ACTION

	DATE
COMMITTEE _____	___
M.A.P.C. Receive File 7-16-81 to be brought back to MAPC	
B.C.C./B. CO. C._____	___
MAPC _____	___

DR 81-18 - McConnell Air Force Base 1981 Amended AICUZ Release (Air Installation Compatible Use Zone).

WICHITA-SEDGWICK COUNTY

METROPOLITAN AREA PLANNING DEPARTMENT

DATE August 9, 1978

TO Willard L. Stockwell, Chief Planner, Advance Plans Division

FROM Art Chambers, Planning Analyst, Advance Plans Division

SUBJECT USAF AICUZ REPORT--McConnell AFB

I have reviewed the AICUZ Report released last month by McConnell AFB, and would offer the following comments and observations. This report was prepared to improve relations and cooperation between McConnell AFB and surrounding communities. The Air Force wishes to minimize encroachment of incompatable land uses on the air base. In addition the Air Force wishes to reduce the number of complaints resulting from aircraft operations. To accomplish these goals, they established Compatable Use Districts (CUDs) based upon recommended land uses for varying levels of noise and accident potential. See pages IV-5 through IV-13 for a listing of types of land use recommended for each CUD.

Using the Accident Potential Zones (APZs) and noise contours, defined in the AICUZ report, three areas can be identified:

1. Clear zones and APZs 1 and 2.
2. The area described in number 1 above, and the area encompassed by noise contour 75 Ldn.
3. The area between the 75 Ldn contour and the 65 Ldn contour.

These areas represent cumulative levels of land use restrictions based upon accident potential and noise levels. Level one is the most restrictive, while there are only mild restrictions recommended for level three. Decisions by the city or county relating to the recommendations of the AICUZ report will probably have a better chance of being effectively implemented in the clear zones and APZs (Level 1).

Although the report recommends that some action, preferably formal, be taken by the affected cities and county it may be difficult, if not impossible, to do so. While the "ideal"

solution would be to solve the problem on a comprehensive basis, i.e. Airport Zoning Ordinance, it may not be feasible due to economic and political considerations. Therefore, some alternative must be selected that has a high degree of acceptability to McConnell AFB, the development community, the City Commission, the County Commission and potential land owners in the McConnell area.

The following is a list of possible actions that could be taken by the City and/or County. Some of the actions may be acceptable individually but unacceptable when combined with other methods.

1. Use the AICUZ report either informally or formally when reviewