I think that if you, as a manufacturers' representative or manufacturers' association representative, feels like the law is not working properly or needs modification, then I think that should be made known to the Congress. We interpret the law and we try to carry out those mandates, because as public officials we now can as a matter of fact be dragged into courts and sued for not implementing the law of the land -- let me get back to this comment.

The law says that the FAA cannot in fact issue a certificate, a new type certificate unless a noise regulation exists for it, and since noise regulations do not exist for dirigibles and gliders and frisbees -- Is that the correct term? Frisbees? You can tell how old I am already -- then in fact the FAA has to make a determination that the best available technology has been incorporated. That is the law of the land the the FAA has to administer that law just like we do ours.

But I want to make sure that the question and inference that I drew from your comment is clearly understood because in effect, what you are saying is that the FAA had determined that when in fact technology is available which would make it possible for the manufacturers to certify a noise level lower than what is required by the Noise Control Act, and that they in fact are the certified noise levels.

I think that is terribly important because I have not been aware of that and I don't know who else has been aware of it on this floor. I just assumed that all that the manufacturer had to do, like he does with any other noise regulation, is show compliance with the maximum noise level specified by the regulation. But apparently the General Council of FAA has made a further determination as a result of Section 7 of the Noise Control Act that in fact the FAA can require airplanes to demonstrate that they are capable of lower noise levels. I think that is terribly important, because I think you should be commended for that, Stan. And I think that all these people should be aware of that.

MR. GREEN: I think it did shock a number of people. We got letters. I say we, individual companies got letters asking have you met the best noise technology available. Now, it was a qualified quote available unquote, because it does get into the economic reasonableness and technological practicalities.

In one case of an airplane that I am aware of -- it was a light twin -- the company had to go through their analysis where they were balancing two different engines. They chose the straight shaft engine which their analysis showed that because of economics were available, and the weight of the airplane -- the other engine weighed about 60 pounds more, which they couldn't take, both were approximately the same horsepower in the sense the gear engine was a higher horsepower but they could have derated it.

They showed why they chose that other engine. They went through an analysis of why they picked the particular length prop and, frankly, that prop cost them a little bit in the sense of performance of the airplane, but they felt it was not critical and the difference as far as they were concerned was 3 dB. The airplane came in 7 dB and gained a little performance, but they felt the 3 dB was worth more than performance and they made an analysis, passed it on to the FAA and they accepted it. This goes on all the time. Sometimes it does not get as formally recited as I just did right now.

And the FAA guys are sitting there with the company, going through a debate in a sense of why this versus that, but these are all economic as well as legal factors within the company. Right now, performance is a fine thing in the airplane and everybody likes the airplane to go fast and far and carry a lot of payload, but we do not have unlimited range there in the sense of

picking all these parameters. We have just thrown another parameter in there and that is noise and we balance it against the range of the airplane, the weight of the airplane, like we do in any other aspect of it.

Fuel consumption, of course, is another issue.

MR. SCETTINO: I will sit down. Some other questions can be asked but I wondered if the FAA representative, whether he can answer that the FAA -- I set the timer for my question and it went off some while ago -- whether the FAA is making a similar interpretation for transport category aircraft? Can we interpret the General Council's instructions to the regions to apply to all classes?

MR. GREEN: Actually, I address this to Mr. Elkins or to you, John Wesler, I don't care who. But I think there is a role that the EPA ought to be involved in more and I will try to hit it briefly.

I do not think it is accomplishing any real work, at least I haven't seen any or do not know of anybody that has really seen any or do not know of anybody that has really seen enough of this work and I went back to the levels document and all of the other reports that were issued at the time.

I am sure I do not agree with everything that was in them but I don't think anybody, including some of the people in EPA, agree with everything in them. I think we need to do some more work. I think you guys need to do some more work and I think under the authority of the Act you have got the right to do it in a broad sense, as my remarks said.

Perhaps there need to be a change in the Noise Control Act. I think I said that some way you had to get out of the regulation writing business, which I think I somewhat --

MR. CHARLES ELKINS: We hadn't boasted that one as being eminently successful.

MR. GREEN: But there is a tremendous amount of work in psychoacoustics that needs to be done. Here we are talking about level of 65 Ldn as being acceptable and one of the documents on the noise standards says -- and I have it quoted in my pitch tomorrow that 65 is a reasonable level for airport areas. That is fine and dandy. It is not bringing any credence with any of the people in some of the communities though.

Maybe in some areas we have got to have some different standards. We have got to define better what is annoying people and perhaps tailor the concept to them. I was advocating a national system, but not the same levels and the same requirements at every airport in the United States.

I believe we are going to need to give local requirements but they have to come from a national base of expertise and knowledge and there is where I think EPA ought to be developing this psychoacoustics and acoustic knowledge, so we can apply this to the local community, recognizing that, okay, never mind that they took the Federal dowry and benefited from it locally and now they let the houses move up to the boarder, which gets the airport and aviation people upset. It is there and we cannot get rid of the

people. So what can we do at that airport? We don't know enough about the total picture of aviation noise and local traffic noise and the mix of the two at any local situation that we can apply to the airport in any way that makes sense to the local population.

You know, we keep accusing or recognizing, I should say, that we are talking among ourselves here. You understand acoustics and the airplane business -- you have been in it -- and others do, but try to explain what an engine rpm and prop size does. It is a noise to a local resident. All he hears is noise. He does not care how you do it or where you do it or what you are capable of doing. We have got to reach these people.

MR. ELKINS: Let me see if I can for the record, answer a couple of your questions. First, let me start by saying that the levels document has been notoriously misinterpreted in this country. The levels document is not a regulation nor is it a standard. It satisfies the requirement of the Noise Control Act, which says the EPA shall determine and establish the levels of noise requisite to protecting the health and welfare of the nation with an adequate margin of safety. And that is what we attempted to do.

There is a big caveat, as everyone here probably knows, right at the beginning of that document that says: this is not a standard; this is not a regulation. There has been no attempt to quantify the economic impact of any of these levels. It is a recitation of what the EPA considers to be the levels of noise requisite to protecting your public health and welfare with an adequate margin of safety.

I think that the low boundary was established on the basis that that was probably the threshold level below which there were no known adverse consequences to noise environment or to noise exposure. And the upper limit was based on the meager knowledge that we had at that time on hearing impairment, for the effects of noise on hearing.

Now, you are correct that we have not attempted any way to break down what happens between Ldn 55 and Ldn 75 or greater, except that based upon the extensive work that has been done in the aviation community, for which they should be commended. Again, for the record, they had established that apparently Ldn 65 is about the threshold that you can expect organized complaints about aviation noise. That has since been confirmed with highway noise also, that you get about the same results.

There is a need, without question, to refine the data as to what occurs between Ldn 55 and Ldn 75 in terms of the public's perception with the noise environment.

I think that need, however, Stan, if I might, on the record state for you that the noise is so dominant right now that we are not really worried. I mean, I would be delighted if I could point a way to achieve an Ldn 65 around commercial carrier airports in this country. I cannot see a way within the next 20, 30 years and it may not be possible in the next 150 years, short of shutting down the major airports in this country which I can assure you that EPA is not going to recommend, at least not as long as I am responsible for aviation noise.

But I don't believe we need to worry about that because I would like to be able to say that the aviation community which includes the Federal Government, state government, manufacturers -- can at least hold out the promise to those people that are presently being exposed to levels of Ldn 75 or greater that they can look for relief through our actions because I think that is a terrible indictment upon our community to allow that to continue.

And it exists. I mean, we all know in this room that it exists. Now, when you get to this general aviation area, we do not know enough about what is the general aviation situation. That is the reason for this conference. We wanted to hear from experts, the people who are dealing with the problem on an everyday basis as to what do they do.

I mean, I would be delighted to be able to tell my boss that I think that Federal involvement is really not necessary at this point, except perhaps in an advisory role to make information available, to act as a catalyst; you bring groups like that together around the country and we may very well determine from this conference that that is in fact the best course of action for the Federal Government at this point.

So, we did not come here with any preconceived notion that there was a problem. We did start some work however; as a result of the FAA's nonprescription notification to us on our small propeller-driven rig because, as Lucie reminded us, the nonprescription notification was based upon an inadequate showing on the part of EPA that general aviation which of course the small prop rig is, what it was directed at primarily, was in fact, a problem.

MR. SCETTINO: They did not say anything beyond that. As a matter of fact, they made a commitment that they would look into that themselves and as a consequence of our being unable to determine that they had done anything like that, we have initiated at least two pieces of work that I earlier identified for you and which again I am sure you are aware of, as are others in this room.

We are taking a look out into the future to see what is the general aviation situation, just as we have done with commercial carrier aircraft. We have taken a look out into the future to see what we can expect. Now out of that study -- which incidentally was awarded to Bolt, Beranek and Newman and was a result of competitive procurement where we had a number of companies compete -- we hope to get a better handle on what these 14,000 airports are, or whatever that number is, and what can be expected in the future as those things change.

So, that is one piece of work we are doing. The second piece of work we are doing deals with the very issue that you have raised, health and welfare. And as I indicated yesterday, your science advisory group has for over a year now been involved in a study to determine what are the appropriate criteria to be used in evaluating general aviation exposures, noise exposures and I would fully expect that Elkins expects to have a public dialogue take place as we did with the levels so we can get the benefit of the experts in this country who deal with what psychoacoustics is, because we certainly are not experts.

We do not even have the tools to use to claim any expertise in that area. So we hope that answers your question in a way on the general subject of health and welfare. I think Elkins stated to you that he is getting very concerned about the health aspects of noise, because there seems to be a body of evidence developing that noise in fact may be responsible for some very serious health problems.

He is spending a considerable amount of time and budget on that subject and most of that has been the result of the Congressional mandates and the reauthorization acts pending now for the Noise Control Act.

I believe that those budgets carry several million dollars to do that kind of work. So, it will get done because the Congress has mandated that it get done and so I hope we will have some additional information on health and welfare.

DR. BRAGDON: All right. Lew has been standing here so we will let him speak.

MR. GOODFRIEND: My name is Lewis Goodfriend. I think that John has entered the accusation about EPA and its scientific basis for knowing the effects of noise on people. They are working in that area. They are getting help in that area but I think that I should say one word in defense of the scientific acoustics or psychoacoustics community.

A lot is known on the effects of noise on people. Behavior response may be something a little different and it is the same problem. If we knew the answer as to why people respond in a particular way to a noise, I think that we would also understand why people went out and bought a particular fast food chain. I don't believe it is so simple that you can look at the psychoacoustic response to noise level.

I said this morning and I am convinced from everything I have heard -- I refer to Andy Harris' papers -- that is no simple functional relationship between noise levels, frequency of occurrence, and human response. It is a very complex area. Noise is one stressor in a human experience for each individual and that individual's response is going to be governed by his entire history up until the moment that he responds.

And I don't see that even with the help that EPA is going to get, that we are going to be able to produce that answer that you appear to allude to. Now, maybe you were merely attempting to get EPA's attention but I wanted to stress the point that a great deal is known about the physiological response and psychological response to noise of various types, various levels, doing various things with various psychoabrasive units.

That to me is not the problem and not the problem EPA faces, not the problem the scientific community faces. It really boils down to a political problem. One of the things I predicted about the EPA petition to the Federal Aviation Administration, I believe if that were adequate or made into a regulation it would destroy the potential for local municipalities to properly zone and control aircraft noise or aircraft operations of any kind at airports, general aviation airports within their communities.

DR. BRAGDON: I know we are getting close to the end. Some people have to leave. I have a question I want to ask of Herman, because it came out earlier, and that is the whole question of political accountability for decisions that planners make in concern with public participation.

Some points have been made by some speakers during the dialogue about what happens when the best, quote unquote, land use plan is developed. It seems like the politician or at least the political community does not always or have very rarely or to some extent in between those two do not respond or try to make those political changes necessary to insure that he is reelected. My concern is what role do you feel this politician has, particularly in terms of long-range planning? It seems like comments yesterday were that the politician is concerned about getting elected for his next term and long-range issues are not issues on which the politician can get elected; therefore, the issue of airport planning, which is a more long-term thing, may not be that attractive.

What would be your general comments about that from a political perspective?

MR. BARNARD: Dr. Bragdon, it is clear that a lot of politicians -- maybe I am one of them -- cannot see beyond or cannot plan beyond the next election; however, I think that some politicians do go beyond their next election. I think there is some planning being done that is meaningful.

Some governments lean on their planners and their administration to lead and to carry out work on the public and may be excusing the position that you might have in saying, you know, the best information we can get from professional planners is that this is the right way to go. That will get you by the citizens' complaints -- but you cannot always get by the citizens' complaints, and the democracy we live in says that the public determines the routes the government takes and I subscribe to this and I have for the eighteen years I have been involved in this position and I intend to continue. You have just about got to do that.

In College Park's case, where it has -- But, yes; we do respond to good planning. Good planning is necessary. However, in College Park's case, I have to admit that we have not done so to any great extent because, as I mentioned, our city was planned and developed and zoned and it is not a matter of good zoning in College Park. The zoning was there before the jet aircraft was, so it is a matter now of rezoning, and you have got to tell people that. You have got to get out, get out of the way of good planning and that is just hard to do. I do confess I do not subscribe to this too much. As I said earlier, there has got to be a balance, I believe, of not only moving the people away from the noise but you have got to do some of both. You have got to move the noise away from the people some.

MR. CAMPANELLA: I will preface my remarks with the fact that we are supposed to be doing land planning, yet we are talking a lot about aircraft. But I think that is good because it puts the whole thing in perspective for those of us here to show that planning is the necessity because the aircraft can be quiet, but we are showing it cannot always be quiet and put things in perspective for us to plan the so-called airport of the future.

The propeller technology was mentioned before, that there are large props available which cause the aircraft to fly quietly, so forth. I spent four years -- I guess almost a year on and off -- studying this, both informally as a paper published, and also formally as a student for FAA. So, I feel that I have learned a lot about propeller application as it were, not design but application. It is true the larger ones can be used. They call for usually gear incorporation and this gearing costs a lot. This is the main barrier toward their being implemented; yet, if they are feasible, why are they not being applied more freely?

My conclusion in the study for the FAA, with the sense that it is within the state of the art because of economic motivations, which is just going to be slow in coming. I was pleased to hear your comments and that you have essentially applied these ideas; that is, they brought the levels down to lower levels than the nominal 80 that was required for those propeller aircraft.

The Dash-7 was mentioned as a very quiet aircraft, so there are technological ways to achieve a propeller aircraft to be extremely quiet, but they are not practical because of the cost involved. The exceptions to that rule are the exceptions that are being implemented and we should be thankful that the exceptions are being implemented.

A comment on standards and limits. There is a little bit of a word game going on here. To one person a standard is a way to do something; to another person a standard is a limit that it cannot exceed, and to a third person it may be something else. The standard may be how you measure it but the limit is the number in mind here.

As you and others pointed out, there is an absolute limit and there is a desired limit and we should never confuse the two because when a number goes into the FAA, FAR 36, that is an absolute limit. I think we ought to be aware of that fact and that actually the limit cannot be set at the desired level because you have a Mexican standoff. It will not work. It cannot be done, so we have to keep that in perspective when anyone criticizes it. Remember, these are the absolute limits for everybody to meet. Desired limits might be stated but they probably will not be stated in the standard. They will be stated somewhere else in other literature, like levels document is a good place to state the desirable levels.

On touch-and-goes it is true they are noisy. I am tickled to hear that things like the Cessna 152 and others are now much lower and therefore were more acceptable trainers because that helps both the conversation in the cockpit between the student and the instructor as well as the community. At Ohio State University, where I am associated now, they are experimenting at great lengths with synthetic trainers, which you used to call the Link Trainer, to train students even though pre-solo level of confidence, not that they finish the training there but they start it there. I myself got my instrument rating in a simulator it was an experimental program in 1966, where I took 20 hours in the simulator, 20 hours in the air and I got my instrument rating like that instead of 40 in the air.

I learned a great many things from my instructor, that is a good place to introduce procedures but you cannot really finish them because the

flight environment is different than the ground environment, but there is 50 percent reduction in operations and that is an important fact. The fuel shortage is going to add fuel to that situation there since there will be less flight per pilot training as time goes on.

My last comment is about Ldn 65, and we have said it more than once here. It is not a desired level. It is an absolute limit where anybody who builds a house in Ldn 65 is a fool. Okay? In other words, it is a limit of that type and it is supplied for the instructor's use and it is successful and I am all for it.

Finally, Ldn 55 is what I felt to be a threshold of concern. Below that there would not be any objections; above it, I guess that you --

MR. GREEN: Just a quick comment. I think I would like to make two comments actually. In the Santa Monica trial, the city's noise expert, psychoacoustics expert, repeatedly referred to the EPA standard of 55 Ldn. This is the basis for their latest effort, is to admit the EPA standards of 55 Ldn.

The second comment I have -- and this is one I wish EPA would get involved in, in the sense of doing some work. In a speech that I made about a year and a half ago to a group of engineers, I went through the following soliloquy and I will be quick about it. It rained on Saturday. Sunday morning it dawned bright and sunny and it dawned on the student pilots and instructors being filed out to the aircraft, starting their engines and taking off on a program of pattered flying. The cows and the chickens hadn't wakened yet; the trucks and the tractors and other farm machinery hadn't fired up and the impact on the local ambient noise level of about 35 was rather significant. These airplanes came in at about 50, 55 dB, but it sure as hell woke me up that day -- I was out there on the farm and it is an issue, it is a real problem.

We had reached the bottom of our technological capability with that airplane at 55 but we were an obtrusive noise and this is a very serious problem. We have talked enough about touch-and-goes here to recognize that it is the repetitiveness and the fact that it does get to you. We have got a problem. I think we have got to do some more basic research on the thing.

MR. TYLER: I just wanted to comment on Stan's comment about the EPA and their recommendations to the fact that in 1972 the Congress was very anxious to have EPA look over what the FAA was doing from the standpoint of a whole list of things which were spelled out in the law and he gave his response. And in connection with the limits proposed, they analyzed the economics the practicality and all the way down probably. If you remember, each document was about that thick and you and I both testified at the hearings on those.

Having spent about 30 years with a manufacturer I am a little bit embarrassed, Stan, at having a manufacturer sort of say, well, gee whiz, we do not want anybody else coming in and telling us we ought to lower our noise levels if they can be lowered.

Now, in addition to that -- which is sort of something that I have heard echoed here from quite a few people at this conference who reacted after your statement, your opening statement, one other factor I think was very important in the EPA recommendation and it had to do with the timing of the proposed noise regulations.

As you are well aware, when the '69 regulation was promulgated it covered aircraft certified back in 1966. It covered all the wide bodies, including the 747 which had been certified in '65 and it more or less put an umbrella over the technology which was available in '65, '66.

It did not say, look boys, sharpen up your pencils and your next generation of aircraft, try to do something better. Now, when the EPA came out with their comments and the proposed regulations, they looked at current technology which was available to be implemented immediately, technology which had been demonstrated in the research phase which could be implemented five years later, and said to the FAA: Look, take a look at the technology which is so-called future technology but has been demonstrated, we know it could be implemented. Tell the manufacturers in your next generation of aircraft to try to implement these things too. Yet, they did not do that when they brought out the regulation in '77.

I think that is a point that is very important. It is a question of what comes first, the chicken or the egg. Do you certify aircraft because they have been designed and built this way, or do you tell the manufacturers: Look, technology exists to do a little bit better; see if you can implement this. Thank you.

MORNING SESSION

October 5, 1979

9:00 o'clock, a.m.

DR. BRAGDON: Good morning. This morning we are going to change the scene to deal with some of the economic influences that many times shape decision processes about airports. We have been focusing in on a variety of other factors, much from the public sector and the regulatory responsibilities but to begin with this morning we are going to be looking at how the economic market, playing its various roles, has a lot to do with decisions around airports and what impacts they may cause, positive as well as negative.

We have a lot of very good speakers, the first of which is Richard Forbes. Mr. Forbes is a professor of real estate at Georgia State University. Professor Forbes will discuss The Role of the Real Estate Industry and the General Aviation Airport Land Use Compatibility Plan.

MR. RICHARD FORBES: Thank you, Clifford, Good morning, folks. This topic and the way the words go together made me worry a little bit about how do I define the subject, and I began to get a handle on what is general aviation airport land use compatibility planning. Then I began to try to think about what have representatives of the real estate industry really done as they have seen general aviation airports develop. And one has to conclude that probably the real estate industry has not participated in the planning function, and it is not possible to, as the American Heritage Dictionary of English Language says, to, quote, state the precise meaning of a phrase, word or term because we do not have much background to go on.

The real estate representatives in the front end of the whole business of the changing custom dynamics in the general aviation arena really leave something to be desired. The real estate industry, I think you will find if you look at and recall your own experiences, look at what representatives of the real estate industry may have done, you may have a narrow notion of what we in real estate think is an arena.

We really have not done as much as one might prefer. Certainly, the real estate industry has worked in response, and Dr. Bragdon's presentation on Wednesday I think outlined this and showed the many places, in terms of general aviation airport implementation measures, that we have seen fine representation and fine response from members of the real estate industry. They have responded basically to the public investment, to the private investments, the action at the general aviation airport. But they have responded I think too much, far too much after the fact.

When I was talking with Cliff about this conference and the kind of approach that was going to be taken, I came upon an example that sort of disturbed me of the kind of response the real estate industry is sometimes likely to make to an issue. Dr. Bragdon tried to get somebody from the National Association of Realtors, among others. He was not able to get a representative of the national representative group as the spokesperson for the real estate industry.

Now there would be many people who could speak for the real estate industry and there are many organizations that could speak for the real estate industry, and yet these national organizations do not respond, which is kind of symbolic of the problems that we may have here. We may have some of the communication problem.

So, I have an interesting task here of trying to point out ways that the industry I suppose can be induced or encouraged to get in on this front-end action and to remain in on the action of the planning. I think there are many advantages to this because the industry is not just the real estate broker. The industry is not just the agent, whether the agent be working in a private arena, as a public land acquirer, a land agent. The real estate industry includes a great many kinds of activities and a great many kinds of organizations, all sorts of wrapped up and loosely held together by what we call the real estate industry.

We talk about appraisers, we talk about bankers -- we will hear about them in a little while. We can talk about developers. We have agents and brokers who are highly creative individuals who specialize in the development of very unique kinds of products in the real estate industry and for the market generally.

We have people in the industry who can respond in a planning circumstance and can respond in a very creative way. And one of the interesting things about real estate is that we find this wide range of individuals who are, in many cases, people who enjoy playing the game for the high stakes involved. The rewards for successful enterprise in real estate are simply enormous, and this kind of spirit can be captured, I think, and put to work at the front end and through the process of planning and developing the general aviation activities around which real estate can be meaningful.

We do more than just buy and sell land. We do more than help to sell the land around the airport or to buy the expansion area for the land around the airport. We can do this in a very positive fashion as well as in the negative fashion. One of the things I am sure we have all experienced is the problem of the airport and its neighbors which has been messed up by the real estate industry, by someone who misunderstands, who does not really care, who sees an opportunity and who moves to kind of mess up some future opportunities at the airport for the airport itself.

We can respond even when not wanted, and we can be speculators. We can go in and take a few dollars and leverage it into quite a handsome reward to the derogation of general aviation activity, but that is not the only thing that can be done. We can respond in this front end and there are some fine examples of response at the planning end and the development end.

We can continue in this arena but we have got to be asked, and I am not sure how many times some of these creative individuals in the real estate industry have in fact been asked by general aviation airport operators or any of the others, proprietors of these airports.

How many times in your recollection and your experience have you found someone or have you ever asked somebody from the real estate industry,

other than the broker who might be able to bail you out of a problem, to come in at the front end to give some of these responses and creative ideas as things are being put together? Airport planning is really a sort of quiet activity, I think, as far as most people are concerned, as far as most people in real estate are concerned. They know it is there. They know that there is something about the increase in traffic in the area.

They know that traffic is going to be moved if possible from Hartsfield to some of the general aviation airports. They may suspect there is an opportunity. They may not know how to define it. They certainly do not know how to define it or to be positive and helpful if they have not been really well informed. It is very difficult sometimes to be aggressive and collect that kind of information early.

Now, the advantages have to be spelled out to the representatives of the real estate industry, probably very forcefully, but I think you will find these kinds of people and you have to pick the right kinds, obviously, and we can talk about who they are in a moment. But you have got to find these highly creative, responsible people.

Now what can they do for you? Well, if you think about some of the interesting things in the landscape of cities and suburbs in metropolitan areas, you can find a number of very important things the real estate industry representatives have done. I am sure you have all been exposed to office parks -- they were invented by the real estate industry. As a matter of fact, one interesting mention of that is that what purports to be, and I believe it to be, the very first one in the United States was built right here in Atlanta, not more than about half a dozen miles from where we are right now.

It was a creation of a real estate broker who made himself completely independent because of the success.

Industrial parks probably were invented by railroads, maybe, but that is a little hard to say for sure; they certainly have a great deal of input from the real estate industry, and real estate types and real estate developers have proceeded to develop them. We have action from the public now, obviously, but there have been many kinds of things of that sort in many places around the nation where because of this unique kind of creative juice, sometimes fouled by greed by members of the real estate industry, by an individual, developments were created of enormous value in convenience and service to this country.

We have some things going on today that you may be aware of that are equally important in terms of what can be done. You might not be particularly interested in the condominium arena. We have seen the real estate industry take the condominium away from Florida and put it around the United States. We have developed many condominium complexes of all kinds and all sorts and one would think, well, that is a nice way for that arena to go, but now what are we doing in the real estate arena? We are converting existing apartments in condominiums.

These creative real estate developers are picking up a great deal of money, shall we say, and not right in this particular arena. In some places it is quite controversial but, nevertheless, here is an industry which is responding to another kind of an opportunity.

As I worried about coming and making this presentation, one of the things that I really wanted to be concerned with was at what point and where can the real estate industry be responsive in the general aviation arena. Well, that is very hard to define because these individuals who respond to the situations that are available will respond in the circumstance that is presented at the time. And the thing that needs to be done by the general aviation industry and the airport operators, pilots and manufacturers, is to give members of the real estate industry the opportunity, and these people are the creative ones, the developers, the persons who are motivated by the opportunity not only to make money but to be of service, to help manufacture an opportunity for themselves, and for their communities and for their airports -- and you are talking about the whole configuration of people.

You are talking about, as I said, real estate brokers. You are talking about developers. We are talking about appraisers, mortgage bankers. We even include planners, both private and consulting types of planners.

We have members of the industry who are in organizations such as the Society of Industrial Realtors, which is highly specialized in this arena. The general aviation industry is large enough and important enough, it seems to me, that it would not be out of the realm of possibility to see some kind of specialization and organization in the real estate industry and relate to it not only on a place-by-place basis but on a national basis where there might be opportunity to create some policy.

Who knows what can be invented? Who knows what kind of development can be generated? Who knows what kind of laws we might be able to pass if there was this kind of input at a high policy level as well as the operating level in each community at each of these airports?

There is an enormous amount of opportunity it occurs to me, not only for the service as I said, not only to try to bail out the problem to help acquire more land but to enjoy this creative responsive kind of thing. And I think that is the one message that I really need to leave with you this morning.

I might be able to talk in response to questions all the better if you have specific things in mind, but I think that one of the important parts of this is that the industry needs to begin to interest the real estate entrepreneur, this person who may think of himself as a wonderful impresario, and, believe me, those who do industrial parks and office parks are that. Those who undertake development of large projects, whether they be apartments or whether they be other kinds of things, are highly creative, highly responsive, very carefully moving people and they can be a very, very valuable resource.

They will have market insight. They will have understandings and perceptions that I think you will find extraordinary in terms of what they can do with an idea and with a problem. And I think that the general aviation industry, the operators, proprietors, the developers, pilots, and manufacturers have really been too much focused on those kinds of things that seem unique to the airport and they talk mainly to each other but not as much to the real estate industry as they should.

I think maybe it might be useful now if you could have some questions for me to kind of discuss maybe some of these particulars.

MR. CAMPANELLA: My name is Angelo Campanella and I have a question. I like this idea tremendously and I can envision it around an airport that I am very familiar with. Take the last mile of an ILS approach to an airport, what can we do with it? One of the things to do is to put a golf course in, and that is probably a copout as far as the real estate industry is concerned. What is the better thing to do with it? This is a very direct question, I realize.

MR. FORBES: Well, I didn't say I was going to.

MR. CAMPANELLA: In the general aviation airport when you look at the ILS area, it is well below 65 Ldn. It is probably -- maybe 60 times. I would say it is usable for real estate but the G.A. does not like to see that happen.

MR. FORBES: I am sure I cannot really respond to what it should be because I am not familiar with the situation. I would have a reaction, I am sure, later on after some study and some introspective thought about it.

MR. CAMPANELLA: Okay.

MR. FORBES: But I think if you pulled together the team of a developer, some people out of the mortgage finance arena, some other types, depending upon your community, you would find that you would get some synergistic response to the problem.

MR. CAMPANELLA: What are the ground rules? Basically it is agricultural, right, but what goes in there must be profit-creating, is that true?

MR. FORBES: I think that is one way to motivate people in the real estate industry, certainly; but I think you would find that, for example, starting off with the golf course idea, that may sound like a copout but that can be a very attractive generator for other kinds of uses, not necessarily residential uses. I do not know that there have been any golf courses developed around an office park or an office park developed with it. They may have a golf course but it occurs to me that that is not so far out of the realm of possibility; however, that would depend upon the terrain. It would depend upon the development capability of the community. It would depend upon whether or not you had an office market that had some needs that might be met and whether there is growth in the community, what the pattern of usage at the airport might be.

It seems to me that the airport office park with a golf course and some other kinds of uses tied to it might be very exciting, very attractive sometimes to industry. If you have that kind of space and the opportunity, that might be the sort of thing that you could go to the representative of an industry and say, "How about this kind of thing?" And you will find a response forthwith. There may be some completely wild ideas that may sound wild but might be highly successful.

MR. CAMPANELLA: So you are suggesting the brainstorming approach?

MR. FORBES: That is one way of getting into the definition of the planning issue; yes.

MR. CAMPANELLA: Thank you.

MR. FORBES: You are welcome.

MR. JAMES THOMPSON: We have had planning tools for use around the airports for years. I know the CNR (Composite Noise Rating) method was developed way back in the 60's. While we have had planning and the planning could have been used, it has not been used. One of the things that seems to be important is the commitment on the part of the zoning authorities to accept the plan and to try to live with it.

We heard last night how independent the zoning authorities are. Does it not seem to you that an accepted plan, a plan that has been accepted by the community, on the basis of that plan people make commitments of their own; financial, let-living, whatever? It seems that that plan has a level of importance and that should not be ignored, and a good land use plan is not complete until there is agreement with the zoning authority that they will give appropriate and reasonable consideration to any variations of that plan and that there should be some sort of liability.

MR. FORBES: That is a tough issue. I happened to have participated as a member of a zoning party of an Atlanta reliever airport. We have not had this problem but it is not very far from possible. The Charlie Brown Airport with its five jurisdictions I believe, includes Atlanta. This is a good example I think of a place where you can run afoul of the inertia on the one hand sometimes, with the zoning policies of the community or a group of communities, and the dynamics of the general aviation airport on the other.

Yet, you can see those things reverse and you can have a plan for an airport which may not be responsive to the community as the community's needs change. Likewise, you can find the zoning authority willing to make an awful lot of changes, that you do not want to have made. I think that some of this is an outgrowth of the very close kind of planning, almost closed planning that I mentioned earlier, associated with airports.

They tend to be projects and many times I think airport operators and developers or public agencies, commissions, what have you, tend to say -- Here is the plan. If we are going to get the money, we have got to have this plan. It has got to be approved. It is sometimes almost "here it is" circumstances. Most governments will respond to that, most zoning authorities, planning authorities will respond -- and I think it might be put into the zoning policy, but it strikes me that there has not been enough dialogue between those who are developing the airport land and those who are implementing the zoning.

MR. THOMPSON: The zoning people are not about to adopt something they did not have a part in developing.

MR. FORBES: Well, there is a resistance to it but there is also very frequently a willingness to participate. And one of the things that sometimes

happens is the folks who do the zoning are separated from the folks doing the planning, or there is not that much communication.

MR. JACK SWING: I am Jack Swing with the State of California. One of the concepts that one hopes to accomplish in achieving let's say noise compatibility land use is somehow to match the land use of the people, with their life styles, to the noise environment. One of the ways you try to do that is through this concept of a disclosure clause, explain to people what the noise environment is at a given site before they buy or rent or lease. What I would ask you would be to comment on is a simple mechanism for getting this disclosure clause between, let's say, the purchaser, the buyer, the renter, the leaser, and the person that has the property to offer. What is a reasonable mechanism for getting that information transferred so that it really means something to the prospective buyer and they don't see it until they close escrow and there it is all of a sudden, a footnote on their deed and they had never seen it, before? Have you ever seen that?

MR. FORBES: It is a matter of some difficulty because you have so many people involved. Many of the real estate agents or brokers who are operating in the arena are potentially involved.

It strikes me that one of the best ways would be to try to communicate to those individuals through the local real estate board and through them therefore to the person who is buying or selling the real estate product. But it is a problem of very substantial scale. That is, the best organization is the organization which does tend to centralize.

The other place where it might be done would be through -- since not everybody is a member of a local real estate board -- would be through state licensing procedures and that kind of thing. It is a very difficult kind of thing to conceive. One way might be to try to reach some of the developers who are in fact doing it. Now there, of course, it might not be in their interest to have this kind of disclosure.

MR. SWING: That is the general problem we face and we also question the interest of the real estate broker. He tends to represent both the buyer and the seller, alternatively.

MR. FORBES: Well, the broker technically is the seller, but I recall this. As the aviation industry increased its activities in Atlanta, I happened to be involved in some activities around College Park. I was amazed to find pilots buying houses virtually under the approach zone as they were converting to jets. You know, these were people who were complaining. It was the commercial pilots, the people who were complaining in the College Park City Hall about the noise, they were some of the people who were buying the houses.

MR. SWING: Gee, we always thought that was great compatible land use, with the pilots around the airports (Laughter).

MR. FORBES: I always wondered about that. They loved those noises, I guess.

But it is an extraordinary problem because the industry is representing the seller. And one of the reasons the industry should be

able to be at the front end of the planning is to try to get that land moved into the kind of use that would be productive for the airport, for the community, and not a problem for the wrong occupants, which we have done so much.

And this speaks to the issue of too much closed planning in the airport projects and not enough planning that would extend into the community - and one part of the community is the real estate industry. So, I think the real estate board is probably the best route for the home builders, that kind of group.

MR. SWING: Thank you.

DR. BRAGDON: Thank you Dick. Our second speaker is James Scott who is President of Scott Appraisal Services. The whole field of appraising, and its relationship to general aviation planning, is extremely important. I think this is one of those elements in the matrix we talked about the first day that is many times overlooked by the aviation community and planning community, and I think this subject is a very critical one to all those here today. James Scott.

MR. JAMES F. SCOTT: Good morning, ladies and gentlemen. After that introduction and a few kind words about appraisers, it makes me feel a little bit better about appraisers, it makes me feel a little bit better about many of the unpleasant experiences I have had testifying in courts, especially in areas of condemnation in the vicinities of airports.

The comment about commercial pilots complaining about noise was interesting to me because I have testified as to values concerning properties where people had not only bought a piece of land directly under the flight pattern but moved in and in less than a year complained about the noise. I think that is probably a caveat emptor. They know the noise is there, they buy it with full knowledge. I have sympathy with them but not to the extent I should.

Also, I think perhaps that one of the reasons the concepts of values have changed, I think, is because airports and aviation have changed a little bit from the era of romance now into a pure industry. For the commercial pilot again to complain about the noise he probably said -- and I don't know but I am assuming this is what he said because I have heard them before: The reciprocating engines just weren't that bad. We could put up with it. It was noisy but the noise levels were different, the peak sound did not last as long and we were used to it.

But I ask you, ladies and gentlemen, where in the hell were these pilots when jets came out during World War II and the transition was taking place? It is like the person who builds a single-family house adjoining almost any major highway and sets it back forty feet because that is all it requires and that is all the driveway he wants and then complains rapidly as the traffic increases and the noise increases and he feels he is upset by what is going on.

I feel that many of these people know the problems they are getting into but for many reasons of their own they have chosen this and then suddenly

realize what is going on. Part of it perhaps is the romance is gone, the blush has gone off the rose a little bit and now we are talking about real industry.

My assigned subject originally was in financing and lending. Well, lenders will lend on anything that has value and anything that has security and to the borrower who can reasonably prove that he is going to be able to pay it back. So I think we can take that concept towards the lender and almost dispense with it at this point because a lender will, as I said, lend on anything that has value and lend to a borrower who has the ability to pay it back.

Let's look at it from an appraisal point of view and I will go back briefly and tell you why I am so interested in real estate and why I am so interested in appraising and in aviation and in airports. I was I think about five years old when my father bought a farm in late 1928 and paid a very large price for it. We moved out in the country so about the first thing I remember is the conversations of plummeting values. Milk had gone from something like \$2.00 a hundred down to something like five cents a hundred, almost overnight. So you searched rapidly and drastically for ways of creating value and I can remember we logged off the land.

We leased hunting rights. We leased fishing rights. We gave rights for people to go down and gather reeds to make baskets out of. We raised every crop available. We ate the things that we shot. We trapped everything that was fur-bearing that you could sell. And this is the type of thing you do. And you lease additional land for a crop that can produce something or you lease land out to somebody who can make it more productive than you can.

So what you are looking for is something that will produce value. As far as aviation is concerned, I was fortunate enough to be qualified as an aviation cadet for the U.S. Air Corps and all those things they say about not volunteering, of course, are always true -- you all know that. Because of my size, if you are over five ten they automatically said you were a bomber pilot. So I volunteered for everything, including the bombers, hoping that I would not get into the bombers.

And the day of graduation I was delighted to hear them say we have a few open assignments. We are asking for seventeen pilots to go to a special twin-engine fighter project. So I stuck my hand right straight through the top of the hangar and I was one of the first to be accepted.

I sat there for a week and I got ten days leave and by the time I got home I was sent to navigation school. Now I got suspicious. You do not do too much in navigation, especially celestial navigation, and without telling me what I was doing, the next thing I knew I was sent about six weeks later to Pensacola.

I went back to basic flight school and learned to fly the PBY. Now, a PBY is a long way from twin-engine fighters but I got an appreciation of real estate of all types, of how important a good ramp is, how important a good beach is for beaching. You learn to sail the things as well as to fly them.

And I was in rescue in the Pacific and in the Pacific, during any kind of a conflict, you learn a different kind of appreciation for real estate, real estate that you can manage to get hold of and protect and have it do something for you.

So, I got into real estate brokerage and then into real estate appraisal, in the State of Florida first, and worked for a firm that appraised for reevaluation for large municipalities for tax purposes. There I got a good feeling about airports. One of the airports we appraised, in and around the airports at that time, was the Fort Lauderdale Airport.

I moved from there to Rochester, New York and was there for about two years and during the time I was there I did a study on Rochester Airport and Buffalo and Syracuse, and a lot of it was in connection with a land use plan and a reorganization of the land of Rochester, New York near the county airport. And I found that what they had been doing for years -- and they are finding how in a series of studies on the west coast -- is that the value has been placed in the past on primarily two things.

One is what did it cost us? We will try to get some money back out of it; lease or buy land on the airport and around the airport and arbitrarily -- Of course, you cannot help but see that the possibilities of political implications would sneak into something like that because a board could arbitrarily set up what is the value of land on the airport or adjoining the airport if the municipality owned it. That has been going on for years.

And I found one instance where one politically-favored group has one hangar, about 15,000 square feet. They also had about 10,000 square feet of office space for which they paid the magnificent sum of \$175.00 a year.

Now, the lease from the one hangar alone pays the entire rent. They had a great deal of land and ramp space facing them. Of course, now they have changed and they have recently had a reappraisal of the entire land on and around the airport. The company that bought my firm out when I left recently completed it.

Let me talk about a few things that have happened around the country and how rapidly land goes, for what it is used and how you really just cannot plan enough about land in advance.

Let us talk about Memphis. I have flown into Memphis quite a few times, nice airport. They have a fantastically good industrial park around there, if you have ever been over there. I have appraised several large properties over there, including the sort-of illfated Admiral plant that sold five times I think in six years. I was referred to Doug Buttry over there, who is with Federal Express, not to anyone at the airport because they said he is involved in real estate and we are referring you to him because they have just acquired ninety-five percent of the available industrial land in the vicinity of the airport over which we have control.

So I talked with Doug about it and, of course, that airport is expanding rapidly, partly because of deregulation and partly because of the

increased emphasis on air travel but a great deal because of the Federal Express itself. They have a fleet right now of twelve 727's, thirty-two Fan Jets, and varying between ten and sixteen small aircraft that they use. They just bought thirty-seven 727/100's and they expect to have between fifty and sixty 727's in the next four years.

Now Federal Express, who handles only small, high-priority, time-sensitive packages, is moving 75,000 units a night through Memphis International Airport and they have no idea of what it is going to expand to except they are attempting now to expand through not just flying high-priority and time-sensitive things; they can go into air freight and air cargo and carry passengers. I think with deregulation you may find some more of this and some more discounted fares. And you will find more use of airports twenty-four hours a day.

In Canada and Alaska, it is reported to us that they are carrying freight and passengers in the same aircraft and this has been going on for years. As a matter of fact, that was the way the bush pilots and the small airlines got started in Canada and Alaska.

What he is doing up there is buying land, buying and/or leasing land at about the same rate as they pay off-airport, about a \$1.00 a square foot. Now, that is \$45,365 an acre. The land closer in than that has a commercial connotation. They are paying as high as five or six or leasing on the basis of around ten percent of that.

In addition to this, he told me we should remember the fact that in certain airports and in Memphis especially, I think it is something like \$94 a linear foot that they pay in addition to the leased price of the land for exposure of a building to a direct ramp or apron access, and they are paying something like \$6.00 for exposure of the building itself to the ramp.

(Slide) Now to give you an idea of what they are doing there as compared to SETAC, most of you are probably more familiar with SETAC than I am. I have got quite a bit of information about it and talked to the gentleman who happened to be a good friend of mine who is doing the on-site appraisal for SETAC. SETAC looks like this in the yellow, which is predominantly around it and is single-family residences. The brown enclosure is medium and the light and dark brown is high-density residential, and the gold is office.

The area that they have is some 906 acres. They started with this in 1942 and they are now up to 2,200 acres in 1978, and this entire package, as they have it envisioned here, is up to 14,400 acres, which will bring it up to the size of Dallas-Fort Worth. They hired the appraisal firm of Bruce Allen. Bruce Allen did the appraisals for them.

He immediately made a search of most of the major airports -- San Francisco, Los Angeles, Denver. He made a few other airports but those are primarily the ones he went to -- Minneapolis-St. Paul as well.

He found the same thing that I found out earlier; that the values have been raised; one, by cost; two, by an arbitrated decision by a board. But now they are going more and more to competitive uses of the value on the airport as competitive to those off the airport. Of course, it goes nothing but up.

I think we should stop and think about an airport. You gentlemen are professionals that -- Most people look at the airport as a quick place from here to there. They see a few billboards, they do not think about them. They drive by, hope they can find a parking place. If they are coming out, they try to lease a car either on or off the airport. They know there is a bar, restaurant, any number of other things. But the thing that they just do not see is that it is real estate, it is all real estate and it is worth a hell of a lot of money and it is generating fantastic sums of money for a lot of people.

Of course, the biggest sums you will find is in the concession, such as Rent-A-Car will probably pay as much as anyone else. It is up so high now that they bid for it and we were surprised that a consortium of small individuals outbid one of the big four in Fort Lauderdale-Hollywood International Airport. So they moved in; took six of them to do it.

To give you an idea of what it is doing to land value -- If you are familiar with the Fort Lauderdale airport, as you come out of the airport onto U.S. 1, right on the corner, right-hand side, which is a very choice piece of real estate, is a place that used to be called Everglades-Rent-A-Car. Now it is Trailways-Rent-A-Car, and of course Trailways has a suit against them for the use of the name.

When that was purchased six years ago it was bought lock, stock and barrel for \$500 thousand. We appraised it for them on the value of a going concern and found out that after you take out all of the costs incidental to the business itself, giving a good profit to the owner, reasonable return on everything, good management fees, it was worth about five hundred seventy-five -- which was about right because the man who sold it was in difficulties so you see they bought it on a pretty good deal. And besides that, it was one of these transactions in which someone from New York flew a suitcase of money down to pay for it, all in cash.

So that is highly negotiable. He did not have to worry about the financing of the bonds.

We recently did an update on this appraisal and using exactly the same method we did before, the same methodology to find out what value would accrue back to the land, it was almost \$2 million.

Now obviously the land is not worth that much money. For the usual purposes it would be probably worth maybe \$700 thousand. But that does give you an idea of what is generated on lands on and next to the airport. Although this was not part of the airport per se, it was separated from the airport only by a service road and a railroad and it was between the railroad and U.S. 1.

Another instance of what is happening to land values and uses and how the uses are changed is down at Miami. In Miami, across from the National hangar on LeJeune Road, east -- and I think it is 24th, 26th, along in there -- about five years ago we did an appraisal down there for the same company and found that the land uses around there, all those older buildings extending over to the canal, were primarily storage. Some of it was sort of dead storage or a few mechanic's trades going on. Most of it was not too valuable.

Probably twenty percent at the most was airport oriented. If you go down there now and drive -- and incidentally, there were two automobile agencies, rent-a-cars located in the area of perhaps within thirty blocks and these were off the main street. Now eight months ago there were eight automobile rent-a-car agencies located in there. One of them just bought almost half an acre of land that is completely covered with buildings, most of which is going to have to be torn down to be able to park cars adjoining the airport. And land values go roughly from \$3.00 a square foot for land alone back in this tier where he is now on up to \$8.00 a square foot -- and the airport generates all of this for him.

So the thing that we have to keep in mind is, one, airports, like seaports before them attracted people, attracted industry, attracted commerce. It attracted everything, all the good and all the bad. Canal ports did afterwards, railroads you only have to stop and think of New York's Penn Station and Grand Central Station. Grand Central with the Commodore Hotel across from it, you did not have to get very low in the building before you knew the trains were going through. As a matter of fact, when you were very sensitive you knew when the trains were going through all the time. So this type of thing with noise and disturbances by proximity of something that creates noise is not new at all.

I recall one of my uncles who lived all his life, and just sold it a few years ago, who did not work for the railroad had a house that was about eighty feet away from the main line of New York Central. And in his declining years, of course, the New York Central was not running as rapidly but you could carry a conversation with him and as the train approached, he stopped. As the noise diminished, he would continue on with his conversation as if it had never occurred. It is sort of a conditioned reflex.

But we are getting more and more aware of the fact that we cannot put up with this even if we enjoy it. He enjoyed watching trains.

As a matter of fact, there is an area here in Atlanta which on one street as a matter of fact the houses are in high demand because sitting up on a ridge behind the houses about 300 feet back is where the trains go through and train buffs are buying them. I do not know of many jet buffs buying directly under the flight paths, but some people are attracted to certain areas where others are definitely repulsed by them.

But let us look at SETAC one more time. After his study he found out more and more of them are turning away from cost, the cost as strictly book value. I am not talking about value -- what it cost to acquire it, what cost to build it, and as they were depreciating it what they should get as a return

on their book value. And he found out they are now going almost primarily to what the competitive land value is off of the airport.

About the only difference you will see in values on an airport and off an airport is that they tend to make their leases based on an entirely different rate of return, shall we say a lower rate of return. They are basing it on internal rate of return.

Competitive land a few years ago, when their appraisals were first started around there, the leased land netted around ten to eleven percent and that covered around nine or ten percent interest and one to one and one-half percent for taxes; whereas the airports primarily are on a bond issue basis and their leasing land. Recently leases were made in the SETAC area with a return of about seven and a half to eight percent of value; whereas on the airport now it is twelve, thirteen percent.

So competitively, it is still a little higher but they are getting closer and closer to it all the time.

So the SETAC was originally appraised five years ago at that time about \$3.00 to \$4.00 a square foot was the going rate. Now this is higher than what I have mentioned before of \$1.00 and \$2.00 which was a few years ago. This was about seven years ago. They call this one overall value but they considered it primarily as similar to the light industrial on which you will find some commercial enterprises; sales, service, some sort of warehousing and transportation type of thing going on. That has now gone up. It is increasing at the rate of approximately 15 to 17 percent per year over the last five years.

Wondering whether or not this was a true pattern or whether this was indicative of the airport only, they made a study of the consumer price index, the overall price index and for the period of time and without compounding you would see we had about fifty percent increase, comparing that to the consumer price index and the consumer price index overall was 53 percent for the same time.

So it is slightly over ten percent per year which makes it only a little bit less than the airport land.

Now, the airport land, of course, is growing. Everybody knows it is highly in demand. When you announce a plan that is going to expand 900 acres up to some \$14,000 an acre, you know there is a demand. So everyone expects that the prices are going to be going up higher and higher.

He found out that the potential uses, as you are getting closer and closer to the hangar-terminal areas, was about \$6.00 to \$8.00 a square foot. Now, that is not commensurate with commercial land as you think of it say in a downtown area but it is more than many shopping centers are going for in the area, much more. Because you can buy shopping center land and office park land sometimes now between \$1.75 to \$3.50 a square foot -- but they did not break it out.

At first they thought that they should have someone who had ramp access directly onto a ramp pay more for rent than the man who is directly behind it. They have changed their theory on that now because the man who is on the airport directly behind the ramp or on the ramp either one, if he had to move on the airport would probably be paying 20 to 50 cents more.

To give you another idea of how you can tell what land values are, especially for light industrial warehousing, moving of materials is going up in value. If you would draw a circle around Hartsfield International Airport and put it in quarter-mile increments coming away from the airport, you would find it was probably increasing at the rate of twenty percent per quarter of a mile because it costs money to move things. It costs time and money to move their cargo freight and high priority stuff, so the closer you are to your point of departure or your point of arrival the less money you are going to spend the more valuable your land is and the less your overhead and costs are, therefore, the more valuable the land.

So it is analagous to almost any other kind of airport use. Hartsfield, you are probably more familiar with that than you really want to be. It has put out some interesting publications recently and one of the things that is very interesting to read is the issue of the airport facility revenue bonds. If you read through this very carefully you will find what they are doing with it and you will find how valuable the real estate is and how desperately the need and how rapid the growth is in and around the airport itself.

There is no question about the fact -- the gentlemen's name I don't recall. He used to speak for General Motors. He said the greatest change in the century was the advent of the jet airport. It had great effect -- and this one thing impressed me. About the last thing he said was it has greater effect on real estate than anything else, any other single event because now in 24 hours you can be any place in the world by commercial aircraft. Stop and think, he said, for example a generation ago it would take college students going for a ski vacation, a week by water and a day or two by rail each way and it would cost a barrel of money and take a lot of time.

Now for very, very low discounted cost fare, below \$500 anybody from the east coast can fly to the Alps and have two fantastic days of skiing and be back on the campus in a little over three days.

Hartsfield, I will have you a quick idea of what their acquisition costs are and what they are planning on doing. They are going to acquire a total of 282 acres, phase one, two, three and four. And that is going to cost them a total of about, budgeted, \$18.6, which will run closer to \$20 million. Their acquisition and administrative costs will run them about a \$1.38 per square foot on budget and about a \$1.61 on what they anticipate on what their increased budget will be. Plus, the holding costs of the land, the additional improvements, so on, that will increase it at least ten percent per year. There is no question about it at all.

There has been heard some questions earlier about impacts and what you do with smaller airports. The Minnesota Department of Aeronautics prepared I think a pretty good study of the impact -- how many of you have this? Most of you have got it, have you not?

It is the study of socio-economic impact of aviation on selected communities. It is prepared by the Minnesota Department of Aeronautics. It goes through a series of small airports, small and large airports and the specific benefits of airports, the number of jobs that they create and the money that they generate for the community. It is not all directed into the airport; most of it is indirect because as anyone knows the cost -- well, some of you gentlemen have come quite a few miles to attend this seminar. If you go to other seminars, especially the ones that are designed to bring your wife and children to, you know you are going to spend far more money when you get there than the cost of getting back and forth. So it is very important to the community.

The smaller airports, speaking now of general aviation, are somewhat affected the same way as the larger air carrier airports, but some of them are being choked out by unrealistic people.

For instance, I could not believe my ears when someone told me, this is what made me supersensitive. I guess because they had aircraft at Peachtree-DeKalb at the time.

This one is right after the jet went through the top of an apartment building because of ingesting several hundred starlings one morning, and one of the commissioners of DeKalb County really said the best thing to do was not to do away with the land fill that attracted the birds but to do away with the airport and have one big land fill.

Now, DeKalb-Peachtree generates a fantastic amount of money. They are getting more and more jets in their facility all the time. I will give you a quick example. Over a period of five years my tie-down space went from \$40.00 to \$50.00 to \$70.00 to the point in which I was taking the space I thought was best for me. It was leased space that EPS had and I was paying \$70.00 a month for it.

He said, "This is the best space. Why don't you move it from where you are up there; I'll give you a break." So I had to move it almost completely off the airport and the only way I could stay there was to lease space in the building adjoining it. That gives you an idea of what is happening on the airport.

I do not know if you are familiar with the way it is growing up there or the way it is run up there -- ILS, runways. It does not run 24 hours a day. They cannot expand very well. Where they are built tightly around it they cannot, whereas Fulton can expand. They have more land to expand, although they do have a land problem.

The money that generates value comes not just from the airport itself, the terminals, the air freight. It comes from all the concessionaires and there are hundreds of them, everything from the one who sells flowers for a buck and a half a piece for a rose up to the people who are furnishing all

the food for the airlines. The same thing is true on smaller airports except on smaller airports you find individual businesses rather than large businesses, doing things like avionics, repairs, reupholstering of aircraft and things of this type.

So I think probably what my whole thrust is that use, use makes value. Nothing has value without use and the better the use, the more intense the use, the more concentrated the use, the higher the value becomes and as the uses within our airports grow greater and greater, and greater, the values increase.

There is one other thing I should mention; this is the attitude toward air carriers and the people whom they call the signatories, users of airports, the ones who sign letters on the bonds as part of the indebtedness. They were given preferential treatment in the past. Based on what is happening at a few airports now, I don't think it is going to be so in the future. I think they are going to be charged exactly the same rate as other users in the airport.

Now this is something that will be taken up as leases expire and new leases are coming up. The fact that they put the money into it that made it possible does not justify giving them a discount because they are going to profit anyhow and they should be reflecting their investment in the airport into the charges they are making for the uses and services they are providing.

I do not know quite enough about that to make comments on it; however, I can say that the value of airport land does nothing but go up. It is far more than most people realize and the need for it grows almost every day. Thank you.

DR. BRADGON: Our next speaker is Stan Green. Stan is with GAMA or General Aviation Manufacturers Association in Washington, D.C. His presentation this morning will be on the role of aircraft manufacturing alleviating general aviation noise.

MR. STANLEY GREEN: I would like to start off not with anything that has to do with my basic topic of what the manufacturers are doing but as sort of my personal note on this conference. I was a bit apprehensive at first perhaps because I saw EPA on the headliner of a conference on general aviation noise and that gets me a little nervous. I want to make it very, very clear and plain that I am no longer apprehensive. I am appreciative.

I think this has been a fabulous idea and I think EPA and Georgia Tech deserve one great hand for it. I think that the idea of getting the group of people that we have had here together, listening to some other sides, politics of which perhaps has no answer, but hearing some of the other aspects of planning has been one super idea and I would strongly recommend that we get some other conferences going.

I would strongly recommend that EPA not only sooner but push them and I think you are going to get a much bigger second round group here. I think we can accomplish a lot in this business.

Now let us get to what I have prepared. We heard a lot of statistics and terminology of what is general aviation. I think it is worth giving you a little repeat of some of that from the way we in GAMA see it and will get into the 800,000 pilots and 200,000 aircraft. We will say that is an approximate number. We have got 14,000 airports but, more importantly, we transport over 110 million intercity passengers annually. That is about one-half of what the airlines do but that is still rather significant.

General aviation includes, as most of you are aware, the commuter airlines which are just absolutely growing -- the air taxis and the business and then personal aircraft. There are, as of last week, only 383 airports that now receive scheduled airline service and we service the additional 18,000 communities that have G.A. airports.

We are about 300,000 people in employment. There are 5,000 local and independent businesses involved. Historically, we ship about one quarter of our product overseas and the result of that is about ninety percent of the total fleet of general aviation airplanes in the world are manufactured in the United States.

Beginning in 1970, this decade, the G.A. fleet has grown about sixty percent, from 130,000 to 200,000 airplanes. The number of hours flown has gone up 56 percent to about 39 million annual hours. In 1970, GAMA members and those that report their sales to GAMA delivered 7,300 airplanes. Last year we delivered 18,000.

The shipments of multi-engine airplanes, piston and turboprop, are up 25 percent. The Airline Deregulation Act has proven to be of rather considerable benefit to the general aviation manufacturers. More and more businesses are flying their own airplanes because they are indispensable business tools.

I mentioned there are 383 places in the United States that have scheduled airline services. That is because there have been 120 points dropped in the past ten years and there are 131 additional applications into the CAB to drop from 383, but it is where in some cases there is only one airline or where there are more than one, one of those airlines wants out.

We have got a lot of concerns in our business that we term environmental and they are all related to the airport down here. Now that EPA has reduced its requirements with respect to emissions, all we have got left is noise. I do not think anybody will question the fact that we need an airport at each end of every successful trip, and we are rather concerned about the loss of airports. We are losing airports, as a net, each year. Now, the concerns that we know were once wholly the bailiwick of a civil engineer are now concerns of everybody in the business, from the manufacturers on down.

I said it the other day and I repeat it, noise is an impediment to sales and you try and you work like hell to remove impediments because we are

in business to sell airplanes. Where we are in the noise business, and I guess it has got to the stage to where we are now, we have got to know where we are. It goes back to the FAR 36, 1969 requirements and the objectives of those requirements by FAA were simply they would put a cap on aircraft noise. They put a cap on it because it was clearly escalating.

In 1975 the aircraft that we were still producing had to meet in a retrofit basis on fuel manufactured airplanes -- I do not mean the airplanes in the fleet -- we had to recertify all the production aircraft in 1975 to meet those original limits to quantify these limits for the general aviation jets which we consider those of a maximum gross takeoff weight of 75,000 pounds or less. And we know there are some large aircraft, airline-type aircraft in G.A. service but they will have to meet the airline standards.

But for those in our business fleet we had the approach and sidelines at 102 EPNdB. We had the takeoff at 93 EPNdB. We had to go through a number of things to get those aircraft to meet the requirements. We used hush kits primarily, a muffler-type system; special operating techniques, which reduced the way the airplane could be handled to a very specific formula which was required and re-engining.

But the re-engining was usually accompanied by other modifications to improve the performance of the aircraft. The engines used were certified in 1971-72 time frame. There were just two of them, the Garrett Jet TFE 731 and the Pratt-Whitney JT15D. We had two engines, one about a 300 pound thrust -- I will add here that the results of re-engining were dramatic, substantial reductions in noise levels were one of the benefits, primarily reduced fuel consumption. So, we had one with a 300 pound thrust engine, the other about a 200 thrust engine. That was your whole choice.

These engines were also utilized in new aircraft designs as well, and designs that had substantial margins between the regulatory allowable noise levels in lieu of future growth of both the engine and the aircraft; the engine's growth potential so it could be used in other aircraft, the aircraft's growth potential to expand its market capabilities.

And we know the regulatory need is always toward tougher requirements and now with FAA's latest rules, the 1976 notice which led to the 1978 FAR 36 standards.

As I pointed out earlier, we export about 25 percent of our total product. Obviously, we are very interested in the civil aircraft market throughout the world. It is a big percentage dollar-wise so we work rather closely with the International Civil Aviation Organization, ICAO, and its committee on aircraft noise. We like to use the word insist but we hope that the U.S. and the ICAO rules will go hand in hand. We cannot afford certification at two different standards.

I think most of you people will agree, who are knowledgeable, that European standards, their treatment of noise, that at least they are as good as us and many think they are a lot further ahead. It was the consensus of

ICAO at the fifth meeting, CAN 5, that these new levels that FAA now uses be adopted. These in fact were adopted, utilizing the expertise not only of FAA and EPA, who participated at the time, but of the foreign airworthiness authorities and noise authorities from the major European countries.

To quantify these new regulations as far as they mean for our jets, the approach limit props from 102 to 98 dB, the sideline from 102 to 94, and the takeoff from 93 to 89. I would like to put a viewgraph on right now.

(Slide) All right, the first viewgraph deals with the takeoff noise levels, the top solid line labeled '69 FAR 36 is the FAA original '69 regulation. The triangle shows the noise level of many of the original aviation jets, including the Lear series, the Rockwell series, Lockheed Jetstar and the Grumman Gulfstream too. As I mentioned earlier, when the aircraft was still in production we were required to reach the '69 rules. We did so through a number of techniques, including cutback and various sound suppressors.

These aircraft are indicated by the hexagons; the original aircraft, of course, are those triangles. And you see where some of those are on the scale well above the '69 levels. The triangles and the hexagons fit into the various places.

Some aircraft were modified by re-engining with the modern turbofan engines, and these aircraft we have shown as the square. There is one there, and another one there. The symbol, whether it is a triangle or hexagon or square, is filled into a solid symbol. It means we have used cutback as part of the required operating technique. The results of re-engineering are oftentimes dramatic. You will note the open triangle at the 106 label and if you take a look at that little square back there, that is the same airplane. It is 93 from 106, a drop of 13 dB and rather noticeable.

As is evident, the modern turbo-fan-powered general aviation aircraft -- those are designed from the ground up -- are shown by the circles and those are in most cases substantially below the 1978 limit. It simply means we view noise as a prime design parameter.

(Slide) Now if we could turn to chart number two, which shows the approach levels and the symbology of the same, with the exception of course that you do not use cutback on approach. The noise levels in the newer designs are in all cases below the original aircraft. Turn the slide off.

The new engines that we have not scheduled for certification in the next few years -- I think I did mention this yesterday -- in addition to having a rather dramatically improved fuel specific, are going to be much quieter. There is a new class of aircraft, the FAR 24 aircraft. They are going to be turboprops, they are going to be used in close-in communities and they are going to have to be and they will be quieter.

In the propeller-driven aircraft area which includes the turboprops, we also recognized in 1970-71 that we were going to have to do something about the noise. Now, we did not feel, frankly, that we had a real problem back then, except in the pure economics area. Switzerland had introduced its noise

requirements to take effect in September of '71. Germany had noise requirements that were taking effect sometime in 1972, and they were different and they were going to require certification in each of the countries that adopted a different noise requirement.

It was our view that we had to get, as we did in the jets, an international standard acceptable throughout the world.

In April of 1974 ICAO adopted a recommended practice establishing such limits. The FAA adopted these limits in January of 1975 to become operative on January 1st, 1980. The requirements for propeller-driven aircraft are not in effect; however, in 1980, January 1st, every airplane produced must meet the levels or come below those levels. At the end of this year, no propeller aircraft can receive an original airworthiness certificate -- which means it cannot fly in the system -- unless it has met the standard and been certified.

When the work was started by ICAO in 1972, as I mentioned, a major portion of the fleet then currently produced did not meet these levels and we started work because it takes anywhere from one to three years to recertify an existing aircraft for noise problems that we would have if we did not meet the requirements. When you stop to figure that a company like Cessna who has upwards of 25 models, Piper about the same, even some of the smaller companies with three or four models with limited engineering staffs to be devoted to this subject, you recognize that the best that a company can handle would be three or four or five a year if it still wants to continue to produce and design new aircraft.

And I am sure many of you are aware there is a headhunter in the audience here from one of our Wichita companies. I notice he brought shackles and chains to get some of the engineers back. We are short on engineering talent in the industry and it is a real problem. We just cannot take on major undertakings of trying to recertify the whole fleet this year. For instance, to try to meet that 1980 limit, as a consequence it was evident by the end of 1976, all aircraft that were under 6,000 pounds has been brought into compliance with the FAR 36 levels, Appendix F. By this summer, by the end of August, all the aircraft will have been certified.

Now we have looked back and we have quite a bit of engineering work going on in further reducing the aircraft noise. I think we explained yesterday and there is no sense going into it again today. As you know, we try to better these levels. We are obligated to do so but it is also good business practice to do so.

From the hardware point of view, we are attacking the noise problem through typically technology development and it is primarily a propeller problem so we are looking primarily at propellers. There is a fair amount of work going on sponsored by the government, NASA, EPA, FAA. There is a lot of in-house work going on in new propeller designs as the first stage. There is some work now going on in muffling which is now primarily a benefit only to interior noise but if we can get the prop noise down then yes, the engine will become an issue and we will be looking at that.

But we do not expect anything to be certified in the fleet from these efforts for the next five to ten years.

The more immediate results in noise reduction are going to come about through changes in operating procedures of aircraft. We are accomplishing this through what we call GAMA Specification One. GAMA Specification One, usually known as the specification for pilot's operating handbook, is an industry-wide standard that is used by manufacturers in preparing their own POHs, pilot operating handbooks and airline manuals. We designed it as a guide to provide a handbook to the pilots that would be of maximum usefulness as an operating reference handbook and in addition meet the Government's requirements that requires such manuals to be supplied with each aircraft.

The specification has been used successfully for a number of years now and we are now in the process of revising it to account for other purely operational considerations -- fuel economy and noise reduction. In accordance with the FAA Regulations the original specification provided a maximum continuous power limitation. That is the highest power that the engine has been demonstrated to deliver safely without any time limitation in its use. Airplane performance however does not require the use of maximum continuous power for normal operation, other than for takeoff. Continuous use of this power has a major effect on noise as well as some effect on fuel economy and engine wear.

We therefore have established a limitation on the use of maximum continuous power by defining it as the maximum power permissible continuously during takeoff, one engine operative, abnormal and emergency operations only. Maximum permissible power continuously during all normal operation is called, "Maximum normal operating power," and obviously the acronym MNOP -- because you should never use a term that does not have an acronym.

There is going to be, and in a few cases this year, a limitation, a legal limitation on what the pilot can use. He will not be able to exceed this if he is going to fly the airplane in a legal manner. It is going to be the power he uses for all normal climb and cruise conditions and it is going to result in a lower noise level of typically from 4 to 9 dB less than the same airplane would make at maximum continuous power. All the performance information the pilot will have in the POH will be based on the new power limitations. And if you ever want to hear a battle between the advertising people and the marketing people in the companies when it was determined that the advertising matter is also going to have to track what is in the pilot operating handbook.

The 200 MPH airplane which really does about 165 knots, maximum continuous power, is now going to drop down anywhere from ten to fifteen percent and the advertising people did not like that idea.

I have got to point out that the selection of the MNOP is a judgment factor by each aircraft manufacturer. It is going to vary as a percentage of maximum continuous power at least 75 percent, varying on up to anywhere from 80, 85, perhaps as high as 90 or 95 percent of maximum continuous power. We have got to do this in order to minimize the noise, because you have tradeoffs between higher climb capability, where you are higher over the airport, versus

the lower rpm of the propeller which is the prime noise maker. This is a delicate balance and has been further complicated by the need to maximize the fuel situation.

So maximum normal operating power is going to vary in such a way as to produce the least amount of sound, considering all of the climb and other requirements that go into an airplane.

We are going to have to do some of this type of thinking in the jets. It is going to be more conceptual, similar to the reduced power takeoff information which has been used up to now to provide engine economies. But we will provide the jet pilot with the necessary operating information to minimize the noise of his aircraft. Instead of telling the guy how to fly the airplane on the purely operational basis, he is going to have the capability to fly on a low-noise basis as well. This new information could be used to determine the expected noise level of the aircraft under various atmospheric and operation conditions, such as a lower weight or a high temperature humidity situation.

Without getting into the details of what goes on in a typical certification, where you are looking at prop sizing and blading and engine derating and all of the recertification activities which are rather complex, the engineering expertise that we need is there; the technology is there, there is no question about it. We will continue to do this kind of work. We will continue to work the problem and make the compromises we need at a reasonable pace, being one we can afford and have the people to work. We will continue to improve the noise levels of the existing airplanes, including those that meet the requirements, including those that exceed the requirements today.

It is going to come about through a reasonable way but it will come about. New technology is expected to bring some small increments. We are not going to see the breakthrough that we saw when we went from the straight jet, for instance, to the fan jet. This does not however completely cover our role in the noise issue. We are going to continue to support reasonable rule-making efforts, both in the United States and abroad.

I would like to quickly cover something I hit yesterday. We need uniform airport noise regulations, uniform throughout the United States, but I do not mean the same noise level at every airport. Every airport has to be looked at as a unique situation, with its local topography, with its local noise impact problem but we have got to be able to have the same basic computational methods used to compute what noise level that local community selects so that a pilot on the east coast can fly to the west coast with the certainty that he understands what they mean when they say 99 on an SENEL, if they want to use SENEL, and know that the SENEL measurement is a reasonable one for the local community.

The difference we have seen between Torrance and Santa Monica, with noise levels in one case at SENEL 100 and in another case 88, and one was measured at about 3300 feet from the end of the runway and the other being measured at 1500 feet. The numbers in fact come out pretty close but we cannot tolerate this because we cannot get this information and we have got to have some standards.

A suggestion was made yesterday in a lunch conversation that perhaps a simple index-type of a number would work. I think this is something we ought to explore. We have got to be able to calculate the same methodology no matter where you are in the United States.

Now with respect to the G.A. jets, most of them are about 10 to 15 dB quieter than the large quiet airline jets but since we want to come into the G.A. airports, which perhaps have unique noise problems, we are going to obviously continue to work these areas. One point to remember, however, is that the frequency of occurrences, of takeoffs, approaches and landings, for a general aviation business jet is markedly lower than for a typical commercial airline.

Average utilization of a business jet is approximately 640 hours for the typical airline jet. We have on an average about 10,000 jet operations, both takeoffs and landings, per day at the major air carrier airports. Now, there are some unique cases. In Westchester County is a unique case. If there is a general aviation fleet that met the 1978 noise standards, if it operated into and out of the air carrier airport, there is no way that the fleet at its typical operating frequency would affect the noise level at the air carrier airports. However, when you get into the G.A. airport you have a slightly different situation. There the fleet may have an impact.

Now, we have looked at EPA's thinking in this area and I do hope that EPA gets some more work going on and updates this effort. We have looked at their 1974 comments on the FAA aircraft noise standards and we like one thing we saw in there. I think I would like to read it for a second:

The EPA noise standard for aircraft type certification. EPA said an Ldn of 65 dB is a reasonable objective for airport neighborhood communities -- and I am quoting now, "That because present data indicates that at some airports an Ldn contribution of noise from aircraft of less than 65 dB is difficult to distinguish from other ambient noise, given the environmental noise level other than from aircraft around those airports."

Perhaps we have got to define that remark. Perhaps we need some more data. We calculated however what the effect of the community noise exposure from a fleet of general aviation propeller-driven aircraft would be, meeting that standard and using a statistical mix of aircraft. We computed the Ldn at a point 3500 meters from the beginning of the takeoff roll at 2833 airports, and those airports selected were ones at where 95 percent of all G.A. operations occur.

We also calculated separately for Santa Ana, which has perhaps one of the highest frequencies of general aviation movements, about 100 an hour. At this airport our calculated Ldn from the typical fleet mix was 64 dB. Santa Ana's calculated Ldn for 64 propeller-drive aircraft was then compared with the measured value of 68 from all aircraft noise sources, including a few air carrier flights. It comes down to the fact that if you wipe out all propeller-driven aircraft from Santa Ana, the measured value drops out about 1dB. The same effect is felt at some other airports at smaller magnitudes. This, though seemingly low is to me significant.

Santa Monica is a very good case. The Ldn is 63 with all aircraft, 62 without it.

Now, as Bill Galloway noted yesterday, the attrition rates for propeller-driven aircraft are rather small and the effect of the quieter propellers that we are producing today for propeller-driven aircraft is not going to have a real measurable effect on the fleet, simply that in the past five years we have produced about 30,000 quieter airplanes in addition to the U.S. business fleet and the attrition rate was probably less than ten percent of that and add that to the fleet and you get about 200,000 airplanes today. We probably lost 6,000 airplanes in the past ten years and put 30 in, so the new quieter ones just cannot have an effect as dramatic at least, as we had in the jets.

Now, as to modification of existing aircraft, which was also brought up, to incorporate noise-reducing devices is extremely expensive. Anyone who has gone through a certification activity with the FAA knows that you are talking about six months for the simplest little work, on up to at least three years for a major complex thing such as an engine modification. Our primary noise source is the propeller, as I have mentioned, and to develop a new propeller for a particular engine is as costly as it would be to devise almost a complete new airplane.

You go through propeller engine and vibration surveys. Aircraft performance testing and evaluation are just two items that are extremely expensive and take perhaps nine months to a year after you have got your hardware developed. We do not look at retrofit in this business as being a very fruitful area.

I would like to make one last point, however, with respect to the jets. The introduction of the lower technology jet aircraft has resulted in a reduction of the day-night noise levels around airports served by these aircraft. As these new aircraft become an increasingly larger percentage of the fleet, the average day-night noise levels attributed to all general aviation business jets is going to significantly fall. Based upon our forecast sales and presently expected rate of attrition in the fleet, the airport day-night noise levels attributable to this fleet are going to decrease approximately 5 to 6 dB per decade for fixed activity rate.

We are finding that the attrition rate is greater now. It may be getting noisier down in South America but here in the States many aircraft users are replacing their current jets with new technology jets and the production is virtually sold out through 1983 -- and that is at the best rate we can manufacture them. It is a delightful situation from a manufacturer's point of view to be in. We simply cannot get enough production people and tooling and additional engineering talent to increase these delivery rates much more than we are doing.

(Slide) Now I would like to put on graph 3 for a second and take a look at what is going to happen with respect to the fleet noise levels. Again, this is a consideration of the particular attrition and the levels that are being made right now. There were ten operations per day in 1975 and you can see the line where the ten falls in. And this produced a day-night noise level of 59 dB.

By 1985, with the expected jet mix then, the level of noise will drop to 53 dB. If there were fifty operations per day in '75 and this is typical of what we have got into up in Westchester County, the noise will go from 66 dB to 10 dB in 1985. More importantly, even if the number of jet operations at a particular airport doubles, the noise level still goes down.

If ten operations produced a level of 59 in 1975, twenty operations will mean only 56 in 1985. Incidentally, the dash-D lines on that chart indicate the 65 and 55 Ldn levels that we have been talking about for the past few days.

Go to Chart 4.

(Slide) Here we show you a similar type of reduction over the years for the approach condition. It is not as dramatic as you do have in the takeoff condition, which is, of course, the main noise producer. With five operations in 1975, the Ldn is 56; in 1985 it drops to 51 dB. Ten operations per day, double the amount, the Ldn drops to 54, two dB less and half the number of operations created ten years earlier. I will again point out that attrition rates are faster than we predicted and our sales rates of the new class, the quiet class are higher than predicted. And we expect to better these numbers.

And now we are back to this --

DR. BRAGDON: Do any of those have the night-time penalty or are all of those operations during the day?

MR. GREEN: This includes the twenty-four hour nighttime penalty.

DR. BRAGDON: So the seventy operations are all during the day.

MR. GREEN: No, we have used a fairly good statistical mix of what kind of operations. There are a few operations in here at night. In other words, we basically used a one out of fifteen or one out of sixteen of these operations, and I don't recall the exact number, considered to be after 11:00 p.m. with the 10 dB penalty.

DR. BRAGDON; Thank you, Stan.

Our final speaker will deal with a role which we have not discussed, and that is the pilot's responsibility and role in implementing airport operator control. It is interesting that the airport which we had, Torrance Airport, was presented very capably by Bill, and Ted Elmgren, who is president of the Torrance Pilots Association, is going to discuss the pilot's role at the same airport, which would suggest to me that they are both talking to each other -- which is good, when people who are responsible for regulatory or administrative controls can talk to pilots. Ted.

MR. THEODORE ELMGREN: Thank you very much, Cliff. Good morning, ladies and gentlemen.

You are probably interested in what makes me an expert qualified to address such an august assemblage as this. So to be able to tell you, I went back over my personal history, looking for the answer, and frankly I did not find anything that made me an expert -- but a little bit about me.

For the past twenty years I have been on the staff of El Camino College in Torrance, which is a large metropolitan community college with 26,000 students. I have been the Associate Dean on the Division of Industry and Technology there and I retired from that job six weeks ago.

I am also a pilot and for this past year I have had the privilege of serving on the citizens advisory committee for airport noise in Torrance, appointed by the city council. That has been an interesting experience and I think a worthwhile activity in Torrance.

You heard from Bill Critchfield yesterday, who is the airport manager in Torrance, and he probably told you a little bit about this committee. I viewed my role on that committee while I was a pilot as one to pour oil on troubled waters and I tried to find a middle ground, a compromise if you will, between the pilot on the one hand and the homeowner on the other hand.

You know the old problem of homes around airports and we certainly have that in Torrance and we had to try to find a balance between the economic value of the airport's being in existence there and the annoyance to the homeowners at being there. I noticed one of the speakers referred to annoyance as being hardly an appropriate word when you are a homeowner rather than listening to a homeowner. So on the one hand we had the pilots who said no one is going to tell me how to fly when I am flying. Now, let me qualify that by saying that is an extreme point of view of the pilot. Most of the pilots who have been involved in Torrance in this new program have been exceedingly cooperative, but there are those on the other extreme who are not going to be told anything. And then on the other hand, the extreme homeowner who says, "Shut it down, It is the only way to go. Just close the airport and plow it under." But in all fairness I qualify that too and say that is the extreme homeowner.

We heard from all these points of view, as committee members, and tried to mollify and placate the various concerns. The city council of Torrance appointed the committee and then tried to balance it between pilots and homeowners and that is a delicate thing to do. We did have representatives of both groups and we heard then from people in the community who came in to address our committee about their concerns.

We were kind of a buffer, I suppose you might say between these concerns and the city council. They came and talked to us and then we referred and reported our information to the city council, but middle ground and compromise was our main effort there.

The city council of Torrance, after agonizing over this problem many years, passed an ordinance a couple of years ago that imposed certain regulations upon the airport and upon those using the airport. For example, we have a curfew at the airport that says you may not fly between 11:00 p.m. and 6:30 the next morning, except under special circumstances that require

prior approval. Anybody flying during those hours without prior approval is guilty of violating an ordinance, and I believe it is a misdemeanor. Is that right, Bill? It is a misdemeanor and it carries quite a fine.

You may not do touch-and-go landings except between 8:00 a.m. and 8:00 p.m. on weekdays and on weekends and holidays between 10:00 a.m. and 5:00 p.m., letting the homeowners sleep a little later in the morning on weekends.

Torrance has set up and does monitor the noise situation. They have ten microphones established around the airport in the community and they can monitor the noise level of aircraft landing and taking off there at these locations. It is a pretty sophisticated system and I think it is working pretty well. I certainly want to commend the people involved in the noise abatement program at Torrance for their efforts to educate the pilots and to inform the community about what is being done.

In monitoring the noise, they are looking for a noise that exceeds 82 decibels on the A Scale. That is the maximum that you should impose upon the area if you are a pilot taking off there or landing there, as the case may be. There are a number of variables in this noise situation that relate to the aircraft and they all must be considered.

Stan Green mentioned the propeller as probably the greatest contributor to noise and that is true; it is not the engine, it is the propeller. So much must be done about the design of the propeller in the years ahead. I was pleased to hear him say that things are moving well ahead and we will have quieter aircraft -- and then he said within five or ten years and I was disappointed to hear that.

In addition to the prop, you have got the exhaust of the engine itself and that is a contributor to the noise.

At one of the evening meetings of our advisory committee on airport noise a party showed up at the meeting and said, "I have a muffler that will help make the airplanes fly less noisily." As a pilot I have wondered why we do not have better muffler systems on aircraft. We have them on cars but not on aircraft. So this fellow came in with an object about the size of a coffee pot, maybe a little smaller, or water jug, whatever it is, and said this will reduce the noise on the aircraft. We were excited about this -- this is wonderful. However, he said, "It has not been proven. It is just inventive and here is the first model. It will really do a lot of good."

So, one of the members of the committee said, "Well, I will test it on my airplane and we will find out." But as soon as we thought about that we realized, knowing the FAA is going to say you are modifying an airplane if you put a muffler on it and it violates the rules or regulations and you must make application and have specs and after Congress has acted on it, the Supreme Court has reviewed it, we might consider letting you make this test.

So what happens? This pilot -- who will remain anonymous -- took his airplane and flew it out to a desert strip and bolted this muffler on along with the person who manufactured this thing and they tried it out with a microphone and some noise monitoring equipment. Away out there in the desert,

if it fell off the worst it could do was hit a cactus or jack rabbit -- no danger.

Well, it did not make much difference in the noise of the airplane, I am sorry to say. We had high hopes for the thing. Maybe with refinement it could improve it. It was not heavy. It was not large. It made a little bit of difference but not much.

I have mentioned here some of the variables that affect noise. An airplane taking off on a normal day or cool day, you might have 600 or 800 feet of altitude by the time it crosses the airport border. On a very hot day it might have only 400 feet of altitude. So the atmosphere itself affects the sound impact on the community.

Altitude is probably the greatest thing that affects the noise that impacts on the community. There is no substitute for altitude. So if we can get the airplanes up there, we are not going to bother the community so much.

What is the biggest variable of all in this whole picture is the pilot. The pilot can make the greatest difference of all because the pilot is the man with the hand on the throttle or variable pitch control and working that expeditiously he can have a considerable impact. In talking with Chuck May, who is in charge of the airport noise monitoring system at the airport, he said recently that one of the pilots who exceeded the noise level was called in and came into the office, as is a usual procedure, to talk to him and explain the problem and situation and how he might improve it.

He asked the pilot how he thought he might fly less noisily. The pilot said, "Well maybe I can throttle back or take off at a steeper rate and throttle back after I get up there." So Chuck said, "Let's try it."

So the pilot and he went out and he improved his impact on the order of 10 to 15 decibels -- one airplane, one pilot, one effort. That is a significant improvement I would say.

The final variable that we must consider is the type of aircraft. For example, the Cessna Skymaster is a two-engine aircraft; one engine is in the front and one is in the rear. The propeller in the back tends to be a noise-maker because of the disturbed air as it flows over the fuselage or the nacelle, and therefore it is more noisy. I personally live in the flight pattern for Hawthorne Airport. The Northrop Corporation which builds its F-5's and F-18's there uses an aircraft called the Piaccia for transporting their personnel. It is a noisy aircraft. It has two pusher engines and props and besides that they dump the exhaust right into the prop and it chops up in the prop so it is noisy.

Some aircraft types are more noisy than others. We have tried to stay away from saying that certain aircraft may not use this airport; maybe some day we will come to that but I hope not because the big variable, as I mentioned is the pilot.

About a week ago or so I decided to test this system myself in flying myself into Torrance Airport. So I called the airport noise center and said I would like to fly into Torrance; I would like to take two or three touch-and-goes and have you monitor my aircraft and tell me how I did. So they said okay.

So, I was not taking off from Torrance, I was going from Hawthorne, not far away. "When you get airborne in our vicinity, call us on 122.9, our frequency, and let us know you are coming and we will monitor it." So I did that and I called on 1.229, identified the aircraft. They said, "What kind of an aircraft?"

And I said it was a Cessna 172 Skyhawk, green and white, and I gave him the regulation numbers. I said, "Now I am transferring to the tower frequency."

They said, "We will monitor you." So I did. I made three touch-and-go landings. The first one, I used the standard pattern, standard landing and standard takeoff. The second landing, I used a steep descent and a steep takeoff and in the third landing I used a low, slow drag-in type of descent and a steep takeoff, best rate of climb. Then after that I landed and I went into the office, said, "How did I do?"

Chuck said, "Ted, you are flying like a church mouse. You ranked between 62 and 64 decibels on your flying."

Well, it was a pretty standard day and I was alone in the aircraft so it was light and I did take off steeply on those two that I mentioned -- and I think therein lies a message that we should get to the pilot.

I do not think I am being unfaithful or disloyal to pilots when I say we can learn to fly less noisily and to take off with a rather steep rate of climb while you are still over the airport. It is the noise impacting on the area where it does not matter. People who work around airports do not mind the noise so much. What is noise to one person is music to another.

So after you climb up at a rather steep rate of climb to get off the airport boundary, then you can get to a cruise configuration and change your throttle setting or change your prop setting and therefore reduce the noise.

At Torrance they have made up a little flyer which fits into your Jeppeson manual and which has been mailed to every pilot in the western United States and it describes the best takeoff and landing configuration; climb as rapidly as possible to save maneuvering a lot and then go to cruise climb power and configuration to climb cruise.

The microphone that monitored my performance and all the other performances, the main one, monitor No. 1 is located 3,400 feet from the end of Runway 29 Right. It is out in the residential community. An interesting thing about this, Torrance Airport, just before you reach that community,

is Hawthorne Boulevard and it is a commercial street with a lot of stores and businesses and so on. So, the ideal takeoff from Torrance Airport would be to take off, climb steeply to Hawthorne Boulevard -- where you ought to have at least 600 feet of altitude at that point -- make a normal right-hand thirty-five degree turn and continue to climb out over Hawthorne Boulevard, continuing to climb where the noise is impacting down on businesses, industries, but not on homes.

Well, some pilots say, "You are not going to tell me how to do that. I will fly the way I feel is safe and right for my airplane according to the conditions." But if the pilots will do this, it will impact much less upon the community.

What about operators' controls, the control tower as it relates to the pilot? I have found the FAA reticent on enforcing local ordinances. They simply do not want to be involved in that, although I have heard the tower say, for example: For noise abatement, no turns until the coastline -- which is a couple of miles off the end of the runway at Torrance. I personally feel that the tower could mention local ordinances and penalties for violating such ordinances and I, as a pilot, would not be offended by their so doing.

There are a lot of transient pilots at Torrance and where they have a noise situation I think this would help. Pilots are generally willing to cooperate if they know what is required of them.

Recently, the chief of Torrance tower wrote a letter and I would like to quote just briefly from that, in which he talks about this particular issue. This is from Richard Cox and he says:

"The central issue concerning controllers and noise abatement is the methodology controllers employ to communicate local airport use restrictions. Remember, the controller's primary duty is to promote a safe, orderly, and expeditious flow of traffic. Yet because of FAA's concern for noise abatement, controllers are allowed to issue noise abatement advisories and communicate airport restrictions as other duties permit. Specifically, how does this noise abatement communication by the controller work? Assuming airport use restrictions are being employed, a controller responding to a pilot's request to make a touch-and-go landing, will state: For noise abatement request a full stop landing. Controllers will make this transmission provided other duties permit. If the pilot elects to make the touch-and-go landing anyway, despite the controller's noise abatement advisory, then the controller must issue the touch-and-go clearance, knowing well that the controllers are expressly prohibited from enforcing local airport use restrictions. This is FAA policy."

"In summary, The FAA uses many techniques to encourage pilot acceptance of noise abatement procedures but the controller may only issue advisories as other duties permit. Controllers cannot take any action which infers enforcement of airport use restrictions."

Now, that is from the Chief of the Torrance tower. Maybe as time goes on the FAA, in reviewing their policies, will be more willing to advise

pilots, especially about if you do this, here is the penalty. I think that will help get the message across.

What is the solution about all this for new airports? Well, you have been talking about this all week. I have heard from greater experts than I. I certainly think for anyone who is planning a new airport they are well advised to build a buffer zone of industries and commerce around that airport, not homes. And last of all, to advise and educate the pilots on how to fly quietly. I thank you.

DR. BRAGDON: Thank you, Ted, for those comments.

At this time I am pleased to introduce our panelists. The gentleman who is closest to my left is affiliated with the real estate program, College of Business at Georgia State University, Dr. Jim Vernor.

Next to that gentleman is somebody who is affiliated with the real estate industry. I want to indicate that we were able to get the participation of Lyndall Hughes, who is President of the Real Estate Aviation Chapter for the National Association of Realtors.

Immediately to Mr. Hughes's left is Terry Love, who is a professor in the College of Architecture at Georgia Tech and has had considerable interest and experience in the area of economic marketing analysis.

Immediately to his left is the last gentleman in our group, Julian Diaz. His firm is the International Appraisal and Research Group, Incorporated. He and his father have done considerable work in this area of real estate appraisal and its relationship to aircraft noise and have made this one of their specialties.

At this time I would like to have each panelist, beginning with Jim Vernor, present their opening remarks. After that we will open it up for questions from the floor.

DR. JAMES D. VERNOR: Thank you Cliff. Before I got into university teaching, I worked as a mortgage lender at a savings and loan association and as a real estate broker. I think of myself as an urban land economist doing applied research.

We are concerned with where our land uses locate and I think I see the problem here as one of profits and losses in the use of land around airports. Jim Scott told us about the profit opportunities in compatible uses immediately adjacent to the airport. A problem that we should go on and look at then is the least compatible, least profitable uses at some greater distance, especially real estate uses.

As a private sector operator, I see several problems involved in the airport area market. As a realtor, I am concerned that a customer who buys

property from me might come back dissatisfied later and claim perhaps misrepresentation or concealment. I would like to furnish him with information so that he understands the situation he is getting into. As an appraiser, I have a hard time gathering data to understand what is happening in the market, what sales are occurring, and just exactly how the proximity of the airport and the noise impacts on the usability and the value of that land.

Before I came over here we did some checking in our university library to see what has been written and published in the area of airport noise and there is very little. Very little information exists for most appraisers and the professional audience to access. Perhaps the specialists like Mr. Diaz and Jim Scott have more elaborate information plants, as we call them, but for most of the operators the information is very sketchy.

As a mortgage lender I am concerned about lending in the airport proximity because of the risk of future land values and I think I would be inclined to be much more conservative. Whereas I might make a seventy-five or eighty percent loan on certain kinds of commercial facilities elsewhere in the city, in the airport region I might make it only sixty percent. So I am going to control myself in that way and, of course, there are obvious risks to the owners.

But I do think Jim Scott's comment was really on target. We have a modified caveat emptor system; profits and losses in land use and development are part of the equity of ownership of land and I think we need to keep that in mind.

I would like to undertake programs to deal with the problem of airport noise that really addresses imperfections in the market, such as lack of information, primarily, and try to make the operations allocate land to its highest and best use. Now, again, that is background. I wanted to comment on two or three of Dr. Clifford Bragdon's suggested ways for dealing with the problem on page four in the binder.

I do not consider these necessarily advocated, but he listed them as possibilities. One was tax incentive for the installation of sound attenuation insulation. It seems to me that as the market allocates land to its users and users to the sites, the prices on the property nearest the airport that are adversely impacted fail to reflect that. I think that informed buyers get somewhat of a bargain price on property they buy in order to offset the damage that they will suffer.

I am talking about economic damage. I do not know how they address harm to health and happiness. I am talking about things we can quantify monetarily. It seems to me if the house is bought at a bargain price and then given a tax abatement as an inducement to insulate it, the properties become less vulnerable to the negative influence and they will probably rise in value. What we have is a transfer of wealth from the public, who bear the cost of tax abatement, to the land owners who can then sell those properties at closer to their otherwise normal value. So I do not find that an especially attractive possibility.

A second suggestion, not necessarily in order, was a fair disclosure requirement. This does appeal to me. I am eager to see the market work and that entails the providing of information to the participants in the market. I think that if left to their own devices, entrepreneurs can do a fairly good job of making the profitable land use work. What we need to do is to help safeguard the unformed, the unsophisticated, the unsuspecting, the ignorant buyer. I think an information requirement would be appropriate for them.

There is precedent for it. We have a requirement now that settlement costs be disclosed to buyers and they have to sign off, indicating they received this information. I do not think it would be difficult to move in that direction, to establish an airport noise zone and assure that either realtors or lenders inform the prospective buyers of this difficulty.

Dr. Bragdon suggested that this would indicate local legislation. I think there is precedent for Federal legislation. As it is now, we have flood-plain zoning and any lender with a Federal connection has to assure that there is appropriate flood insurance if the property is located in that area. This is enforced at the Federal level. It is a requirement imposed on lenders who are chartered by the Federal Government to sell loans to the Federal Government, whose loans are insured by the Federal Government through the FDIC or Federal Savings and Loan Insurance Corporation. That takes in probably ninety-six percent of most home loans made today.

So I think that would be a highly feasible possibility. I do not think as a lender I would like to put restrictions on private mortgage loans. I think that runs the risk of interfering with the entrepreneur's ability to recognize the highest and best use -- period.

Lastly, I did not hear very much discussion of the use of LD1's. Maybe this is too futuristic an idea. It appeals to me. I would think that perhaps tax increment bonds could be sold to raise money by a community to finance a land planning operation, land banking operation, and this in connection with transferable development rights which would remove development potential from the land a little farther away from the airport that does not offer the potential to be transferred to the sites closer in that do.

Finally, I think there is substantial sentiment for private land owners absorbing this kind of risk too late to check the citation. One of my colleagues told me about a case in California where a jury denied damage to a homeowner for damages caused by airport noise and told him that is part of the privileges and risk of home ownership. They did not feel the public sector should absorb that for him through the assessment of charges upon the airport.

MR. LYNDALL HUGHES: Good morning. I certainly enjoy being here. I wondered when I was called what I could offer to this conference and after being here three days I think I have found something. I know that the tenor of the meeting is all about major airports and there are an awful lot of little airports out there. I operate my airplane from a 2,000-foot landing field. Until just recently I lived in the flight plan. I was approximately 3,000 feet away from the field and the field has, as I said, 2,000 feet at the

end of the runway. There is about a 200-foot area of grass and power lines and a road. On the opposite side of the road is a housing development.

Now, when you take off with airplanes towards those houses -- and fifty percent of the flights are in that direction -- by the time you reach the power lines you are just clearing them and as you go over the houses you are perhaps at 100, 150 feet.

Now, I have lived there for ten years. The houses that are in the area -- I come from a transient community called Chagrin Falls, Ohio. It is a bedroom community for Cleveland. The turnover of the real estate is approximately every three years, so we have a bedroom community with young executives on the way up. They are constantly moving. All of these houses have changed hands many, many times.

Now, in ten years I have never heard one complaint from any of the residents that purchased houses in these areas. As a matter of fact, I am sure you all know that airplanes have a distinct sound. I fly a twin-engine Piper Aztec and with the field being so small, my plane was the largest on the field. When I would leave at unreasonable hours, the next day or a couple of days after I got back people would ask me where I was going because they knew it was my airplane. If I would come home in the middle of the night they would say, "Where were you? We heard you come in."

They never complained and I never thought about it until I came to this meeting. They just adjusted to the fact that it was happening and I think I understand why now. The frequency was not very great. The airport that I am talking about, when the GI bill was running strong was a flight training school and a primary flight training school in the Cleveland area. There were times when you would have four, five, six Cubs and then it turned into Cessna 150's and Piper Cherokees and they were constantly running, but there were not any complaints.

Now I believe that the information you have compiled is fantastic and it really was brought to my attention before but I think that this record should show that there are many, many airports out there which really do not have noise problems because these people who are living around this area know me. I have a pretty prominent spot in the community and if they were going to complain they would let me have it. I know that.

I think I get as much noise, as much of a noise probably from the motorcycles that run down my street because I live about a hundred feet back from the road -- or from the hotrods. The strip I live on is a little bit barren so they decide to rev it up a little as they are going down that strip but I just kind of accept that because it does not happen all the time. It is just an occurrence that is very slight.

Now I am in the real estate business, as you know. I am a developer, a syndicator. I have dabbled in the promotion of oil wells in my area and I have done a lot of things, but I was kind of disturbed to hear people come out and say developers are bad guys because I don't consider myself a bad guy.

I think developers are good guys. We make things happen. As far as the planning is concerned, most of my experience with planners has been that in many cases they have nice plans but they never contact the real estate people, as was mentioned before. Try as I will -- many, many times I have tried to get on the local zoning board but that is almost an impossible task for a real estate man in the so-called suburban communities.

The powers that be, that get elected, seem to think that a real estate man is trying to cut something for himself. They tend to ignore us, to the detriment of themselves in my opinion because we have a lot to give. They make stupid mistakes and I am not speaking of the planners, but I am speaking of the local government bodies, because they start to produce plans which they think are great but which are uneconomical. Most of the plans that I have seen came about in this manner:

The regional planning commission would start and they would bring this plan out to the local community and the local community will say, "We don't like this. We don't want the commercial. We don't want the industrial. We want a park here. We want this here."

So, it is sent back to the regional planning commission and after two or three trips like that the planning commission gets tired and puts down exactly what the local officials want and they call this a regional plan. Frankly, I do not think that is planning at all. I think the plans come about in the majority of the small communities, suburban areas, by the loud vocal voice of the complainers who always think that any change of zoning is going to affect the value of their house.

My group is a very specialized group of realtors. We right now are composed of about 250. We are a division of the Farmland Institute, which is also an arm of the National Association of Realtors. The Farmland Institute has 6,000 members and is a very, very active group which is primarily oriented to development of land. They would be a tremendous group that you could call upon and I would be glad to furnish a list of our members to anyone here who is directly involved in real estate aviation.

We have some members right now who are producing industrial parks with a landing strip attached. They are creating the whole thing. We have members who are producing residential developments with landing strips as part of the development and I, frankly, am at the very moment personally involved in an industrial development, a 100-acre industrial park. It is not too big and I am trying to get the adjoining property owners to give me a little piece of their land to make a condominium landing strip along the edge of this industrial area.

Now, the area that I am talking about is an area of about 1,000 acres of which my 100 will be a part, and operating with a hundred acres you do not have enough space to put your own landing strip in. I came up with the idea of having each of the owners of the adjoining parcels give me a small portion to condominiumize that into a landing strip for the benefit of all those who contributed. I do not know whether it is going to work out. I have been going

on it now for about a week. The response has been positive but I cannot give you the answer yet.

Another thing that bothers me is the closing of small airports. Since I have been flying, which is since 1960, I have seen in my area alone five airports close, gobbled up by land development -- and even with that experience my eyes were shut. I was off doing something else in a crowd because the landing field that is 3,000 feet from my house was just gobbled up by one of my competitors for that very purpose.

However, as a backup for that, Governor Rhodes' good old airport development program has been able to take up some of the slack from the closing of these airports and I was able to get -- after listening here Monday -- I was able to get some information on this which I have given to Dr. Bragon who will see that it is produced. So that you will have that information, because it is a very, very great development program.

And as to the closing of these small privately-owned airports -- those are the ones that are closed -- I think it is a tragedy and I really would recommend to any of those people here who have the ability to do so, to go back to their areas and see what they can do about stimulating airport development on a county-wide basis or any basis that you could see fit, because I see real trouble with the lack of airports in the future.

One airport in particular in our area was gobbled up by a land developer -- but I would call him a good guy -- and he kept a runway and he put his houses around it so the people that are coming in to buy these houses have direct access from their back yards to the landing strip.

EPA is here and everybody knows that EPA wants to put sewers everywhere. They want to sewer the United States -- and I can accept that. I have to. But I was completely surprised when I went to EPA with my new industrial park to find out that they were telling me that I could not put a sewer plant in. They would not accept that. The only thing they will accept on this piece of property is septic tanks.

So, there are two sides to everything and there is constant change.

MR. TERRENCE LOVE: In business school they teach you that nobody makes any money until somebody sells something and whether we like it or not we are all in the private sector because the private sector is basically where the selling happens. Our consulting firm has never really looked for consulting in the areas of airport noise. It is not an expertise that is thought or developed but it is certainly one you can back into in a hurry.

As a consultant in real estate development in my area, irrespective of scale, there are six places that I have had some experience, sometimes limited and sometimes extensive. I will try to vignette something out of each of those: Real estate appraisal; highest and best use analysis of land; submission of applications for project approval; study of airport attractiveness, what tenants might an airport bring around it; then a role as an architect and a role as a real estate broker.

Going back to the first one might be the safest place to be if you can find comparables within the same airport noise rating. We call them centers, CNR's, or the three zones, three as defined by HUD -- and I don't know how many other institutions will use the same zone letter -- where they can blow you away at the 75 decibel level measured, as Lyndall was saying, on frequency; does it achieve 75 decibels during an eight out of twenty-four-hour period.

A discretionary level we found with HUD, where it is normally unacceptable and you will have to write it is normally unacceptable and you will have to write an EIS that will have to be read in Washington -- you can imagine the amount of time that that would take -- in the 65 to 75 decibel level or CNR zone two, with the clear zone under that at 65 decibels. This would allow on a map an appraiser to say: Look, this homeowner suffered under the same zone or the same noise rating as the subject property did, therefore adjustments are not necessary between those comparables according to the standards used by, originated by, whatever, HUD.

In the highest and best use analysis the same kind of measures would be required, or would be certainly of interest to a client. The highest and best use, if an FHA requirement is to be met, you could change substantially what the use, what the density, what the architectural character might be of development within the zone of that subject property.

Third, in the submission or in application for project approval before a subdivision house, simple house is to be built in terms of new construction, many times formal approvals of the subdivision would be necessary. Fannie May, the Federal National Mortgage Association, is the biggest secondary lender along with Freddie Mac, the Federal Home Loan Mortgage Corporation.

For many years I thought these were the Fannie Mays out of the back of Penthouse Magazine. It was quite a disappointment to find out that these were not the young ladies who frolicked on those pages, but they were highly institutionalized lenders in the secondary market that you and I would not normally work with but who might purchase all of the mortgages out of Lyndall's subdivision or who might hold my personal house mortgage. The Veterans Administration I think would fall in a category like that, having its own standards but really is shaded toward the veteran borrower or the buyer and if the veteran wants to live in a high noise-rated area it is very likely that that mortgage can be guaranteed for him.

FHA falls within HUD but also HUD can hold some strings on sewer and water bonds, on other kinds of monies for apartment loans, for properties that come through HUD. And so property may carry with it a reject stamp requiring just a few hours of research, not an extensive highest investments, to qualify under HUD for a noise rating in an area like this.

The fourth place that we have been thrust has been in the study of land around airports as regards not the detriment but the attractiveness for sitting industrial parks, for office parks, other kinds of airport-related uses. We found in our area there to be a good deal less attractiveness for

office users who really put being near the airport next after whatever, whatever being perhaps is the site near where I work, is it near where my employment is, where my clients might be and being near the airport always falls in after other more normal real estate decisions, criteria. This could be true in airport industrial and in particular air freight where the inventory may only stay in that location, warehouse, what have you for a few hours.

If it was important that it be air-carried in the first place, then you do not leave it in a warehouse any longer than is absolutely necessary and so the same physical space handles far more inventory than any other kind of warehouse that you might think of.

The fifth role I have been in is an architectural role where a former architectural firm did the research campus for Lockheed and the research was highly scientific, meaning we are not just talking about people being annoyed by sound and, more likely, being annoyed by vibrations. But the campus was not located across town as far away from the airport as you can get, it was right on the same premises with Dobbins and the Lockheed base. Here, with sound attenuating architectural designs we had never done before, it took a great deal of research to find almost automobile-type gasketing around windows with a four-inch dead space required, so the windows did not stay fogged all the time, individual desiccate decanters at every window. But there are ways with architectural design to circumvent or master some of the problems that we were talking about that otherwise might be inherent in that dirt, in that land, in that real estate.

And the last role was a broker's role, where again you could look at the rent comparables around an apartment project that I am involved in now, where the other parameters in that immediate area suffer under the same sound problem; point to them as rent comparables and if there are detriments to the subject real estate then, of course, they have fallen on all the comparable real estate as well and you do not isolate your private sector "piece of the world" apart from that immediate environment.

You say, "Oh, this is terrible," but again, following Lyndall's remarks, there is a good deal of building up or developing callouses on your cardrum, I suppose, among those in many cases. Jim's remark about caveat emptor relates here -- You know the noise is there many times before the real estate is sold.

This issue is something I have not received yet but it was just published July 12th of this year, "Environment Criterion and Standards," from Federal Regulations. We will all need that in our work kits as we move on in the private sector relations and environmental impact statement ratings, what have you. These things can change after properties have been acquired.

MR. JULIAN DIAZ: The firm that I represent, International Appraisal and Research Group, has been involved with a lot of noise-type problems with the Atlanta airport for many, many years. Most recently and probably most visually, we have been involved in the Mountain View Project where a noise impacted area has been, or funds have been allocated to buy up residences in what was considered a noise-impacted area. We had the responsibility of

overseeing and reviewing all the appraisal work in that project and it is still going on today.

It is one of the pilot projects of that type in the country now, but my major concern about the noise issue and the airport noise issue is that I do not feel the definition of the problem has really been crystallized. I mean we all know that noise is the problem but I think to a higher extent that people's reaction to noise is the problem, how noise affects them, the problem from the medical point of view. We have got a lot of evidence but from a value point of view there is very, very little evidence on this.

I think the effect that noise has on value is a major concern of people and it is evidenced by the weight of all the lawsuits that we have right now; the dockets are just filled with them and my major concern is that the decision makers do not have the proper amount of data to make the intelligent policy decisions, to make intelligent regulations in the field of exactly what is the effect on values.

For this reason, my major interest has been the development of various methodologies that can be employed by appraisers and employed by statisticians and others who are in the field. These are methodologies that can be applied to measure what this effect is. I think that it is absolutely essential that this sort of data is made available to policymakers so that we can be sure that the proper goals and proper standards are designed and are implemented and also so that local authorities, in trying to meet the regulations, can know what procedures will maximize their efforts in getting these goals and these regulations.

The methodologies that basically we have come up with are pretty much a marriage of the input of the appraiser and the sophisticated statistical skills. Unfortunately, most of the studies I have looked at by appraisers in the past have shown a lack of use of these sophisticated statistical skills or on the other hand if they were done by statisticians they were shown to have a certain amount of naivete about how the real estate market reacts and what factors are value-oriented. So the methodologies have to be a sort of marriage of these two skills, and this is what we have tried to develop. So the methodologies that would be developed could be ones that would be applied.

The preliminary applications of the methodologies that we have come up with in the area have shown a certain amount of overreaction as far as development of policies go. For instance, off of one runway we were able to statistically determine that the no-effect zone on value -- in other words, where value was not depreciated as a result of the noise -- was the thirty NEF zone. We did our study in NEF's. I think that is approximately equal to 75 Ldn or something like that.

ATTENDEE: Sixty-five.

MR. DIAZ: No, I think -- Well, whatever. Anyway, it is substantially higher exposure than for instance the EPA has said it must be, the area where we must concentrate our efforts. I think their response has been 65 Ldn, as the zone where you cannot tell any difference between noise of

airports and noise of environments. But that is not the same thing as the point where people will tolerate noise or that there will be some sort of compensating factors for the benefit of being around the airport versus the problems of noise.

Now we have found out that there is definitely a zone for residential property where there is value but it is very important, we feel, that that zone is identified. So I think that it is very important that our methodologies be disseminated among appraisers and other value-oriented consultants so that the planners and the policy makers can have the data that they need to implement the policies and regulations that will not only be of service to the airport but also minimize the problem and will not over react from the taxpayers point of view.

DR. BRAGDON: At this time are there any questions directly from the floor concerning either the speakers or panelists?

MR. ROBERT CLARK: Bob Clark, Kinston, North Carolina. Richard Forbes, I believe he left the meeting, but he mentioned or somebody from the audience mentioned a fair disclosure earlier today and I would just like to mention to the audience that we have in North Carolina two, only two examples I know of where local governments have adopted fair disclosure ordinances. And I would like to report just quickly what the results of that have been.

In the last four years both of these ordinances were adopted as part of a development around Cherry Point, the Marine Corps air base which impacts Havelock and Craven County. Both of those communities have adopted fair disclosure ordinances. One is a issuance. In that part of the country in this particular location, much development occurs with septic tanks for single-family housing as well as for some commercial activities.

The other one from the City of Havelock was for a partial moratorium on utility blackouts but primarily was related to notification at deed transfer or at closing with the financial market. Both of those ordinances have had some impact, but primarily, after looking back over the last several years, not as much as we had expected originally.

First of all, most of the area is covered by at least 65 Ldn for most of the city and the effect has been that although there may be some measureable decrease in the rapidity of sales of properties for vacant lots for housing development, it has not really been apparent because they are still filling up in this area. The disclosure actually on the ordinance for the city, they almost come too late to the closing.

I have suggested to somebody down there that they start looking at the possibility of disclosing at an earlier time, perhaps at the contract or option state for development. One thing I would like to report and the national institutions, particularly the brokers though, are the best policers of the program and they also are advertising that their neighborhoods are quiet, their lots are not impacted by noise. This may or may not be so but that is what they are adverstising.

Moving on to another quick question I have for James Cott, I would like to mention that in the Kinston area we are still selling some property

near an airport for five cents a square foot, not \$5.00 a square foot. Specifically, this comes to a severe problem. In fact, when it comes down to the real nitty gritty of a zoning decision it is much easier for a zoning board to be persuaded or dissuaded from one classification to the next when there is a marketability for both types of uses.

You speak of the creative developer and the usefulness of this land but how can we? I do not think it is going to work very well in our situation at this time under these kinds of market conditions when giving utilities there to support both types of development to some extent. How do we inspire the nonresidential types of development in this area?

MR. SCOTT: The question is, how do you inspire the nonresidential developer to come in and take advantage --

MR. CLARK: And not necessarily through zoning, which is temporary in some cases.

MR. SCOTT: They will come in if it is attractive. They will come in if it is profit-making. The big problem -- and I had several questions after I spoke about zoning -- is how do you attract people. How do you keep the residences out? How do you keep commercial and industrial in?

On a small airport where the growth is not yet started, where there is not yet a lot of impetus behind it, you cannot do it or you are going to stifle the growth. I think you are better off with the zoning that is encompassing, one that allows all the classifications into it and tends to let it find its own level because you can destroy it if you are too restrictive.

I did work around one in upstate New York in which they had zoned a thousand acres for industrial and in the area that they zoned for industry around the airport they took in one of the best hunting and fishing areas around there. And it was so restrictive in zoning that they could no longer build fishing and land cultivation projects along the river.

MS. LISA H. WOGEN: My name is Lisa Wogen from National League of Cities. I want to assure Stan Green that we are trying to do something about the barking dogs we have. Maybe we could distribute a few thousand of them around the country for training jets. But I also wanted to concur. I think this has been really a valuable experience for all of us.

From my point of view I have learned a lot and I hope to be able to take it back and share it with my constituency of liberal elected officials. They are concerned. We just did a recent survey in which eighty percent of them responded that they did not think enough was being done about noise. I think part of their problem is they do not have answers. None of us have answers but coming to this one conference and hopefully future ones I think will be the means of giving people information.

The elected officials have to know what you are thinking and hopefully we will be able to get more of them together with you to give you their viewpoints and speak of the problems that they are having. Thank you.

DR. BRAGDON: Thank you for your comment.

MR. JOHN TYLER: John Tyler speaking. I would like to comment on the presentations of the first two speakers, our real estate expert and our appraiser expert.

During the last ten years in particular, big companies and big industries have been criticized for their lack of concern of the environmental impact of their activities on the country. We now find big industries like the oil industry, for example, with big TV programs. You will notice on the Shell Oil programs their support for various programs. They tell what they are doing to support environmental protection around the world.

I am a little concerned about the attitude which I have gotten from the presentations this morning as to bankers, for example, and mortgage money and developers and so on with regard to providing support for the development of residential units right in the middle of a place which has been identified as something which either is or will shortly be an area where the noise exposure would be way beyond what would be acceptable for residential use. I have gotten the impression here that the feeling is the buyer should beware.

Somebody mentioned this morning that the pilots in College Park bought property and then later found out the noise was way beyond what they expected and they were concerned. I would like to just describe a situation that occurred with regard to an SAE Committee which met in New York. And the secretary of the committee, a professional staff man, had a wife who wanted to buy a house farther out on the island.

Many of the committee members are here today and we know the story pretty well. The wife was told: You go out and find a house that you think you like and just make sure you go and see several times. Well, the wife picked out a piece of property which happened to be directly under the takeoff flight pattern from one of Kennedy's runways and visited it seven times and at no time during that period was there ever an airplane in sight in the sky.

This was contrived by the real estate agent who had a telephone number to the tower she could determine when the runway was in active use. If the runway was in use she was not available to show the property so that she really researched this thing very carefully. And her husband, knowing all of this, just collected this data for the information of we industry members who sort of dedicate our lives to do something to help this problem.

But here is a realtor who sort of undermines all of our activities, gets people to come in, sign on the dotted line, move in and the next day, boy, all hell breaks loose.

Now our professors on the panel this morning I note have considerable interest in this problem and I am pleased to see that they are interested in determining what the noise impact is in the areas where houses are being built. And earlier in this session material was presented which could be used as a rule of thumb to indicate what the noise impact would be, either today or with the operations which might exist ten years from now or twenty years from now, so that if you dig a little bit below the surface you can obtain this information.

My question is: How much interest do you suppose will be shown by the banking industry, for example, the real estate industry, the appraising industry in taking on the responsibility of making sure that the buyer is aware of what the problem will be so that it is not really false advertising or false presentations as is the case all over the country?

This problem has been discussed in Congress. They have considered the requirement of disclosure of noise impact on residential areas before houses are sold. It did not get through because the lobbyists from the real estate industry are too strong. But let us hear your reaction to that problem.

MR. HUGHES: Could I comment on that:

DR. BRAGDON: Surely.

MR. HUGHES: I am sorry you are talking about an experience with a so-called realtor, but the first thing I would like to point out is that realtor is not a generic term; it is a specific group of real estate brokers and I hope the real estate broker who did this to your friend was not a realtor.

Second, as far as disclosure is concerned let me say that the Securities and Exchange Commission is at the present breathing down the necks of all real estate brokers in the country. I believe that in the next four or five years all real estate brokers will be forced to have securities licenses. They have decided that in about eight-five to ninety percent of the cases the sales by real estate brokers constitute an investment contract, and if in fact that is the case and I believe it is, under the terms of the Securities and Exchange Commission, someone who is not informed of all the facts in a sale of a private, single-family residence could go back to the salesman or the broker that that salesman worked for and demand his money back.

Now this is rather a severe penalty and I do not believe that the realtors in general will try in any way, shape or form to hide the disclosure of printed facts such as flight patterns. It may be going on now but it may be to a certain degree done because they do not have the facts in front of them. I am sure it is in the case where you are talking about because it is very common knowledge. But in many instances in other communities the buyer on the ground really cannot tell where the airplane is.

He gets too mired up in twisted streets and connections from one street to another. They do not know where the airport is and they have no idea whether the runway is pointing in their direction.

I do feel a plan that could be sent out to the real estate board in the city, with the request that every one of the members receive a copy, would be very well received by the real estate community because although the average real estate broker does not know the facts that I have just told you -- because it has not been disseminated down to them -- it is a fact. I happen to be the state president also of the Real Estate Securities and Syndication Institute of Ohio, which is a division of the National Association of Realtors and it is a pretty involved thing and it is going to be quite a sweeping change, I believe, in the real estate business.

So, I think if the disclosure information is provided to the realtors they will be happy to disseminate it and they will do it up front because the major thing is to do it up front.

MR. TYLER: Let me tell you that the airport operator does not disclose this information. He keeps it close to his chest and if anybody has a set of contours or operations distributed he may well disallow any connection with that particular plan because the airport operator wants to protect his interests. So, it is not a matter of something being disseminated and the realtor using it. The question is: Is the realtor interested in looking into this on his own to protect the buyer? I would like to hear a response from our appraiser too.

MR. SCOTT: All right, if I may, you are asking the lending institutions to go back into something they were accused of and practically run out of business for or certainly badly ridiculed for. That is a type of red lining and they are sure as hell not going to be back into anything like that. They are not going to withhold loans from borrowers to which they can legitimately make loans in areas where people can legitimately make the request for such a loan.

There is another problem and this is a human factor. It is a very selfish and very egotistical thing built into people. I do not know why but you will find that many people will buy Consumers Digest for six months, do comparison shopping in everything else and ask everybody everything, all the experts they know, which is the best iron to buy or which is the best radio or oven or something like this or a TV but they are all experts and they know more about real estate than any real estate broker, lender or appraiser ever knew.

It is simple to hire a consultant and ask another broker or if they want to hire you on the basis of \$25.00 a day and expect you to give a \$100,000 job. That is true. But ask them to get this information, never. People have this built into them. This is their castle, you cannot take it away from them if they want this for their castle. They have a built-in idea to dislodge.

You have two factors -- you cannot impose these on - rather, I should say the lender cannot self-impose these on himself and the other thing is the people have this built into themselves. They know more about it than anyone else, especially on their own property.

MR. TYLER: Disclosing information with regard to noise impact in that area?

MR. SCOTT: You mean after they have agreed to buy a residence subject to a mortgage, the lender is supposed to say to them this is not a good place for you to invest your money because it is near the airport?

MR. TYLER: Yes.

MR. SCOTT: I see problems that just proliferate out of the ground but I do not think that lender would appreciate it or brokers of any type

would appreciate it if the man was reasonably apprised of the proximity of the airport.

MR. TYLER: You are sort of skirting the question.

MR. SCOTT: No, I don't think so.

MR. TYLER: The reason he should be apprised of the proximity of the airport -- Let us say if he is specifically informed with regard to the noise impact as compared to what is considered to be acceptable for residential use.

MR. SCOTT: If you do that you must have, as Julian so well described and others have, you must have a highly sophisticated noise level plan that reflects exactly what happens at the airport. That must be available to everyone and it could be available in welcome kits, from realtors, chambers of commerce. This is the only thing you can do because I can see so many problems of someone saying you are within a half mile of the airport, you should not buy.

Julian has just finished a study tht says it is an area of inconsequence, it makes no effect to value.

MR. TYLER: Maybe what we should be talking about is an additional asset, just a simple little thing an Ldn value at that location.

MR. HUGHES: Let me say that you are talking over the head of the average real estate person when you talk in terms of numbers and symbols. I did not know what you were talking about when I got here. Even now I have a vague idea that the bigger the number the worse it is.

DR. BRAGDON: What we are showing here is the need of greater communication, which is the benefit of what we are doing and hopefully will extend. One quick example of the need for cooperation, a fair disclosure ordinance that was developed for the City of Virginia Beach which goes back a couple of years. It was passed by the city planning commission, passed by the city council. The next day it was defeated, it was repealed by the real estate board who felt this was not the type of information that would enhance the City of Virginia Beach.

The point is, there is some dialogue that does suggest that certain real estate interests may not feel that this information is going to be useful or would be educative for all groups. I mean, that is the other side of the issue. I just wanted to mention that.

MR. LEWIS: Joe Lewis, Town of Hempstead. May I just add to this? We are really off the track when we talk about the disclosure. The fact that an area is an NEF 30, 40, 60 Ldn and if it is mentioned means nothing. I have this every week. I get two or three questions on what John was talking about. If somebody comes out to look at a house when they are using a particular runway at let's say 11:00 o'clock in the morning, there may be an airplane coming over every five, seven, eight or ten minutes and they say, "Well, I can live with this." Let them come out between 4:00 in the afternoon and 11:00 that night and you have got an airplane coming over -- and I am talking about big jets now -- they are coming over every sixty, seventy,

eighty or ninety seconds. That is a whole different ball game.

So when you are talking about disclosures, you have got to be careful of what you put in there. If you just say it is under a flight pattern, it means nothing, absolutely nothing, and I think that this is something that everybody has to think about. And for Jim, this is in line with what you said about when people buy homes under a flight pattern and then they complain because many times -- and I have three or four requests a week from real estate people, from private individuals selling their homes asking is it all right to have somebody come out to the house at 2:00 o'clock to look at it -- what runway are they using?

You see, this is all part of the whole thing and I think I have an answer to the land use around airports. Sell it only to pilots to live there.

MS. LUCIE SEARLE: My name is Lucie Searle from Massachusetts. I do not want to belabor this but I think there is a distinction here between the actual fair disclosure statement, which is a very legal kind of element, and the role that I think in Massachusetts we would like to see real estate people play.

This is simply to let someone know that there is an airport nearby when you are showing homes, and the point I want to make is there are a lot of people that do not regard an airport as a neighbor they do not want. There are people who want to live near an airport. They would like to. They are pilots and they are people who have a plane they would like to keep nearby. An airport is an attractive thing to some people, some homeowners.

The point is to let them know, make sure they know that is what they are getting into. Now, as you know, in Massachusetts we have the state agencies now and what we have done is on those airports that I have some hard data about noise contours, I have written to realtors and particularly one I can remember -- this was a Century 21 -- either wrote or called up and they said we would like to know about our airport, which was exactly what I wanted to hear. It was a perfect opportunity.

I sent them all the information that we had and said here is the airport manager's number, call him, take the people over, show them the airport, make sure they know how close it is, et cetera, et cetera.

Just to summarize: Yes, there are some people who do want to live near airports and I do not think brokers are all bad at all. I think there is a role there to play and I think we need to help them because it is extremely technical and maybe this is something not for an airport operator but a state agency.

I have a question now on fair disclosure statements. I can understand how it might be easy to get something like this in the case of a new home probably requiring it. What I have all the more trouble with is an existing house that has been around for a number of years and someone owns it who wants to sell it. Where do you break in on that vicious circle?

Now, does that usually require some sort of state legislation? Because I suspect the homeowner is going to argue that there is a good chance that he is not going to be able to sell his house for as much and he should not have to pay the penalty for that. So is that something that usually takes some state legislation?

DR. BRAGDON: Is there comment from the panel here?

MR. HUGHES: The only thing I can say is, in our area if we had such a paper like that recorded at the courthouse which showed an area of noise intensity and some description of what it meant in words, I would think that all the title companies -- this is, of course, without mentioning it to the realtors -- all the title companies would actually pick this up upon examination of the title and it would be part of the title paper.

I would also suggest that if you are going to do that, you do what I said and get the information to the real estate boards, because I really feel they have a definite interest in their own behalf to do that, to disclose that information. I do not mean a legal disclosure. I mean full disclosure.

MR. LOVE: We have found it to be in operation that if a formal approval of a subdivision is necessary, such as HUD approval, like the acreage level, which I think is a very proper one, we found these contour maps hard to get, almost impossible to get. I called the environmental officer at the Georgia Area HUD Office and, if I called him with any frequency he would cut me off, and I would have no supply there. So disclosure begins with availability, I believe.

In the defense of the lenders, lenders are probably more concerned about the new laws in equal opportunity in lending. They are probably more concerned about the borrower having some recourse against them for denying the loan than they are about that borrower having any recourse against them about making the loan in a noise level. The little study from which this map was taken was a multimillion dollar acreage parcel intended for high density -- well, mild and moderate density residential development, a thousand units or something like that. I doubt that the sophisticated developer who bought it ever gave a thought to the fact that he actually was in a discretionary disclosure normally unacceptable level and plunked down a million dollars or whatever and his lender who plunked down several million after that.

MR. JOHN SCHETTINO: John Schettino, EPA noise office. I wanted to comment about some remarks.

First, Mr. Hughes, I can assure you that the Office of Noise Abatement and Control does have an interest in sewers, septic tanks, garbage disposals. As a matter of fact, I suspect that a regulation on compactors has been issued now since I came down here on Monday, but beyond that we have regulated several pieces of construction equipment and so we hope you see those on your sites.

Concerning Mr. Diaz' comment, I believe you misstated EPA's position vis-a-vis Ldn 65. EPA has never said that Ldn 65 was acceptable in any

circumstance. The document in which we expressed what national goals or national strategy should be indicated an agenda that said we should do everything possible immediately to remove people or to improve the exposure for those people that were presently exposed to Ldn 75 or greater.

The second statement in that document says that we should then proceed to take the steps and to do the things necessary to improve exposure to Ldn 65.

The final statement that we make in that agenda is that for any new activities and for long-range planning, Ldn 55 or lower should be the objective and that was to be accomplished by bringing all of the people that are affected by noise together to see that that was achieved.

Now, when we talked specifically about aviation, I think that many of us here who have been dealing with the carrier-type airports, large commercial carrier airports and for which I think we have a better feel for the nature and extent of their problem, I think that most of us have concluded that it is going to be a monumental task to even improve the situation for those people who are presently exposed to Ldn 75 and greater in the remaining years of this decade.

The question that we have is whether we do things now to solve that problem that might circumvent lower levels sometime in the future, that is below Ldn 75. I do not believe there is anyone in this audience that can accurately represent or present to you on a national basis what the general aviation situation is, and I don't even know whether it is possible to collapse the general aviation situation such that you can look at it broadly on a national basis. I would conclude from what I have heard over the last three or four days that the range or spectrum of noise levels that pertain around general aviation airports varies anywhere from Ldn 45 up to perhaps Ldn 65 or 70, and to my mind that is a monumental task to try to develop some national strategy -- and that is primarily what EPA attempts to do.

If there is a possibility of a national strategy to be developed that can be effected by the Federal Government, then that is where they will put their resources on a priority basis. But if that task looks like it is more amenable to be solved by the people on the local level, by the people sitting in this audience, then we would prefer that that is where it comes from, without Federal involvement. And perhaps our role is to bring these people together more often in a nonhostile, nonadversarial situation which always pertains when the Federal Government gets directly involved in regulations.

This audience would separate out into about four or five groups that would no longer be talking to each other but would be contacting me, sitting up there trying to defend what I was trying to do to satisfy all of their interests and we do not like that role if we can avoid it.

And so my final comment, as far as what I have heard about the real estate or realtors or real estate developers and the lending institutions, I don't believe that I have really gotten a good feel for how those elements get involved or participate in solving some of these problems. I think that, with only very rare exceptions, most of the aviation noise problem has resulted

from encroachment. I am old enough to know and remember that you had to drive for at least an hour in order to show your son what a real airplane looked like and not that model that you carved out of balsa wood for him -- and I did that many times.

I can go back to a number of those airports now as an older and wiser man and find not the pastures, not the dumps, not the swamps, but residences and blocks and tracts of residences. So there was encroachment. That encroachment came about because a developer built there and people bought those homes and that problem still continues.

Pertaining to the real estate developers and/or banking interests, what obligations do they have to participate directly in a land use planning and zoning process to insure environmental protection? If they have any obligations, how are they discharged? Do national organizations get involved or just local interests?

Finally, if the answer to my first question is no, but we here believe that they do have a role and should participate, what can we do to get them involved? I think that ought to be a closing note. I was not really asking for any comments at this point on that.

AFTERNOON SESSION

October 5, 1979

2:10 o'clock, p.m.

DR. BRAGDON: This afternoon we are moving into the experiences of the air carrier airports, to describe those experiences and how those efforts can assist general aviation. It is always fortunate to have some historical perspective; unfortunately, many times you learn at the expense of their experience, but G.A. has the opportunity of learning from significant efforts made by several major airports throughout the United States.

We have a very distinguished group of panelists as well as speakers this afternoon and they are going to relate those experiences to you. The first of them is Walter V. Collins. Walter Collins is with the Los Angeles International Airport, referred to as LAX. He is in charge of noise abatement for that airport and he is going to relate to us the experiences of noise abatement efforts around the Los Angeles area.

MR. WALTER V. COLLINS: Good afternoon! I am pleased to be here and I will be glad also to catch the airplane fortunately if I leave on time this afternoon. That is, what I am going to give you is the history, and "oi vay," the history!

I guess we are probably notorious for this problem that you people have discussed for most of the week. I will be as brief as I can, hit the highlights and hopefully by 4:00 o'clock you may have some specific questions that perhaps I could give you a more pointed answer to.

First of all, the statement of the problem of the impact of general aviation noise upon airport communities has been a growing problem during the past two decades and will continue to be a problem during the foreseeable future. The problem developed due to the commensurate growth of airport communities with air transportation. Since the advent of the air carrier jet aircraft at Los Angeles International Airport in 1959, the City of Los Angeles Department of Airports has aggressively sought methods to reduce the impact of aircraft operations on surrounding communities in addition to supporting local, State, and Federal efforts to enact noise abatement legislation.

In keeping with this position, the department, in conjunction with the City of Los Angeles Planning Department and other interested groups, formulated a LAX airport development plan which is highly sensitive to the continuing integrity of the neighboring communities. For some time the department has encouraged public participation and input concerning airport expansion and major facility improvements. Most of the input is obtained through the environmental process and public hearings; however, the department has established a Citizens Airport Advisory Committee that meets on a regular basis.

This committee is comprised of representative members from surrounding communities and provides much needed communication on airport problems especially noise. At this time, I would like to mention some of the programs at our airport, the FAA and the airlines in general have conducted to acquaint you with our efforts to minimize our noise problem.

Number one, we modified the traffic patterns that insure the highest aircraft altitude while flying over populated areas. Now, on that point, when I first came into noise abatement there was a FAR, which still exists today and which says the minimum altitude around an airport is 1,500 feet around an air carrier facility. It was a big deal back in 1968 when the FAA considered raising it 500 to 2,000 feet minimum. That was two thousand, and now they have raised it to where it is at 5,000 or at least 5,000 or above when adjacent to downwind north of our airport.

(Slide). Now I realize that this color and this chart is not adequate for this large of an auditorium and distance, but we have two runways in the north, and two south runways running parallel to each other, both complexes. We have on this chart, the ocean, Inglewood, Los Angeles, and the City of El Segundo. Here is the airport for the City of Hawthorne and its single runway, a general aviation airport.

We have Hughes Airport and Santa Monica above this. Now they are above 5,000 turning outside of Hollywood Park Racetrack, and making their entry into their final approach to both complexes. Of course, we raised the ILS glide slope from 2.75 to 3 degrees back in 1962.

We developed a suppressor shield for night maintenance, which is another area of concern, and spent \$200 thousand for that, and identified a large piece of property and built the suppressor with minimum costs. As a matter of fact, the architect drew the plans for nothing. However, extensive tests proved that it was not workable for the needs of the airlines.

Of course, the tests imposed upon that structure were at high power, with four engines in a 707 and it choked itself to death with the ingestion of the exhaust gases, so as a consequence we built another one that is even more effective.

We banned maintenance between 11:00 p.m. and 6:00 a.m. in the morning, except for a single engine at any site may be turned up not exceeding idle power so they could accomplish leak checks, in a sense, for any auxiliary units that they may have, or changing of piping or hosing, and they could at least make a security or a leak check.

But there are no power turnups where they used to run triple checks at 3:00 o'clock in the morning.

We conducted residential and school sound-proofing pilot studies at a cost of a half million dollars. They have been best sellers, I think, over the years, and our sound-proofing became somewhat of a textbook in a way, in that the FAA has published it for information for communities that may be considering such action.

Five, we have modified departure tracks to remain over water as long as possible, and to insure recrossing coastal areas at high altitude. In the past, many years back until we changed the first route on departure, the nighttime operations -- night departure tracks -- were the same as during the daytime. The FAA did not feel it was compatible with their needs and safety to adjust those tracks even though the traffic was minimized.

However, with some inducement, cajoling, and the pressures getting greater, they considered commencing at 8:30 until around 6:30 in the morning; all departures would fly on continuous climb over the Seal Beach area and then go on to their destinations to the south and northeast, and due east of the airport. Prior to that, and subsequently during the following years during the daytime, the tracks were maintained on takeoff to fly over the Pacific Palisades-Beverly Hills area with a constrained altitude of 5,000 feet to provide for the arriving aircraft, so that there would not be any conflict with their letdown.

Also that departures going to the east during the daytime overflew Palos Verdes and Manhattan Beach, Redondo Beach, but now they do not cross either the northern area or the southern area 24-hours a day; they all go to the south over Seal Beach for those that are going in those southerly directions. As well as to the northeast, at the choice of the airlines, the ones that used to go to the north or Daggett, which is an intersection that they proceed on to the northeast as well, they do what we call the Daggett loop in that they take off from the North runway and do like a ninety-two seventy and come out and cross over the coast not less than 10,000 feet.

Now the 747's cannot be routed that way, but all other aircraft can. So the contribution of changes in tracks is enormous in that our source of complaints were as far as Pacific Palisades all the way down to Palos Verdes, well to the south.

So at a busy airport you can change tracks. That is a contribution that can be made at most every airport. In most instances it can be done and the only one that can do it is the Federal Aviation Administration. In addition, the Department of Airports has encouraged doing everything economically feasible consistent with safety to reduce noise within the limits of available technology. With the support of the FAA an over-ocean program has been in use for some time, which I just explained to you. We also have, and probably the first, over-ocean approaches at night. These what is called over-ocean approaches occur between midnight and 6:30 in the morning where, during good visibility, we have simultaneous takeoffs and landings with a middle separation. This is approximately a mile between the complexes.

We use the input runways as preferential runways for takeoff to lessen the noise impact on the side; and when they takeoff they are routed, as I have described previously to you, between the midnight and 6:00 o'clock period and all approaches check over Santa Monica, VFR, turn in, and land on Runway 6-Right or 7-Left, the inboard runways.

Under instrument conditions, however, the FAA employs a system known as "metering" where, depending upon the numbers landing and taking off there are say, for instance as an example, thirty minutes of takeoff, thirty minutes of landing, but there is no counter traffic during low visibility or during instrument periods.

Land acquisition is also considered a means of mitigating noise. The department has acquired over 640 acres of impacted property at a cost of one hundred forty-four, including \$7 million beyond of ADAP funds which come to

our rescue. Although land acquisition is costly, it is effective for communities located in areas of high noise impact because it is a permanent solution and offers the possibility of a return on the investment since the acquired land can ultimately be placed into compatible and productive use:

When the negotiations are concluded to purchase a home, the resident is paid in addition to a fair market value for their property:

1. Relocation advice and assistance.
2. Actual moving expenses within an area not to exceed fifty miles, and if beyond this area moving expenses not to exceed \$500.
3. Replacement housing supplement not to exceed \$15,000.
4. Interest equalization benefit which is to provide the additional costs of the loan between the old mortgage interest and the new mortgage interest of their replacement home. This is not to exceed \$15,000.
5. Rental supplement payment -- in the case of a renter of a house that has been purchased by the Department of Airports, this supplement is given to the renter should he rent another residence or apartment, or it may be used by the renter for a down payment on a house should he decide to purchase. I think in all that is not to exceed \$4,000.

I think in all that is a fair way of dealing with the public. The owner of the property does not pay title fees, escrow fees, prepayment penalties on the existing loan, or brokerage fee.

The department has also acquired avigational easements and experimented with soundproofing as potential mitigation measures. Avigational easements are an effective tool to protect the airport operator in that the purchase of an easement removes the airport operator from liability for inverse condemnation.

And in the department's experimental soundproofing program a variety of homes within the impact area were insulated to various degrees. As a result of the study, it was determined that soundproofing is not cost effective in high noise impact areas because in Southern California most people do a great deal of outdoor living. However, in areas less impacted by noise, soundproofing -- including air conditioning -- may be a valuable method of mitigating noise impact.

California has established a phased schedule of airport noise reduction standards as well as regional airport land use commissions to control development around airports. Now that is a noise phase, however, I am afraid it has been a failure. The principal objective of the state noise standards is to obtain zero impact by 1985. Zero impact is defined as a situation where there are no incompatible land uses within the noise impact area of 65 CNEL or greater.

I draw your attention to our current 75 CNEL, and it runs across the property lines that were all appropriated with our condemnation that I mentioned.

For 140 miles there were homes along the beach sideline. This area was a golf course originally so I would not include that; and in this area and in the eastern end of Westchester. Now all of that property is inside the 75 which I will trace here. I know it is difficult for you to see from where you are.

The 75 runs like that around LAX. You will note that the 75 is even encroaching within the property of the City of El Segundo, and when you condemn land and negotiate the purchase prices that I mentioned and all the ancillary inducements that lessen the trauma of selling your home, El Segundo has not requested the Department of Airports to consider condemning and paying for the properties in El Segundo, they prefer to remain there. Their property is very expensive, as I think you can imagine looking over the beautiful Pacific.

For these people here when they had to see their homes with the sites along the coastal area of California where it is very limited -- it has been well controlled with the Coastal Commissions -- as a consequence those people were unable to replace those sites. Oh I imagine some of them did but not many of them could afford to buy more developed or increased prices over the years. Now that is all completely vacant.

I may mention, however, a special appeal by a woman who never, or in very few instances, missed a homeowner's meeting group against the airport -- that she went and made a personal plea -- she lived right in this area -- to be the last one to leave, but she was denied that. Upon the clearing of her escrow -- she was paid off finally -- she had to move, but she wanted to remain and I can understand. I think there are all kinds of wants and traumas that people suffer. They have lived there for many years and it is very understandable why they did not want to leave but, nevertheless, ultimately the only solution to her and the neighbors' problems was to get them out of a high noise area.

The Department of Airports proposed recently to the Los Angeles City Council and the council has passed as an ordinance a noise control regulation that is patterned closely after FAA Rule 19, and would insure timely compliance with Part 36. Essentially the objectives of the proposed noise control regulation and to set a limit on the existing noise and to provide for the orderly reduction of aircraft noise over a specific period of time.

More specifically, the objectives of the proposed regulation provide a set of rules that can be monitored and achieve compliance with Part 36 no later than January 31, 1985 by a systematic phase-out of non-complying aircraft.

This regulation, as drafted, will be responsive to the needs of both the communities and the air carriers. A copy of the noise regulation itself is available. Rather than expending a lot of time explaining the precise details of the proposed regulation, I have brought a copy and I am sure, hopefully, it will be reproduced and be annexed to the compilation of the proceedings of this group.

Now to cover noise litigation for a moment relative to the experiences of a large airport. The Los Angeles Department of Airports has been involved in many noise litigation cases, four of which are of some interest. The first of these cases is Aaron versus the City of Los Angeles, 1972, in which the Court held the airport operator liable for inverse condemnation resulting from airport noise. The settlement for Aaron versus the City of Los Angeles was approximately \$650,000 for property damage and avigational easements.

The Aaron case was soon followed by the Japan Airlines versus the City of Los Angeles case, wherein the Court established that the airport operator, in this case the Department of Airports, did not have the right to require indemnification from the airlines for inverse condemnation costs.

The Crotti case concluded that the airport operator had not only the right but the obligation to control aircraft at airports.

The last case is the Greater Westchester Homeowners' Association versus the City of Los Angeles. This case involved both inverse condemnation and personal injury -- such as loss of hearing and emotional distress - which has no specific legal criteria. The inverse condemnation portion of this lawsuit was settled several years ago. However, the portion of the lawsuit which deals with personal injury and emotional distress is still under appeal.

Several homeowners in the Greater Westchester area had claimed both personal injury, such as hearing loss, and emotional distress, as a result of aircraft noise. The Court awarded \$86,000 to the plaintiff for personal injury; however, subsequent to that decision another case, the San Diego Port Authority versus Superior Court was adjudicated. The Court held in this case that the airport operator is not liable for the noise impact of aircraft in flight, therefore, the personal injury and emotional distress portion of the Greater Westchester case is under appeal and the San Diego case may prove beneficial to the department's position.

In the Los Angeles City Unified School District versus City of Los Angeles, the plaintiff claimed \$140,000,000 in inverse condemnation affecting 62 schools and several thousand children. The case was settled out of court for \$21,000,000 which gave the airport significant avigational easements for aircraft overflight, provided now that those easements are not burdened overtime with a noticeable increase of operations as provided and stipulated in the settlement.

The noise monitoring system was installed under contract with Hydrospace Challenger to assist in assessing the effectiveness of the department's policies and those of other agencies to lessen the impact of aircraft noise and to comply with the monitoring requirements of the California noise standards. The system, which cost \$250,000 monitors all aircraft operations with two kinds of information. First, the peak noise levels of each aircraft overflight and, secondly, the accumulated noise to which a community is exposed for a twenty-four hour period. In both cases the system distinguishes aircraft noise from barking dogs, automobiles, lawnmowers, et cetera.

The monitoring system also records noise and percentages of jet aircraft operations for each of the four runways at LAX. A map display board,

which includes an aerial photograph of the communities surrounding LAX and the location of each of the twelve remote monitoring sites, provides a readout in dBA for each aircraft overflight, and keeps a twenty-four hour record upon which the daily airport CNEL is computed. Since we installed that, hardly anyone in the community ever comes by to look at the numbers.

The noise monitoring system has the capability of producing daily CNEL information so that we can develop our quarterly CNEL contours that are submitted to the state. And the noise monitoring system is an integral part of our noise regulation recently passed by the Los Angeles City Council, in that we have specific levels of the twelve microphones that shall not be exceeded by a new operator with a new type of aircraft. And if he were to introduce a new aircraft that did not operate between January 1978 and June 30th of 1978, upon which the monitoring system established that two percent of the operations would exceed a given level at the twelve microphones. Now if a new operator comes in, he must demonstrate that two percent of his operations will not -- that ninety-eight percent of his operations would not -- exceed the levels established at the microphones. I hope I have made that clear.

What it is, it establishes a capstone on the amount of noise -- presumably a capstone on the noise that is currently being generated at LAX, and that a new operator should he introduce a new type of aircraft -- and let's take one, the SST -- he would have one difficult time in operating at LAX in view of this ordinance should it be upheld if it has been challenged in the courts.

Now we are running short of time and that is all I am going to say unless you have questions afterward.

DR. BRAGDON: We are now going to change direction and go from the civilian side of the spectrum, commercial air carriers, to look at the experiences of the military side. The head of that program from Washington, D.C. is Howard Metcalf, Deputy Director of Construction Standards and Design with the U.S. Department of Defense, and Howard is in charge of the AICUZ program which has been operating, interestingly enough, well in advance of what the commercial air carrier has done and has a long history back to the late '50's.

MR. HOWARD METCALF: Thank you very much -- and presuming that my voice holds out, I may get through this thing. I was sorry I was not able to participate in this conference, but I got a sinusitis-bronchitis thing the other day which knocked me completely out, and I hope that I am about ready to recover and enjoy a long three-day week-end.

Our policy is called Air Installation Compatible Use Zone, "eye-cooz, ai-cooz," whatever pronunciation you like to put on the combination of letters. It was developed originally along about 1972. We sent copies of our proposal to roughly 150 different state offices, area clearing houses, and federal agencies, et cetera, for comments and we received replies and comments from about fifty of them at the time.

We made several changes and our current one was again revised in 1977, but this time we did not go through the long environmental impact process. However, we did publish it in the Federal Register and received

exactly two comments on the current one. So apparently either no one reads the Federal Register or people have lost interest. I am not sure.

The AICUZ concept was originally composed by the Air Force in a concept called Greenbelt, and in the Greenbelt concept we would have bought a piece of land roughly two miles wide and five miles long centered on every runway we owned. They proposed this concept because we were getting a lot of complaints about noise. Development was occurring around our bases and in some cases the complaints about noise were escalating into suits and something had to be done.

A large military installation, jet installation, today costs maybe four, maybe \$500 million just for the fixed facilities on the base. I can remember when they cost five hundred twenty. And if encroachment occurs to such an extent that we have to move the airfield, then that investment is gone and the development around the airfield that has occurred probably because of businesses that moved in around it. The businesses are hurt, the people and land values are hurt, and everything -- the Department of Defense, the taxpayer, the local community is hurt if we have to close an installation and move to another place, and we really had to do something.

The Greenbelt concept as it originally was proposed was very simple. We bought the land and left nothing in there. It would have cost -- I don't know, various estimates from four to \$8 billion were suggested. We did not have four to \$8 billion and we looked for another system. So we proposed and adopted our first AICUZ program in 1973.

Basically, what the AICUZ program does is tell people what we are doing. We tell them how much noise we are making, we tell them what we think is compatible with this noise, and in our original plans we still did plan to buy a fair amount of land and a fair amount of interest in the land rather than set up restrictive easements.

We do not like to buy land. We like to spend our money on airplanes, tanks and carriers -- whether nuclear powered or oil powered, either way -- but we do not like to buy land. We do not like to manage land. We do not like to take land off your tax rolls. We do not want it. We do not need it. If you look at the map of government-owned land west of the Mississippi, you might dispute that, but really, the Department of Defense does not buy any land we do not need.

Also we have to ask Congressional approval when we buy land. We have to get authorization, and we have to get funds. When we started asking Congress about this, Congress suggested maybe we were not doing the right thing, that purchase of land just for noise reasons alone probably was not in the best interest of the country. And in fact three of the four committees we dealt with in the House, Senate, Appropriations and Armed Services, three of the four committees were disturbed that we were considering buying land for noise reasons alone, and they suggested that we might concentrate more on the safety aspects of accidents -- buying land in the high accident potential areas -- and concentrate much more on cooperation with local communities and local planning boards, and getting zoning in the noise areas.

Basically that was the change in our 1977 policy. We just put more emphasis on the cooperation with the local boards and more emphasis on zoning

and restricted in general the purchase of land to areas where we could show that there was a probability of accidents, not a specific probability but a significant probability, and the accidents do tend to occur off the ends of runways more than they do the further we get away from the base.

I think I should say that we stress in our policy the same thing that the California Airport Board does and just about everyone else does that looks at this problem. The first thing we will do is try and cut down the amount of noise we make. Indeed we have changed traffic patterns, we have, in some cases where we could, done away with night landings. We have spent over the years -- well, I will not give a figure. We started buying sound suppressors for Air Force engine runups way back in the early '60's. I think we have practically all of those covered on Air Force fields, Air National Guard fields, and on a lot of Navy fields.

We have bought, on occasion, hush houses where the whole airplane is enclosed for runups and these run three and a half, five, six million dollars apiece. We would prefer not to have to do that. All these things cost money, but that is the first thing we tried to do, cut down the amount of noise we make and we are still going to end up making noise that people do not like.

If we then go out to buy some land or interest in land, the Congress has insisted that we have complete records of all the discussions and negotiations, and the testimony and so on and so forth with local boards, with planning commissions, and so on -- and this is good. In the process of making these complete records you can be sure we have talked to everyone. We have really tried to inform the public, and basically I think we have.

I heard a comment this morning that there was not a lot of information available on noise contours, and we have both our Air Force and Navy studies in libraries, and in county planning boards, and in county and city councils, and so forth all over the country. We print thousands of those things whenever we make one up so they should be available. They are available somewhere and that may be in some cases where we just have not got out the word as to where to look to find them, but they are, in our case anyway, available.

In the course of making these studies, developing these studies as to where the noise zones are, where the accident zones are, what might be done, we involve the local people in the making of the study. We do not want to all of a sudden publish a book some day that is going to significantly affect possibly real estate values, or existing homes, or possibly new homes, without the people who are going to be affected having been involved in the production process of the study. So we insist that all the local commissions and board people be involved right from the beginning in the making of the study, not just when it is finished.

I have not really been following my written thing here at all, but it says: Does the system work? Sometimes it does. The Air Force has published as of last week seventy-three AICUZ studies of twenty-five jurisdictions having included the AICUZ studies in their comprehensive land use planning process and in their plans. Two areas fully incorporated the AICUZ recommendations in their zoning recommendations.

Thirty-three areas have incorporated parts of the AICUZ study in their plans. In only ten areas can I find requests for zoning changes or building permits that were denied specifically because of the results of the AICUZ studies or changes that would have been permitted otherwise, that is, denied strictly on the basis of noise or air traffic.

Two states where it was necessary have passed laws allowing local governments to include the AICUZ studies in their zoning or land use planning. Two states have bought land in our high accident potential zones to keep the land from being developed. These are El Toro and one is Hill Air Force Base at Ogden, Utah where the state actually bought a fair amount of land.

On the Navy's side, when you run down the number of Navy studies that have been published, I think it was 40-some right now. Jacksonville, Florida enacted zoning regulations including compatible use zones for three Naval Air Stations in the area and the local Jacksonville airport.

In Maryland, zoning regulations were passed incorporating the AICUZ studies into the zoning regulations. In this case, however, I am challenging the court. The court held that where some uses had been permitted prior to the adoption of these zoning regulations, the uses still would be permitted. So zoning in all cases is not a final solution.

In some Navy areas, the Norfolk area perhaps is the best example, and Virginia Beach was mentioned earlier today, the encroachment is such that about the only solution we have if we want to protect the Oceana Naval Air Station is to go buy out stuff that is already built and move it away from the ends of our runways and the boundaries of the base. This is extremely expensive, and what it would cost in the long run now I do not know. I think through 1980, which began Monday, we will have spent \$20 million there, which of course is nothing compared to what they spent around LAX, but over the years it may be considerably more.

We do not plan any major changes in the policies we have now in the immediate future. We do have -- and you may notice this if you study it -- a different situation for the Air Force and the Navy. Air Force bases are generally in more rural areas with less development around them. Navy bases are generally right smack downtown in a beautiful coastal area where development is going on, whether this is the San Diego area or the Norfolk area or Florida.

So we do have a different problem in general for Navy installations than we do have for Air Force installations. In general, we will probably be able to handle most of our Air Force bases with local zoning, local land use planning, whereas we may have to buy land and buy restrictive easements and land in most of the Navy facilities.

I am trying to be very general here. I say most because there is no absolute in any of the situations. I have not mentioned the Army. We do have Army air fields which are probably more comparable to your general aviation air field in that the aircraft are smaller. Army air fields are generally not a problem because Army bases are very, very large. Their air fields are small

and they are using light aircraft and the air field is maybe within a few miles of the installation. So you have few problems with the Army air bases except one or two problems where we have a high concentration of helicopters and helicopters can be noisy.

Generally that is our experience to date. As I say, I departed almost completely from my prepared text here. I hope that you will have a chance to read it, and I hope you will have a chance to read the policy that goes with it -- the Air Installation Compatible Use Instructions. And that is all I will say at the moment.

DR. BRAGDON: We appreciate your coming and also your presentation. It is interesting to note the findings of your experiences which have not been accounted for in many other areas. So it is good to see that the DOD is looking at a follow-up on what the master planning process has been in terms of success.

We are moving into a third area here dealing again with application. This deals with work done up in Minneapolis, which again has been very significant, and there are a lot of applications to the rest of the country by virtue of some of their, I think, very innovative, large-scale planning requirements -- particularly through the Airport Zoning Act which was passed in that state.

We have a representative from that area, Jeff Hamiel, who is a Noise Abatement Manager for the Metropolitan Airport Commission in Minneapolis. Jeff is going to discuss the experiences of air carrier operations in terms of general aviation planning.

MR. JEFF HAMIEL: Good afternoon. Excuse my voice -- I have the same problem the previous speaker had, I guess.

For the last two and a half days or so, many of you have come up to me and expressed a real interest in listening to my presentation, my talk I guess, and I have really been flattered until I realized I was the last speaker on the agenda and after I finish you can all go home. Now I understand my significance.

Okay. Minneapolis-St. Paul, Minnesota has enjoyed, I think, a reasonable role in the area of noise abatement and airport planning over the past ten years I suppose. We do have a pretty good system of airports and I think some of the statistics I could provide you with today would surprise you. We operate five of those general aviation airports of the 14,000 plus airports that you have learned of around the country, which you have heard reference to over the last two and a half days.

The system is larger than most of you would expect. In fact, I would go so far as to say that the Metropolitan Airport Commission's system of airports is the third largest system of airports operation-wise in the United States today. Los Angeles, and Walt has the honors there with the largest number of operations, followed by Dade County, Miami and then comes the Minneapolis-St. Paul International Airport and its general aviation facilities with about one point two million operations a year.

How does this relate to general aviation? What I will do throughout the talk for the next few minutes is discuss Wold Chamberlain Airport, which is our air carrier airport, and then I will go into the G. A. operations which are really the bulk of our operation. Our air carrier airport has about 263,500 operations a year, all of which about 122,000 are G. A. operations.

But more importantly, our remaining five general aviation airports consist of about 887,500 additional operations a year. So you can see that the vast majority of the airport-aircraft operations in the metropolitan area of Minneapolis-St. Paul is really general aviation activity. So we feel that although we have gained a reputation throughout the country as being an air carrier-oriented noise abatement program, we do in fact have a pretty extensive G. A. program also.

In 1978, approximately thirty-three percent of our traffic, total operations, were associated with Wold Chamberlain Field, our Minneapolis-St. Paul International Airport, and the remaining seventy-seven percent go to what we call our reliever airport system. The word is genuinely selected as reliever and not secondary, because it is a reliever of Wold Chamberlain, that airport.

We tried to provide comparable facilities to general aviation operators and we are in the process of developing two intermediate -- and I will clarify the two in a moment -- intermediate airports to meet the business and business jet needs.

We have a unique political structure in the State of Minnesota and particularly within the metropolitan area of Minneapolis and St. Paul in that we have a regional, seven-county planning agency known as the Metropolitan Airport Council. They play a significant role in designating the needs of the metropolitan area in all aspects of planning but also in the area of air transportation.

The Metropolitan Airport Council, to diffuse a sensitive term, has changed the FAA's terminology of general utility, air transport, air carrier to a minor, intermediate and major designation. Something just happens in the community when you talk about operating an upper county airport to make it a basic transport. Pretty soon we have visions of DC6's and whatever anyone else can fly, just an occasional jet airliner. And so they have elected to go with the term "intermediate," but it is just a basic transport airport.

Passenger-wise -- and I will just give my last little pitch about the Minneapolis-St. Paul International Airport -- in 1977 we had about 8.4 million passengers go through the facility. In 1978 we had about the same number, which says "Hey, Minneapolis is not growing." But as a matter of fact, during the four busiest months of the year, Minneapolis's Northwest Airlines, which account for about forty-two percent of our operations, were on strike -- so we took a real hit. It was probably the most effective noise abatement program that I have had since I have been with the MAC -- and I will have to claim all the credit for it.

In 1979 we were looking at the close of this year somewhere in the vicinity of ten and one-half to ten and three-quarters million operations.

Some folks want to say eleven, but that just scares the everloving out of me so I will just go with ten and a half. So, there is growth and they are anticipating additional growth.

Contributing to the growth of the Minneapolis-St. Paul International Airport has been the Deregulation Act of 1978. In fact, two weeks ago, the Great Lakes Regional Office of the FAA called and were very curious: Jeff, what is happening in Minneapolis with the noise abatement program? And I kind of thought it was peculiar; you know, they know as much about it as we do basically, and I really did not understand what Bob was getting at.

What it boils down to is that statistically Minneapolis has experienced probably the heaviest hit of any airport in the country with about an increase of twenty percent in our air carrier activity in one year. They have applications for twelve additional air carriers, we already have eleven on the field, and we really do not understand completely why there has been such an influx of increase, but it is there and we have gone from daily airline operations of about 430,000, 440,000 a day up to 520,000 operations a day at the present time, and I think our new consolidated schedule is going to hit five and a quarter.

So it is a healthy increase and it is one we have to deal with. Interestingly enough the community residents near the airport have not increased their complaints. In fact, the complaints have decreased. I will caution you and qualify it, and I will say this: with our citizens groups we do not use the complaints as a real barometer, as a measure of noise impact, but it is a way of keeping in touch with the community and I am quite surprised that the complaints have absolutely decreased.

The nighttime activity in Minneapolis -- and I will discuss this in a moment -- has not increased substantially -- in fact that means one or two operations, and that is after a good deal of arm twisting, jawboning, and intimidation.

We have in Minneapolis some seventeen various noise abatement programs in effect at the present time. We are also in the process of evaluating each one of those programs because, quite frankly, we think a good number of them were good a few years ago and probably not very effective any longer -- and let's go ahead and get the deadwood washed out of the program and maximize the potential of the programs that are good. Some of these programs were preferential runway system which has been in effect since 1969-1970, and it is very significant, probably the number one program that we have as far as reducing noise in certain areas around our airport.

We have a restriction on airline training flights, and what it boils down to is we do not permit our carriers to do any training at our airport. That is a real problem for our carriers, because we are home base for Northwest Orient Airlines, and we are also the home of what was then North Central and is now Republic Airlines. These two companies comprise about sixty-two to sixty-four percent of our total operation, and both of them at the present time have their training facilities in Minneapolis. However, I understand Republic is now moving their training facilities down to Atlanta, and so for those of you who live in Atlanta, good luck!

We also have a nighttime voluntary agreement at the Wold Chamberlain Airport. It is an agreement signed by the signatory carriers -- at that time only nine -- limiting their operations to the level of October, 1970. That boils down to twenty-seven operations a night, and we define night in Minneapolis from 11:00 p.m. to 6:00 a.m.

That was a painful process and it was done well before my time, but many of you in the audience here did experience it and were participatory in that process. After a good deal of: We can't do it, it's impossible, we're gonna move, you have got to do something. Okay, we will compromise a little bit and back and forth over the course of time, and it resulted in their adopting this 1970 level of twenty-seven, and it is interesting to note that ever since 1970 those levels, or those numbers, have dropped off to the point where today we have thirteen scheduled airline operations per night.

I think it boiled down to economics basically. I think that Northwest and Republic both have the sincere desire to cooperate, which may be unique to the Twin Cities. They have a sincere desire to reduce their noise, and I think Northwest particularly has received national recognition throughout the past ten years in their efforts. So that reputation they wanted to continue with and also the savings -- and there has been a phenomenal savings there. The airplanes that once flew empty or hauling mail, or whatever -- and it was upward from six, seven, eight flights per night to Chicago -- has now been reduced down to one or two. And now we are working very, very hard to retain that.

A case in point: Two weeks ago Don Morrison of Ozark called up and said, "Gee, we just -- there is just no way in the world that we can avoid not putting an airplane into Minneapolis at 12:37 in the morning. Can you help us out? You are just going to have to."

He insisted that that is the way it is. The schedule would not permit it. In a nice sort of way we just said, "No, you cannot operate the airplane at 12:37 in the morning; we are not going to permit it and we will resist you efforts."

And Don Morrison said, "Now come on. I have got this problem. I have got this airplane that is going to jump all over the midwest and is going to terminate and spend the night."

This brought up the next question, "When is it going to leave in the morning?"

"Well about 5:35."

"No it is not going to do that either."

So we haggled back and forth for a while, and Don got together with Ron Gish, who is the station manager, telling him about this guy in MAC who would not permit them to operate. At that point he said he would go with 6:00 o'clock in the morning but he simply had to land at 12:37.

He called us back and -- I am making a long story out of it. What it boils down to was "Well, okay, we will go with 12:07." Now we are an hour and

seven minutes too late. It was 11:00 o'clock in Minneapolis and that is where we were going to hold it, and if he wanted to go beyond 11:00 he had better go to -- this is what I told him -- to one of the other airline companies that already holds a slot that they are not utilizing and borrow time from them.

Well Northwest and Republic are not in the mood for giving away their slots, because they are kind of hedging, and with their reputation of trying to keep the noise at the minimum level. So finally it went on for about three or four days with no call from Don Morrison. I thought I had better give him a call and find out what was happening, because when things get quiet we do not like it in Minneapolis because most everyone does talk. We have an open dialogue and pretty much an open-door policy with the carriers. So I was in the process of looking up Don's number when my phone rang. He just said "Alright, we cancelled it. We are not going to fly in Minneapolis. We figured out another way; but geez, sometime we have got to get in there in the nighttime hours."

I said, "Well maybe sometime in the future something will happen where the Commission will do that but right now, no dice."

This goes on continuously. Sometimes we are successful and sometimes we are not because, when you get right down to the bottom of the line, the airport proprietor really does not have any business telling an airline company what time it can operate or bring equipment into an airport at night. But through the cooperation and I guess a little bit of intimidation and jawboning, as I mentioned the first day, it does work. And for those of you who deal with an air carrier on a minimal basis, communication really does help out.

Of course it has taken a lot of years to get to that point. The noise-impact departure procedure I am not going to dwell on. It is a procedure that has been recognized nationally. It works beautifully in the metropolitan area of Minneapolis and St. Paul. Many, many hours of toil have gone into that procedure and most recently the FAA has put out an advisory circular, I guess literally endorsing the Northwest procedure as being probably the quietest procedure available today under most situations.

We have a runup restriction program in Minneapolis. After 11:00 o'clock at night runups are only permitted on an emergency basis and must be cleared through our offices. An emergency, however, is defined very loosely by us because we realize that some equipment that needs repair has to get out at 6:00 or 6:15 or 6:30 in the morning, so it has to be checked before it flies, so there are exceptions to that. But we have it down to the point where we have about 800 runups every two weeks during the night hours and a good deal of that was resolved through the efforts of Dave Braslau of Braslau Associates who did the study for us and through his work we developed a field rule and submitted an order and we now have what we think is pretty good control of the situation.

MASAC -- I will talk about this in a moment. Metropolitan Sound Abatement Council is still a viable, functioning organization after ten years. I think just about every major airport in the country has heard talk of us and visited the Twin Cities and looked at this group. It has a group

membership now of twenty-six persons, thirteen of them are citizen representatives who live in the areas adjacent to our airport and the other thirteen members are user representatives consisting of FAA, the airline companies, and so forth -- corporations in the business or in the business climate.

A good part of the success of MASAC is that we have Art Hinkey (phonic spelling), a retired captain with North Central-Republic who has been there for years and maybe you know him. He was our chief of flight operations up until retirement a few years ago. Ben Griggs (phonic spelling), vice-president of Northwest Airlines, is a regular member and sits in regularly, which is surprising to many but not since as vice-president of the airline he realized it is the best investment the company has in the metropolitan area.

And there are various and sundry other chief pilots and high-level people in management of airlines that I am talking about and they sit in on this board constantly. And it is through MASAC that all of these noise abatement programs have either been encouraged or developed or recommended.

Let's talk about the G.A. airports for a little while.

The Minneapolis-St. Paul International Airport is located right smack dab dead-center in the metropolitan seven-county area. We are a metropolitan agency. We were created by the Minnesota State Legislature in 1943. We are our own municipality. We are not part of the City of St. Paul or the City of Minneapolis. We were created in the state legislature. We have our own police and fire department. We generate our own revenue and we do not depend on the Twin City metropolitan area for any kind of a taxing authority although we do have a one-third mil rate authority.

We do it through various lease and rental agreements that we have and are able to pay our \$22 million a year operating cost or thereabouts.

I should also point out to you that Minneapolis-St. Paul International Airport is the only revenue generator we have as far as paying for itself and through the various concessions -- landing fees, rental space agreements and so forth, land leases to the airline companies that are home-based in Minneapolis -- we are able to support our entire reliever airport system.

That system, which I think you are primarily more interested in now, is associated with Minneapolis airport as is the St. Paul downtown Holman Field, which is presently being developed as an intermediate facility which will be basic transport in FAA terminology. Presently it has a control tower, it sits in a hole, but it is a nice facility. We are putting a new runway in that will extend about 8,000 feet once we get through the clearing process as far as environmental assessments go.

Lake Elmo Airport with 146,000 or so operations a year -- Lake Elmo Airport, estimated at 100,000 is your typical non-tower-controlled airport.

It is rural. It is removed from any real development of population and has a couple of crossing 3,000-foot runways. However, when things start to get hot out there, it is surprising where the people come from, just right out of the woodwork.

Another county airport presently is in real controversy in our system, and quite honestly the airport is in jeopardy as far as development.

The Metropolitan Airport Council designated Anoka County Airport and St. Paul Downtown Airport to be the reliever airports for Wold Chamberlain, so these are in the very painful process right now of starting studies on master-planning that airport and there is a very, very strong citizen resistance group there that we are just now beginning to deal with. But actually we have been working with them for about two years and the planning process is now started and the revitalization and participation of the public have also been revived, and so we are having some real serious problems there.

Crystal Airport--Anoka County Airport, by the way, has about 190,000 to 200,000 operations a year and Crystal about 200,000 operations, a tower control facility, completely encroached by people but really minimal noise complaints from the standpoint of complaints and citizens' disapproval of its operation.

We do a good deal of things to try to improve the situation here. We just finished relocating runup areas as runup areas prior to takeoff. All of these airports basically are single engine prop, primarily intensive airport with some jet operations.

The largest G.A. airport we have in our system, with a little over a quarter million operations a year, is Flying Cloud Airport, and we have just met a success story at Flying Cloud and some of you may be aware of some of our efforts down there. In fact, I will be happy to elaborate for a moment on that because it is interesting I think.

Two years ago, Flying Cloud Airport was in the process of moving out of the single engine prop area and we saw an introduction of corporate jet activity. The operators have been there but all of a sudden the economy started to pick up and as soon as they saw the increased operations it was their key to start coming down on the airport. That was the beginning of a very difficult process that went on for many months, which resulted in what we call ordinance 51.

It is a jet restriction on the airport; it is a compromise the airport commission made with the community and we found it to be initially a good idea, with some hesitation about restricting any airport, but it has proven now to be a very successful effort. The restriction basically states that only those aircraft that are certified to be in compliance with FAR 36, at the 1975 noise levels, may operate out of the facility, and no jet aircraft may weigh more than 25,000 pounds gross weight.

What it does basically then is limit the airport down to Lear Jets or Citations or Sabre or Rockwell Bonanza. To date we have had in the last nineteen to twenty months five violations and all five violations were dealt

with from a corresponding standpoint reproaching the pilot and basically it is not being aware that there was a restriction. It has given us some peace with the community, so much so that the citizens committee that we worked with at Flying Cloud Airport recommended a runway extension program to put traffic to the south of the airport, so that is a success story.

As you see, this is the Minnesota River. At the present time you have two parallel runways running east and west and prior to the expansion the northern parallel runway was our primary runway, with all the traffic going up over the residential area near Flying Cloud Airport. With the extension they are routed over a rapid drop of land and terrain, like three to four hundred feet. Now the traffic flow will be concentrating over the river basin and river valley and away from the residential community, keeping in mind, however, that with over a quarter of a million operations a year you cannot keep all the airplanes over the river. But we can put the jet traffic on the longer southernmost runway and keep them out of the community, and put the heavier transient aircraft on the south runway with the small single-engine activity that is quite a bit quieter over the residential area.

So that is the MASAC's system of airports, and it works pretty effectively. At each of these airports we do have citizen participation -- grievance committees, airport advisory panels, whatever called the Flying Cloud Citizens Airport Commission, which is a pretty fancy name for folks to sit down and talk to us, but it works. And I guess it works because in recent years MAC has had a philosophy of we are not arguing with you anymore.

There is a noise problem not only at Minneapolis International but at all of our airports, and we have to responsibly plan for the future. If we do not, we are going to have some serious problems that are going to encroach us very rapidly, and so let us sit down now and talk about it. Let us figure out what we can do to make the system comply, and if we cannot, then we will try to adjust the operation so it will be somewhat at least compatible.

And through that kind of attitude and approach it has been quite successful. I do not know that that would work necessarily with all of your airports, but it works very well in Minnesota because, I think, it is a pretty liberal and politically active group and all they want is responsible public officials. So that is the MAC system.

I should point out that down here to the south there is the Air Lake Industrial Park. This will very shortly be the seventh airport within our system. We are in the process of working out the details with the FAA on installing an ILS system at Air Lake Industrial. To look at it you would be amazed -- maybe 8,000 operations a year at the present time. It is out in the middle of no man's land. It is a single runway operation that is marginally acceptable for operation at the time, but what it does do for us is relieve Wold Chamberlin-Minneapolis International Airport of IFR, ILS training type activity.

The big flaw in our Minneapolis system is that we have a micro-wave ILS at Flying Cloud which doesn't do anybody a whole lot of good; and we have a microwave ILS at St. Paul Downtown Airport; and we have a conventional ILS at Minneapolis International; and we have several, however many you want to use.

But the problem is -- and it was highlighted with the San Diego incident, accident, situation, crash, whatever you want to use -- and we have all of our G.A. traffic flying around the International Airport so our attempts are to move on down to Air Lake Industrial Park and get all of our flight schools at our G.A. airports to move on down south and use the facility there for a training facility primarily. And as I say, we are willing to negotiate a program on this with the FAA for acquisition. We are looking at about a \$6 million investment down there.

I see our time is running out so let me just spend another minute or two talking about the Metropolitan Airport Council. In Minneapolis we have the typical players in the land use and planning areas: the FAA, the Airport Authority, the Minnesota Department of Transportation, and local governments that are affected by our airport. But we also have another organization known as the Metropolitan Airport Council. This is sanctioned by the State Legislature. It deals with all the transportation needs in the seven-county metropolitan area. Their function, and they sometimes lose sight of it, is to basically tell us what the needs are of the Twin Cities metropolitan area and with the cooperation of all affected parties, including the MAC, we work out and contour our airports, take a look at the growth demands and so forth for the facility utilization, storage space available, whatever, and then the council comes to the Airport Commission with their recommendation.

They do this with what they call the aviation guide chapter of the metropolitan development guide, and this is basically their way of telling us as a municipal agency: Start planning now because this is what our needs are going to be.

Recalling the map that was just on the wall, my council most recently in their 1978 revision have indicated to us that there is going to be a need by 1990 for two new G.A. airports. One will be located in exactly the same industrial area as the Air Lake Industrial Air Park, which is again probably why we are very much in favor of acquiring the property, and also in the northwest suburb area of Hampton County. These have been designated by the council as being future G.A. airport locations and we are in the process of starting our study of that issue.

I was going to talk to you about some forecasting and so forth, but I think I will pass on that because our time is short and I know you are anxious to leave and get on with the panel discussion. But let me say that there are a few unique things -- and this is kind of the pot luck of summarizing -- in Minnesota. We have the Minnesota Pollution Control Agency which is really the thorn in the side of the airport proprietors, but it is a fact of life because this agency has elected to establish a descriptor for a noise standard based on L10 of 65 Ldn. It is a difficult, difficult descriptor to use. What it basically says is that the noise level for the busiest hour of a typically busiest day during the year, your noise level cannot exceed 65, ten percent of that busiest hour.

Okay, I may have said it in kind of a roundabout way, but what it means is we cannot during our busiest day of the busiest hour of the year exceed 65 decibels more than six minutes. That is tough, and I brought along two real quick photographs to show you what happens when you use that.

The first one is our Ldn and the dash lines or the hash marks represent the Ldn 65 contour, and then the darker area represents the Ldn 75. It is manageable, you know, but it is tough. It is a tough problem, so we think that in the process of evaluating and studying our existing procedures and the implementation of additional procedures, I guess making our program run more efficient and so forth, we can draw our Ldn contours in a little tighter and become a little better neighbor with the L10/65 contour.

I have had the lady put that slide on now. That is what we have to deal with and it is a monstrosity. Just take the exterior most line as being the L10/65. We have some serious problems with it and we are going to be discussing this whole descriptive methodology with the Minnesota Pollution Control Agency very shortly.

Let me give you an example of why we have so many problems with it. First of all, it is larger. In fact, it encompasses most of South Minneapolis. This cannot be resolved through insulation of homes for example, because it is an indoor-outdoor health standard that the Minnesota Pollution Control Agency has established.

In other words, if you live in this area your health is in jeopardy based on their definition, so you either live in a house and close all the windows and never use your back yard and never go outside, or we have to comply. Highland Park in St. Paul, for example, looks like we have a tremendous problem from the airport all the way to the downtown area, but in fact that situation occurs about three to four percent of the time. So how do you as a land use planner or as an airport proprietor, deal with this sort of a contour? You cannot do it and there are some serious, very serious problems with it.

But I just presented this thing to you just to let you kind of get a look at some of the problems we are facing and the size. This thing encompasses I don't know how many thousands of housing units. To give you an idea of what our air carrier problems are, the same methodology used at all of our G.A. airports where we have an Ldn contour that does not go off of the airport, we have an L10 contour that does not go off the airport as much as a half to three-quarters of a mile. We can manage that, we can work with that. I think we can bring that under compliance.

Thank you.

DR. BRAGDON: We have three panelists who will be here to react to the speakers and also make any comments they would like to make.

On my immediate left is Gordon Miller, Deputy Chief, California Department of Aeronautics, Sacramento. In the middle is Tom Duffy, Director of N.O.I.S.E., National Organization to Insure Sound Environment, from Washington, D.C. Any to my far left is David Braslau, David Braslau Associates, who is President of that firm located in Minneapolis.

I will let Gordon lead it off at this time. Thank you.

MR. GORDON A. MILLER: First, I want to say the same thing that several people have already said today and that is I am certainly glad I was able to be here. I think this is a great group and we will all go away from here with quite a lot of new knowledge. I find that what we are doing in California has been talked about from the point of view of an individual airport pretty well, particularly Walt's talk when he described, very well I think, our airport noise standards, and at least how they apply to our biggest airport, Los Angeles International Airport.

Those became effective in 1972 and initially eleven airports were designated as having a noise problem under the noise standards. The first step in instituting a noise program on an airport was for the county to designate the airport as a noise problem airport. The main emphasis in these standards was for local control of airport noise.

Recognizing the difference in noise sensitivity between the communities, the Legislature and the committees that were set up to actually draft the legislation and help us draft regulations, emphasized this all the way through the standard that local people working with the standards that were set were to actually determine how the noise would be dealt with.

The noise standards do apply to all civil airports but they have been effective mostly on the airline airports. The noise standards themselves were set with the large jet airliners in mind and we found that on practically all of our general aviation airports the criteria and noise level of 65 CNEL remains within the airport's boundaries, so that under the standards we have no purely general aviation airport that has a noise problem.

The CNEL standard that we use is very similar to Ldn and we have been very happy to see, particularly within the last few years, more and more movement toward using Ldn by nearly everyone. And I suppose that when we get around to making some changes in our noise standards, which I hope we will within the next couple of years, we are very likely to change over to the Ldn method.

Our standards had in addition to the cumulative standard of CNEL, NEF, SENEL, a single event noise level. Within a year or so after the noise regulations became effective, ATA, joined by some airports which shall be named, joined in a suit against the state over the noise standards and the upshot of that; the Court's decision was that the SENEL regulation was tossed out. It was determined by the Court that regulating a single noise event came too close to regulating the flight of aircraft, which is a province retained by the Federal government. So that is no longer part of our standards.

Of the eleven airports which were initially determined by the counties to have noise standards, two of those designations were withdrawn so that we have and still have nine airports that are officially designated as having a noise problem or standards actually, though only five airports have non-compatible land use within the criterion noise level.

Now it was recognized that to reach the CNEL level, which is the criterion level that the standards are aiming for, it would not be possible to

put that into effect immediately. It would have meant practically closing down airports like LAX and several others in California.

I think the people working on setting the standards -- and most of us were overly optimistic on what could be done in quieting the airplanes -- I think we all thought that by 1980 we would be much further down the road toward quieting the airport and coming closer to meeting the standards than we have been able to do.

With that in mind, a variance procedure was set up in the standards so that for an airport that had non-compatible land use in a high noise zone would apply to the department and get a waiver under the standards to operate within the law for the next year. In order to issue the variance, however, we had to work with the airport and determine that they had a reasonable noise abatement program in effect so that at the end of that year the airport would be making some progress toward meeting standards.

Well, we have had I guess as many as five variances now, five annual variances on some of our airports and we are making some progress on them. The airports are all making progress but on some of them we are a long way from meeting the standards. It is also recognized that 65 CNEL was too low a level to start with so we have airports now that are required to only meet 75 CNEL. Those are airports where four-engine jets are operating. They had to meet 70 CNEL by the end of next year and all airports have to meet 65 CNEL by the end of 1985. That is the standard set.

We have at least three or four airports that this probably will not be possible to do. We are going to have to find some way to deal with that, whether it might be something on the order of a SETAC by recognizing that some people would rather stay close to the airport and put up with more noise than others and maybe by insulation or by buying those people out who would like to move out, by buying up the land close in that is just too noisy for anyone to be there and maybe redevelop in compatible use. Some things like that will have to be done.

We are finding now that we have some policies of Federal agencies that are certainly interfering with our meeting the noise standards. The deregulation of the airlines has put a new wrinkle in the whole thing. San Diego, for instance, is one of our airports having a very difficult time in order to comply with the variance conditions we have issued. They are trying desperately to keep the noise level down certainly to what it is now, maybe a little quieter. But at the same time they have several new airlines wanting to institute new service.

They adopted a local resolution or regulation not allowing any new service. They got a pretty strongly worded letter from the FAA saying that they could not do that or they would lose all the Federal money they had and all they ever had and maybe go to jail. And that has happened at Santa Monica and in Orange County and at Burbank and it looks like it is probably going to happen in San Francisco.

So we have two Federal policies really that are banging heads together right now -- that is the Federal airport noise policy and the deregulation policy.

Of course, there is a strong impetus in the Federal Administration to make deregulation work, so I do not know how that is going to be resolved -- in court, I suppose.

I mentioned the other day, yesterday, that we have an Airport Land Use Planning Law. It is not directly related to the noise standards themselves but, of course, there is some relationship there in that that law requires an airport landings commission to be set up in each county that has an airport and that planning related to noise abatement be done around each airport and as I explained yesterday, that is not being very well done.

There is no time specified when those plans have to be done. There is no fund provided for it in the legislation and there just has not been very much participation. It was a good idea and has raised a lot of discussion about planning around an airport. I think people in California know more about what can be done than they would have if we had not had the commissions formed, but it certainly has not done the job that we hoped it would.

We have provided noise monitoring for some G.A. airports, airports where we were certain that the noise did not exceed what the noise standards called for, but recognizing that nevertheless those general aviation airports had noise problems and needed some way to identify where the noise problems were. Torrance was one of those and we agreed with airport management there that if the noise could be described, it would put the airport in a better position to discuss the subject with the community and that has really come about.

I think the fact that Bill Critchfield has a very sophisticated system for monitoring noise and being able to draw noise contours has put him in a much better position to have a meaningful dialogue with the citizens and with the pilots in encouraging the pilots to fly more quietly.

Incidentally, the pilots' group has objected to having the noise monitors in Torrance. They threatened a lawsuit. I think if they could have gotten enough money together they might have had one. But I believe that everyone concerned has recognized that having that monitoring available was very helpful in working out the problem with the program that they have there now.

One other thing I would like to touch on just briefly. We have not had very much discussion about the Federal noise bills that are pending in the Congress now, Kennedy's bill on the Senate side and the House bill also pending. There are some good things in those bills, money for noise abatement planning and of forcing implementation, but as most of you know there are also some provisions to waive the date for compliance with FAR 36 and we are very much concerned about that -- and I guess we would, or I know that we would like to have noise legislation. We would like to have the good things that are in those bills but if we had to, we would be willing to give that up to be sure we do not get those waivers in.

But we are hoping that the move to take the good parts of that bill out and fold it in with ADAP legislation will come about. I think that is all I have.

DR. BRAGDON: Tom?

MR. THOMAS A. DUFFY: I think I came to this conference as sort of a basic training session because the N.O.I.S.E. group has been involved almost completely with air carrier noise problems in the past. I have learned a couple of things and I have a couple of things that I want to react to that I have heard this week.

I function as staff for N.O.I.S.E., the people who write my paychecks, or the U.S. Conference of Mayors and the National League of Cities. I have been listening for a couple of days to how every land use plan related to an airport in the country has caved in within fifteen minutes of somebody asking to encroach, and I have heard people try to analyze why that has been happening.

We heard the dramatic statement of some "indictably" corrupt operations in Orange County the other day. Last night, quite humorously, we heard about some folks who stood to gain by operations of land use games near them, very friendly with folks who did. We heard the other day of the folks who were unsophisticated whom I took to be dumb, and I recognized several of those people because I have been working with city and county officials nationally for seven years or so. I probably know or have known between 1,000 and 1,500 mayors and city councilmen from all across this country, and frankly I did not recognize the profile that we have heard drawn this week with the profile of people I have known in those seven years across the country.

I think of a city councilman in Fort Worth, Texas who is well off, net worth \$750,000, not in the land development business, who gets paid \$10 a week if he shows up at a council meeting. He is not in it to make a bundle any more. He is not in it to take care of his friends. He is in it because he figures that he has made a good living from his place and he owes it a couple of years of services.

Now, those guys -- and I take Fort Worth because I am very intimately familiar with those people -- spend their time and spend their worry and spend those couple of years of hard service, I think, with some very honorable motives.

Now there is still a question. Why do all these encroachments take place? Why do local officials seem so uninformed, dumb, whatever, when you try to come to them with airport needs, and Lisa Wogen of the National League of Cities and I were talking about this the other day and we evolved part of a theory anyway.

Part of it rests on the fact that local politicians, like all other politicians, thrive on compromise. When they run into airport noise problems there does not seem to be any avenue of compromise for them. They have on the one hand neighbors who are screaming and yelling, "We need help. We are being molested in our homes by this noise. Do something." They go to the airport

on the other hand and the minute they talk about fixing noise you get pilots talking about, "You are trying to ruin safety and make us crash," and all this sort of thing. That is all they get. They never get into the avenues of compromise that are normal to them in every other thing they do in the country.

And perhaps one of the things we should learn from this and the talk about communication and education we have had for everybody else and heard about for a couple of days, is that they need to be shown some avenues of compromise.

The Torrance experience I think is an excellent one in a sense because they went out and told the local officials and people about the things that could be done in their operations and were being done and when people understand that things are being done, they help.

Some ways of compromise of land use -- of the Los Angeles airport experience, some of those cities, Inglewood, are finding out that you may have to move people but it does not have to be a dead financial loss. What you can do is redevelop in an economically profitable way so there does not have to be a monstrous cost to the city, State, and Federal Government. The point here is that if you show them the avenues of compromise that they can follow in the ways that they do everything else, they will be more amenable to meeting airport needs or going at least halfway toward them.

Other subjects -- Let me put to you a proposition. The proposition is this: that airport operators do not have a noise problem; that aviation manufacturers do not have a noise problem; that planners, anyone else we have heard this week, do not have a noise problem. Only people have a noise problem. The problems that all the rest of us have are in reacting and dealing with the people who have a noise problem.

Now, this is not just a cute little exercise in semantics. There are a couple of lessons to be learned by it.

When we look at a problem, we look at it in our terms. If we are planners, we look at it in planning terms. If we are airport operators, we look at it in airport operational terms. If we are pilots, we look at it in terms of how do you operate an aircraft, and you concentrate on those aspects that you can deal with. If you are a pilot, you deal with pitch settings or rpm's. If you are an airport operator, you deal with flight patterns. If you are a planner, you deal with land use controls. You take a piece of the problem and you deal with it from your point of view.

And because you are a professional you abstract and you go further and further and further back. It dawned on me yesterday when I was listening in the name of a noise problem to a discussion of why it took three and a half years to get a certificated engine onto an airframe to fly it. Now, as I thought about it and later I figured I could get back to where we were to the discussion on the noise problem, but I had to make an effort. We tend to extend or attenuate our thoughts I think in our own disciplines, far away from the basics of the problems and maybe now I am suggesting the Vince Lombardi approach to airport noise maybe, to get back to basics.

If you don't, what can happen? -- is something that has happened with the noise bill we just heard about, Gordon talked about.

Somehow, the people who are interested in having this noise bill passed managed to convince the Congress by some kind of strange logic that the noise problem was how much money the airplane manufacturers had and the airlines had to pay for retrofit and reengining, and that in fact by passing this noise bill you were solving the noise problem. Now that again on its face is stupid, but if again you get far away from the basics, that people have noise problems and nobody else does, you can get back into that kind of a logic and you can get bills whipped through the committee or the whole Congress on that kind of basic.

I struck the other day when I heard about avigation easements; thought about these for a while. Avigation easements do not solve noise problems. Avigation easements solve the legal liability problem for an airport operator, which does not approach whether people get sick or are hurt physically or hurt psychologically or can live well because an airplane flies over their head. Just because an airport is able to buy an easement and can thereafter fly with unlimited noise over an area forever, the third owner of that house after they got nothing out of the original easement payment for it and is suffering from the noise problem and has less ways of dealing with it as a citizen of this country than the original owner did. And when you go into quote solutions like that, I think quite often we are getting on the wrong track.

It is an iffy legal device but it just does not approach the main problem. I think that is just about the sum total of what I have to say.

DR. BRAGDON: David?

MR. DAVID BRASLAW: Let me just briefly run over my background so you will know where I am coming from. We have done a lot of noise modeling -- highways, airports, and other areas. I am chairman of a committee in Minneapolis called the Metro Clean Air and Noise Committee. I am chairman of the American Society of Civil Engineers' committee called the Air Site Committee which deals with air space around airports. And I am now vice president of a new group in Minneapolis call HUSH, which stands for nothing unless you can think up a name.

My company is an associate member of the National Business Aircraft Association. I was attending a conference here last week and we also fly a Cessna 310.

We have worked on air carrier airports, general aviation airports; we have done master plans and we were the people that were guilty of recommending the change in name of minor, intermediate, and major airports in Minnesota that Tom Duffy talked about, and we also recommended that the Hampton County Airport be upgraded to intermediate, which means it would handle business jets. My day was made however when Jim Scott held up a report from MBA and

said it was one of the best reports he had seen to the benefit of aviation. That was a study we completed for the Division of Aeronautics and Department of Aeronautics in 1975.

Now I think the concept of the level of expectation appears to be very important for general aviation noise impacts. We were talking with John Schettino at lunch. There seems to be a possible threshold level above which people will complain and below which there are not always complaints evident. A fellow in Sweden has been doing some work in this. That threshold is approximately a hundred operations a day. Was that jets?

ATTENDEE: That is what my memory was.

MR. BRASLAU: Now, we have done a lot of work on the intrusiveness of noise in very quiet areas. We did a snowmobile study in Minnesota in which we found out you could hear a snowmobile for as much as ten to fifteen miles away. A more recent study was done as part of a copper-nickel study in Minnesota, where analysis was done on the distance away where you could hear the trucks that were actually involved in the mining, and this was in the wilderness area.

There are four basic categories of noise environments: urban environment, suburb environment, rural environment, and the wilderness and national park environment. Urban environment, of course, you can make no noise. Suburb environment, of course, we have trouble in the Twin Cities where the intrusiveness is not quite as critical. In the rural environment, as well as the particular wilderness environment, it becomes extreme. In fact, Jackson Hole Airport is a good example, where the airport will actually be closed eventually because it is inconsistent. It had been found to be inconsistent with the quietude that is supposed to be found in the national park.

Another area, Ldn -- Technically, I do not think the Ldn contour is completely well defined. I do not think there is agreement among the people who are predicting Ldn. I have heard the term used in a lot of different ways but I have heard discussions about contours and I have heard discussion about Ldn at points. I was talking with Dick Procnier about Buchanan Field in California and he indicated that the consultant had come up with an Ldn contour, as you usually find in small airports, and indicated that for measurements the contour was actually a big circular area which was indeed much larger.

I think one problem here, and maybe he could clarify this, I think that the concept of Ldn was developed initially when the levels documents referred to an average-annual exposure. And I think if you take the maximum exposure for each day and you look at the locus of all these, you will end up with a much larger contour. I think if you do that you will lose the relationship between NEF and the complaints which I feel have developed in average-annual traffic. And this is another area that I think should be at least discussed in a little more detail.

The Ldn is, I think, not sufficient to describe the noise environment of small airplanes. I think you need something like times above or duration above, time of frequency. We have done a lot of studies in Minnesota where we have this L10, and where we have actually related L10 to time above levels, to

Ldn and Leq. We have found that the 10 Ldn number is not good enough any more. It is actually a non-linear function in incline with the log. So, there is a complex relationship between Leq, Ldn and time above.

And I think that when you get down to the airports with a small number of operations, the Ldn really falls and I think that is why people have mentioned this, that people complain even though the Ldn is below 55. Joan Caldwell, I think, mentioned this too.

One issue that I just wanted to mention, helicopter noise. At the NBAA last week there was a lot of discussion about executive helicopters. It is going to become more and more and more an issue and I think this was something that was not really touched on here. This is something that I think should be given some more consideration.

For EPA, in their interests in looking at general aviation aircraft noise, I think in Minneapolis the problem of reliever airports is very important. That Anoka County Airport, which was recommended as a reliever, was done to remove this traffic from Chamberlain and therefore to keep the noise contours at Chamberlain reasonably small. So therefore the issue of general aviation airports and general aviation noise is not strictly one of the G.A. airport contour or impact itself. It has to be tied into hub areas with the idea of keeping a major hub airport contour small by removing a noise.

This brings up an issue. The HUSH group was founded actually last week. We had a meeting. NANCO, the National Association of Noise Control Officials, met there with EPA. Chuck Elkins was there along with Dick Bartwith and there was a person who was fighting the Anoka County Airport. She was asked to be on the board. We had a dinner and she met me. She found out that I was one of the people who recommended her airport be expanded; that was strike one.

Strike two, the organizational HUSH meeting was going to be held at Walter Rockenstein's house. He was an alderman who has been very active in dealing with the Minneapolis-St. Paul International Airport and he has also been pushing in some respects for the Anoka County Airport. I will not go into the history but Minneapolis was going to have a northern airport site at one time. The idea that the EPA was coming to meet at Walter Rockenstein's house suggested to her that this was in fact a guise to push for a northern airport again and to put it in Anoka County, and that the upgrading and master plan for Anoka County was in fact a guise to develop a new major airport in Anoka County -- and she declined to come to the meeting. In fact, she declined to serve on the board.

And I guess I would like to know how one deals with people like this who are so paranoid, who are so mistrustful of the establishment that -- we are looking for ways to deal with them so if anybody has any suggestions I would appreciate the advice.

And I think finally, Minnesota is proposing or somebody in Minnesota is proposing a noise disclosure act for the state and our committee is having a meeting on November the 8th to discuss some of the applications of this. The reason they are doing this became very clear that it is not clear to us. What should be included in a noise disclosure act as the level? Is it location? Is it the type of source? In other words, what do you do in terms

of value and property value degradation? What do you do when somebody is in fact told that the noise might be greater here on this piece of property?

Crystal Airport, which was mentioned by Jeff Hamiel, had exactly this problem, not from the noise point of view but just from the safety point of view. Minneapolis has zones A, B, and C and because of the Minneapolis Land Use Planning Act these zones have been on the books for about, I don't know how many years, three or four years. But because of the Land Use Planning Act, they had to be incorporated into the comprehensive plan and therefore they became very important and the people that found themselves in these zones all of a sudden started screaming and said in effect: If you are saying you cannot build in our neighborhood, you in fact are redlining us and reducing the value of our property.

I am not sure exactly what the resolution of that finally was. So if anybody has any suggestions on the idea of noise disclosure legislation and what should be in it, I would also appreciate your input and I think with that I will split.

MR. JAMES K. THOMPSON: I am still trying to get a feel for how important -- I mean, just what is the scope and significance of the G.A. noise problem? I noticed from a report that FAA had that two out of four private airports throughout the United States, the length of the maximum runway is 3,000 feet. Now, that is down to the basic one utility type. It is one out of four, two out of four and one out of four of the civil airports.

Now that says there are a lot of airports with small runways but it does not tell us where they are and it seems like a lot of these airports are located in rural areas and a lot of them may be located in the more congested areas around cities.

I had some ideas on how to get a handle on what kinds of experiences they have. They mentioned in North Carolina where in some areas they are really out in the boondocks. Does anybody have any feel for what percentage of the general aviation type airports really have noise problems?

MR. CAMPANELLA: May I make a comment there. I do not think that is a fair question. I do not think that is a fair question, stated in its general form because most of the airports that have noise problems did not have a noise problem at one time. So if you say what airports have noise problems today you get a set of answers. Five years from now that would be insufficient to the question. I think the only answer is that all airports have a potential noise problem and, as one of the speakers said this morning, there ought to be on file in the courthouse or the county seat somewhere what the noise contour is of that airport, and it need not be a precise contour. It may not need to be one that is adjusted to the traffic every year but some person who goes there to buy a house or put a house in a residential area needs to have his petition, his plat, compared with that contour and a yes/no position could be developed relatively early in that planning exercise.

That is the problem. I will say it once more. All airports have a potential noise problem, period.

MS. SEARLE: I have a quick question for Jeff Hamiel and maybe Gordon would want to comment after. Do you feel at Minneapolis that the increased traffic, promoted primarily by regulatory reform, is a concern to you noise-wise and is it something that would lead you to want to discourage CAB approval let's say of multiple route awards for CAB approval of routes that would lead to additional traffic? Do you share the same concern to that point that Gordon does?

MR. HAMIEL: Yes, I do. There is just no way to get around it if you are going to increase your airline or air carrier activity by twenty percent and therefore approximately twenty percent of your total utilization of runways. Over a populated city like Minneapolis, you have got a problem. We did not recognize the problem existed for probably the first four or five months of the year because of the relatively elaborate runway rehabilitation program that was going on and the reshouldering. We attributed the increased complaints -- people calling up and saying, "There are more airplanes; why?" We said that it was because one of the two parallel runways was closed and there was more traffic on the other parallel runway and, as a result, there was the traffic. But after looking at the consolidated schedule, we are taking a closer look now, Lucie. No.

MS. SEARLE: I am interested in the balance here -- I am a great believer in regulatory reform. I think it has done great things for the consumer, for the flying public -- and how you balance that against the interest of airport neighbors. I think Gordon is worried about that in California.

MR. MILLER: Yes.

MS. SEARLE: And when you remember that it takes a doubling of operations to increase noise by three decibels --

MR. HAMIEL: I would not make that statement in my community because I would be shot right out of the water. I think I share the same view that Gordon has basically, and that is -- Let me say one thing, and that is if deregulation is on the increase now, it is a reaction type of a situation at the present time. Many of the companies are feeling their muscles and testing the water. That is going to settle down. It may take a year, it may take two years, but it is going to settle down.

However, our attitude right now is that we are not going to change CAB's philosophy. Deregulation tied to environment is here. San Diego, San Francisco very shortly has felt the blunt of any kind of action a proprietor has taken and so our philosophy now is to discourage the stuff that really hurts us, which is the flight time activity like my story about Ozark, and see what happens.

It is a tough thing to do, to sit there and watch it happen but what else can you do at this point?

MR. DUFFY: One aspect of that is now it affects general aviation more than anything else. A case that has gone on at Love Field in Dallas, which has been essentially a general aviation airport except for one small

airline, suddenly a lot of airlines want to fly in there from Miami, New Orleans straight into Love Field. A Federal judge has ruled -- and of course, there are several suits on this -- that about the only judgment that the CAB can use any more is the fitness of an airline to carry passengers. Local noise, local environment, local desires are not in it, frankly, and you are just sort of stuck with what you get. And what you do, you take Jeff's approach and try to deal with it after you get it.

MR. MILLER: We have had an indication though from the CAB that they are working hard to try to devise some way to -- they are primarily concerned with discrimination at San Diego and at Burbank. At each of these places there was an ordinance developed that would keep out new air carriers and those drew letters right away back from the FAA and the CAB. The Burbank manager got about a twelve-page letter from their economist describing in theory a system of allocating noise.

Their contention is that you cannot discriminate against an airline that wants to come in. You have to find some way to let him have equal access to the airport that the incumbents have. So in effect what you are saying, you are going to have to take something away from the guys there in order to give part of it at least to someone who wants to come in, and immediately you see all kinds of problems here. An airport has all kinds of contracts with the incumbent airlines.

But we have heard last week that the CAB does have a special committee and a report is due to come out soon and we are eagerly awaiting that. It is hard for us to imagine that it is really going to solve things but it may point the direction of some way that the airport can deal with the additional flights and at the same time satisfy the requirements of not being discriminatory.

A curfew is one thing to help keep out the night flights but our major airports are running into problems there too. San Diego again, they imposed a nighttime curfew on themselves. In our last waiver or variance under our noise standards we asked them to extend that one hour on each end. They declined to do that, took us to court, and the Federal court judge said that the state could not impose that kind of restriction. The airport operator himself could. He could extend the curfew as long as he did not interfere unduly with interstate commerce but we, as a state, could not tell him to do that.

So, we have got an interesting set of things that need to be done and Federal policies to deal with that make it a little bit unclear how we are going to get from here to there.

DR. BRAGDON: Okay, Joe?

MR. LEWIS: Joe Lewis, Town of Hempstead. I would just like to make a statement. I have been to many conferences of the FAA and the EPA and the Port Authority and everything else and I think this is the best one. I think we have accomplished a lot here these few days.

One of the things I think has been brought home to everybody is that all people involved in a decision have to be in on that decision making at the beginning, at day one. You cannot start with say the airport operator and the FAA and then bring in the public or the carriers or what have you. Everybody has got to be in from day one.

Another thing I think was brought out here is that, unfortunately, in the weight and balances the dollar sign has too much weight. We have got to equalize that somehow. How? I don't know.

And the third thing is that I hope that this type of a conference will be held more often by the EPA and I think John Schettino and Bill Sperry and Cliff Bragdon and the others involved in this ought to be given a big round of thanks for pulling this off, because I think they did one hell of a job.

And finally, I would like to put into the record a quote from someone who when I was in school -- which I am not going to tell you how many years ago -- appeared and spoke to us and I think this quote is very befitting of the things we have been talking about here, and it is:

"Concern for man himself and his fate must always form the chief interest of all technical endeavor. Never forget this in the midst of your diagrams and equations."

That was said by Albert Einstein and I think if we remember that, it will be good advice to all of us.

MR. MILLER: I think if I can make one more point -- I agree with what Joe said. I think we have had a very good dialogue here. One of the things I find most irritating is to hear people on either side of the discussion implying bad faith to the person on the other side. I find myself thinking that way at times and it is hard to keep in mind that the other guy probably has some very good reason for the way he feels the way he does and he is probably just as honest as you are and had just as good intentions as you have. And any time you slip away from thinking like that, I think the conversation is going downhill.

DR. BRAGDON: Any other comments?

MR. JAMES HAHNE: Just a personal comment. My name is James Hahne. I am with the EPA in San Francisco and I have been sitting here through the whole session -- I have not said a word. I have talked to a lot of people and one of the objects of this meeting was to try to come up with some answers on these problems -- and we have discussed many aspects of the problem.

I have kept a record. Other than the word "promulgation" and the phrase "technically feasible and economically reasonable" there were two other words that came up consistently out of some thirty-eight speakers and panelists. Thirty of them mentioned communications and education and of all the people that I talked to individually, my first question or second question was: Out of this conference, what was the one thing that you think is needed for the next conference?

And those two words always came up, communication and education. This is where we obviously need some more work and I would hope to think that the conference would keep that in mind and try to come up with some ideas -- constructive, whatever -- in that vein of thought. Thank you. That is all.

DR. BRAGDON: All right, any other comments?

I have some summary remarks but I want to give everybody an opportunity to put their words into the record. There are not many left.

I will summarize this by saying that I think first of all the appreciation of the support we have received is mutually shared by a lot of people. The conference itself is based on the enthusiasm of the people and I think I have seen considerable dedication on everyone's part to participate, to try to learn about something they did not know about. I think that is the first thing that is important.

The most difficult thing I have ever found is to recognize the fact that I may not know something and the people in this room today and the people who have been here for three days have given that time to determine the fact that they want to learn about something they do not really know about -- and that is the most important step I think that we can take in any meeting, and I have learned considerable. I would say my level of knowledge has gone up to a very significant level and hope everybody can say that to some extent. So, I think that is the first point.

The second is that we have established some communication and that communication, interesting enough, has been reflected in a variety of different ways. One is that a lot of jargon which we could have thrown around has been generally kept to a lower level, although we have come up with a lot of words that our reporter has not been able to understand and I think she has a better perception than anyone here of what this conference means. She should be giving the wrapup. She has done an excellent job, I might add.

From this standpoint we have attempted to communicate in a language none of us have ever used or have rarely used because we have been in our own interdisciplinary areas and I think that is the second step -- the enthusiasm and the second is the ability to communicate with other people.

The third point is that I think a dialogue has been established. Various people have said we need to get together in different ways. The sharing of information I think is a key to what we have done in this meeting. If nothing else, we have allowed the opportunity to share experiences, but also to start sharing physical information. Without that physical information we are not going to get any further down the road than we are. That means the real estate interests, the planning interests, the engineers' interests, the regulators' interests, everybody's interest -- and I hope we can establish that process.

In terms of findings, just to highlight a couple of things I think are sort of important; one is we have looked at the issue of technology and, unlike the commercial aircraft, it looks like G.A. technology, interestingly

enough in several areas is coming in below what a standard is, rather than to meet a standard -- in some areas. So I think that is one thing that is certainly constructive in terms of the manufacturing side.

The increase of growth, of deregulation is going to have a very significant impact, as was mentioned earlier. The number of G.A. airports or the decrease in the number of commercial carriers, and the role of G.A. aircraft is going to increase as opposed to the status quo in the future.

The question of impact -- I think that one has been addressed, it has been skirted around but certainly raises some basic questions but maybe we do not have the right descriptor to determine what impact does exist at airports. The gentleman from the Grand Canyon, talking about wilderness areas in general aviation to Chagrin Falls, Ohio, talking about a very small number of operations, to Torrance, California, one of the largest G.A. airports. So, we are talking about different scales, possibly different levels of impact that we all must address to represent and protect the interests of the public and the economic base of our communities.

The concern of descriptors of impact from the health as well as economic standpoint, the real estate interests have determined to a great extent the economy essentially determines or the market essentially assesses the impact and reflects that impact in terms of price. The concern there of course is if you do not integrate health effects into the economy then the real estate industry has no way of discounting that factor -- and I think that is one thing we all must look at, is the quantitative basis of the health impacts in terms of economic disability -- something that we as a professional group must translate to the real estate industry as a factor in terms of what quote is a market. Because I think my opinion is that the market is not totally sensitive to the impact in terms of the population at the present time. But that is a failure of communication.

Another factor is that noise has been a technical area. It was interesting to hear today that when somebody was talking about planning around airports being done in a very isolated way, and yet we think about public participation. But evidently we are not participating at the level of all parties which are involved in the planning. So as we talked about the first day, the matrix I discussed, we all think we are doing planning but we are going down one avenue and we are not looking from our left to right. Obviously, this is something we must continue to do and improve upon it.

There is an interesting question of the census of information. The people in this room probably have a greater sensitivity of what the problems are but we do not know the scale of the problems we are dealing with. We do not know the number of airports, nor do we know their demographic or geographic distributions, nor do we know the population being affected or potentially impacted. We know there is a potential problem but the magnitude of scale is not known. I think that census of impact and concern is something we must address before we go on.

The role of the regulatory process has been mentioned and the use of other techniques to accommodate or to compliment the regulator process is one that looks to me has a lot to offer. The experiences of Torrance and other

communities to try to use a softer sell than the regulatory process. The pilots' cooperation and working with that seems to me to be a complementary role that is extremely important.

Those are some of the observations that I have had. I guess the last one in terms of this process is the politician and we feel I think as a collective group that greater communication is necessary and the role of the politician being a person representing a compromise situation is something we must deal with. Give them the tools to help them make decisions but not to the point that the politician works his way out or her way out of the decision, but to assist them in making a rational decision -- which gets down to the question of accountability. And all of us are involved or should be involved in the accountability process. I think that is really where we have to play a role in the future.

The second factor in the future I think is how we develop some informational base for communication. I have received probably fifteen to twenty items that people want to get to other people and I think that is something that we need to look at in the future. I would encourage that and I hope that EPA would pick up on this, and not only EPA but also work with the FAA to insure that there is communication at the Federal level, but then get the private sector folks involved. Lyndall Hughes, sitting here in an audience which is totally foreign to him for three days and yet being the person who is here at the end of that conference indicates cooperation and interest on his part -- GAMA and other groups.

I think what we need to do, hopefully, is to establish a team, collective team that will work toward resolution of this and hopefully a conference of this type would be continued in future forms with a certain schedule of activities.

At this time I would like to turn this over to the comments of anybody from the EPA if they have any comments to add.

I would like to thank Jim Reese and Randy Barnes, two of my graduate students, who worked extremely hard. They are not right here, but are packaging materials on the floor below. Also, I would like to thank Bill Cleary and Judy Beaver and our court reporter for the fine job she has done. It would be my hope that what we have done today and these past two days could continue. And it is up to everybody in this room to have that process continue through your effort of advocacy.

At this time, if EPA has any remarks, I just hope they would be supportive of the types of things we have had for this time period.

MR. ELKINS: Well, let us just say we, obviously, do appreciate all of your participation. I think the conference from our point of view has far exceeded our expectations. We were rather hesitant, quite frankly, at going into this because it was somewhat unknown and unstructured compared to most of the things we get into.

If you have any suggestions, either anonymous or signed, that you would like to send to us about how the conference could have gone better,

please do so while it is fresh in your memory, so that we can find a way to sponsor similar conferences ourselves next year or can find other sponsors to go with us. I think one group that I would seek very hard to try to go with us, if we were able to participate again, would be the FAA. I have missed John Wesler's attendance here and his colleagues equally with EPA. I think we have failed somewhat to get them as much involved as I would have liked to have seen. Although they were here, supportive of the conference, I would like to have their money and other participation too. But I think equally so, the private sector, if you have suggestions on what we might do to continue the communication during the year and in years to come, we welcome those as well.

MR. LEWIS: Chuck, I suggest the next one be held in Hawaii.

DR. BRAGDON: At this time, other than those remarks which I certainly endorse, we will call the conference closed and thank you for your attendance and time.

GLOSSARY

- Agency, 31 (Searle)
- Atlanta Regional Commission, 76 (Doyle)
- ADAP (Airport Development Assistance Program), 31 (Searle), 79 (Tyler), 150 (Blair)
- AICUZ (Air Installations Compatible Use Zones) (see Land use)
- Air carriers and general aviation traffic (see Air traffic)
- Aircraft certification, 28 (Searle), 160 (Green)
- Aircraft manufacturers (see GAMA, Engines)
- Aircraft mix in general aviation fleet (see General aviation)
- Aircraft noise (see Noise, General aviation, Engines, Aircraft operating procedures, Airport operating procedures)
- Aircraft operating procedures, 10 (Elkins), 198-202 (Green), 203-207 (Elmgren)
- best angle/rate of climb, 105-106 (Jackson), 137 (Critchfield), 205-207 (Elmgren)
 - pilot cooperation, 101, 135, 137 (Critchfield), 136-137 (Campanella, Critchfield), 154 (Gammon)
 - traffic patterns (see Airport operating procedures)
 - thrust control, 84-86 (Delino, Green, Tyler), 195 (Green)
- Airport benefits (see Economic impact)

Airport - Community negotiation, communication, and cooperation, 60-61
(Caldwell), 91-92 (Goodfriend), 111-112 (Eschweiler), 154-155 (Gammon)

compromise, 250-251 (Duffy)

Airport master-plan, 62-63 (Caldwell), 68-69 (Campanella), 90 (Goodfriend),
116 (Eschweiler)

Airport operating procedures, 11 (Elkins), 29 (Searle), 60-63 (Caldwell), 91
(Goodfriend), 94-98 (Critchfield), 153-156 (Gammon), 203-204
(Elmgren), 227-233 (Collins), 239-240 (Hamiel)

engine run-up, 29 (Searle), 61 (Caldwell), 227-228 (Collins), 241,
243 (Hamiel)

flight curfews, 29 (Searle), 60 (Caldwell), 203 (Elmgren), 239-241
(Hamiel)

maintenance curfews, 228-229 (Collins)

noise monitoring system, 22 (Wesler), 97, 101 (Critchfield), 103
(Jackson), 204 (Elmgren), 232-233 (Collins), 249-250 (Miller)

noise advisories and air traffic control, 20-21, 23 (Wesler), 29
(Searle), 97-98 (Critchfield), 207 (Elmgren)

traffic patterns, 228-229 (Collins)

traffic restrictions, 240 (Hamiel)

Airport penalties (see Economic impact)

Airport policy board (see Planning board)

Airport-proprietor

options available (also see Airport operating procedures, Land acquisition), 89-93 (Goodfriend)

responsibility, 21, 24 (Wesler), 107 (Jackson), 132 (Procunier), 153-156 (Gammon)

Airport, reliever (see Reliever airports)

Airports, effects on property values (see Economic impact)

Air traffic

air carriers and general aviation, 9 (Elkins), 37 (Doyle), 110 (Jackson), 238 (Hamiel)

densities, 53 (McMarty)

noise advisories (see Airport operating procedures) patterns (see Airport operating procedures)

restrictions (see Airport operations procedures)

ATA (Air Transport Association)

reduction to climb thrust (see Aircraft operating procedures, thrust)

Aviation noise abatement (see Aircraft operating procedures, Airport operating procedures, Engines)

Aviation easements, 72-73 (Swing, Wesler, Grindie) 95 (Critchfield), 127-128, 129 (Tyler, Clark), 230 (Collins), 252 (Duffy)

Business aircraft (see General Aviation)

Business aircraft as a contributor to general aviation noise, 28-29 (Searle),
200-201 (Green)

California, 157-158 (Miller)

CEQ (Council on Environmental Quality), 87 (Goodfriend) City Council of
Torrance, 97 (Critchfield)

Civil aircraft (see General Aviation)

Clear-zone, 25 (Wesler)

Climb, best angle of (see Aircraft operating procedures)

Communication, importance of in disputes, 62-63 (Caldwell), 97 (Critchfield)

Community development, 109 (Jackson)

Community noise control, 89-93 (Goodfriend)

Community response, 90 (Goodfriend), 106 (Jackson)

Compatible land use (see Land use)

Compromise in airport-community negotiation (see Airport-community negotiation,
communications, and cooperation)

Curfews (see Airport operating procedures)

Decision-matrix technique, 12-17 (Bragdon)

Defense Noise policy (see Land use)

Deregulation, 36 (Doyle), 187 (Scott), 239-240 (Hamiel) 249 (Miller), 256
(Searle, Hamiel, Duffy, Miller)

Economic impact

benefits of airports, 30 (Searle), 39, 44 (Doyle), 55-57 (McMarty),
184-193 (Scott), 217-218 (Clark, Scott)

effects of noise, 215-216 (Diaz)

penalties of airports, 57 (McMarty), 58 (Lewis)

Engines

Cost of design, 166, 199 (Green)

design for noise abatement, 166, 196 (Green)

propeller technology, 27 (Searle), 104-105 (Jackson), 125
(Critchfield), 163-166 (Searle, Green), 174 (Campenella), 195-196
(Green)

run-up (see Airport operating procedures)

time-lag in design, 166 (Green)

Turbojet and turbofan technology, 51 (Galloway), 196 (Green)

EPA (Environmental Protection Agency)

function in control of general aviation noise, 5 (Elkins), 144
(Green), 172 (Goodfriend), 175, 193 (Green)

function in relation to function of FAA, 5 (Elkins), 35 (Searle), 124
(Eschweiler), 166-171 (Green, Schettino, Elkins)

EPA levels document, 144 (Green), 171 (Elkins), 225 (Schettino)

FAA (Federal Aviation Administration), 6 (Elkins), 18-21 (Wesler), 43 (Doyle), 149-150 (Blair), 156 (Bragdon, Blair)

FAR (Federal Aviation Regulation), 22, 23 (Wesler), 48 (Searle-Galloway), 50 (Galloway), 174 (Campanella), 176 (Tyler), 195 (Green)

Federal function in noise control (also see EPA, FAA), 15 (Bragdon), 210 (Vernor)

FHA (Federal Housing Administration), 68 (Campanella), 124 (Jansen), 214 (Love)

Fleet noise levels, 51 (Galloway), 195 (Green)

Flight curfews (see Airport operating procedures)

Fuel consumption and noise, 83-84 (Wesler), 84, 160-161 (Green)

GAMA (General Aviation Manufacturers Association), 194, 198 (Green)

General Aviation

air carrier traffic (see Air traffic)

business aircraft, 28 (Searle), 52-57 (McMarty), 200 (Green)

fleet, 9 (Elkins), 18-19 (Wesler), 49 (Galloway), 52 (McMarty), 124 (Galloway)

growth, 19 (Wesler), 200 (Green)

noise, importance of, 10 (Elkins), 36, 37 (Doyle), 127-128 (Tyler), 162 (Lewis, Gosnell), 200-202 (Green), 255-256 (Thompson, Campanella)

Greater Boston Regional Commission, 31 (Searle)

Handbook for Developing Noise Exposure Contours for General Aviation Airports,
123 (Borthwick)

Health and welfare, 8 (Elkins), 73 (Esler, Swing), 74 (Schettino), 172
(Goodfriend)

HUD (Housing and Urban Development) 16 (Bragdon), 68 (Campanella), 94
(Critchfield), 124 (Jansen), 214 (Love)

ICAO (International Civil Aviation Organization), 197 (Green)

ILS (Instrument Landing System) 26-27 (Searle), 34 (Tyler), 68 (Campanella)

Kansas City International Airport District, 43, 75 (Doyle)

Land acquisition, 33 (Searle), 76 (Doyle), 90 (Goodfriend), 229-230, 231
(Collins)

Land development, 109 (Jackson) 152 (Gosnell), 162 (Gosnell), 178 (Forbes),
212 (Hughes)

Land use, 29 (Searle), AICUZ, 233-237 (Metcalf)

control, 11 (Elkins), 29, 33 (Searle), 80 (Elkins)

Airports Guide to Compatible Land Use Planning Near, 30 (Searle)

planning, 75-80 (Goodfriend, Doyle, Bragdon, Grindle, Wesler, Tyler),
127-129 (Tyler, Eschweiler, Clark)

restriction, 126 (Critchfield), 141 (Barnard)

study, 71 (Tyler)

Legal action, 111 (Eschweiler)

Levels document (see EPA levels document)

Litigation, important results of, 21-22 (Wesler), 50 (Galloway), 153 (Gosnell), 231-232 (Collins)

Los Angeles, 227-233 (Collins)

Maintenance curfews (see Airport Operating Procedures)

Maryland

Environmental Noise Impact Act, 146 (Montgomery)

Metropolitan Airport Commission (Minneapolis), 76 (Doyle)

Military aviation (see Land use)

NASA (National Aviation and Space Administration), 74 (Galloway), 164 (Searle)

National Business Aircraft Association (NBAA), 29 (Searle), 154 (Gammon)

Night maintenance (see Airport operating procedures)

Noise abatement plan, 59-60 (Caldwell), 95-99 (Critchfield), 145-148 (Montgomery), 154-156 (Gammon), 228-232 (Collins), 238-245 (Hamiel)

abatement training, 23 (Critchfield)

advisories, (see Airport, operating procedures)

business jet fleet, 28 (Searle)

complaint, 89 (Goodfriend), 97 (Critchfield), 154 (Gammon)

control matrix (see Decision-matrix techniques)

control strategy (see Aircraft operating procedures, Airport operating procedures, Land use, Planning)

descriptors, 33 (Searle), 35 (Tyler), 48-49 (Galloway), 89 (Goodfriend), 253 (Braslau)

disclosure, 183 (Swing), 209 (Vernor), 219-224 (Tyler, Hughes, Scott, Bragdon, Lewis, Searle, Love), 254 (Braslau)

measurements of aircraft in general aviation fleet 46-47 (Galloway)

moderate levels in low ambient levels, 74 (Galloway), 175 (Green)

problem identification, 88 (Goodfriend) 95, 96 (Critchfield), 251-252 (Duffy)

safety, 39 (Doyle)

standards, 33 (Searle), 35 (Tyler), 125-126 (Delino, Galloway, Jackson), 160 (Green), 200 (Green), 247 (Miller)

as a design parameter, 83 (Elkins), 84-85, 196-197 (Green)

Noise Control Act of 1979 (also see Quiet Communities Act), 5 (Elkins), 145 (Green), 166 (Schettino)

Orange County Planning Commission, 67 (Grindle)

Party involvement (see Planning)

Pilot cooperation (see Aircraft operating procedures)

Pilot operating handbook, 198 (Green)

Piloting techniques (see Aircraft operating procedures)

Planning (also see Land use)

causes for failure in implementation, 67 (Grindle), 90 (Goodfriend),
107-108, 111 (Jackson), 130 (Caldwell), 141 (Barnard), 182-183
(Thompson, Forbes), 212 (Hughes), 249 (Miller)

community, 69 (Swing)

developers in, 109 (Jackson), 177-180 (Forbes), 212 (Hughes)

party involvement in, 33-34, 45-46 (Doyle), 122 (Miller)

regional, 209 (Searle), 40-41 (Doyle), 114 (Eschweiler)

time for implementation, 121 (Critchfield)

Planning board, 90 (Goodfriend), 158 (Miller)

Atlanta Regional Commission, 76 (Doyle)

City Council of Torrance, 97 (Critchfield)

City of Los Angeles Planning Department, 227 (Collins)

Greater Boston Regional Agency, 31 (Searle)

Kansas City International Airport District, 43, 76 (Doyle)

Metropolitan Airport Commission (Minneapolis), 76 (Doyle), 237
(Haniel)

Orange County Planning Commission, 67 (Grindle)

San Francisco, 76 (Doyle)

Political decisions, factors in, 29 (Searle) 67 (Grindle), 90 (Goodfriend),
130 (Critchfield), 132-134 (Grindle, Delino), 136 (Critchfield), 173
(Barnard), 250 (Duffy)

Preventative measures, 10 (Elkins), 104 (Jackson), 153-154 (Gammon), 162
(Lewis)

Propeller technology (see Engines)

Property value (see Economic impact)

Public awareness, 30 (Searle), 42, 45 (Doyle), 63, 64 (Caldwell, 91
(Goodfriend), 95 (Critchfield), 104, 106, (Jackson), 124 (Eschweiler),
(Lewis), 154 (Gammon), 227-228 (Collins), 244 (Hamiel), 259 (Bragdon)

Quiet Communities Act (also see Noise Control Act of 1972), 6 (Elkins)

Real estate appraisal, 184-193 (Scott)

Real estate developer, 30 (Searle), 181 (Forbes), 212 (Hughes)

Real estate developer, function of in planning (see Planning)

Regional planning (see Planning)

Regulations, 142 (Green), 154 (Gammon), 194 (Green), 249 (Miller)

Los Angeles noise control, 233 (Collins)

Zoning, 90 (Goodfriend), 93 (Goodfriend), 108 (Jackson), 129 (Clark),
130 (Caldwell, Eschweiler), 141 (Barnard), 152 (Gosnell), 157
(Montgomery), 222 (Scott), 235-236 (Metcalfe)

Reliever airports, 71 (Tyler), 242 (Hamiel)

San Francisco jurisdiction, 76 (Doyle)

Santa Monica (see Airport operating procedures, Litigation)

Sound-insulated construction, 126 (Critchfield), 135 (Lewis)

Source control, 11 (Elkins), 27 (Searle)

State-level effort, 145-147 (Montgomery), 157-159 (Miller), 230 (Collins),
247 (Miller)

Tax incentive, 209 (Vernor)

Torrance, 94-99 (Critchfield), 203-208 (Elmgren)

Touch and go, 39 (Doyle), 59-60 (Caldwell), 89 (Goodfriend), 97 (Critchfield),
174 (Campanella), 204 (Elmgren)

Town-county cooperation, 115-119 (Eschweiler), 131 (Goodfriend) 242 (Hamiel),
254 (Braslau)

Transient population, method of contracting, 64 (Caldwell)

Turbofan technology (see Engines)

Turbojet technology (see Engines)

Turboprop technology (see Engines)

Zoning regulations (see Regulations)

United States
Environmental Protection
Agency
ANR-471

Official Business
Penalty for Private Use
\$300

Washington, D.C. 20460

SPECIAL FOURTH CLASS RATE BOOK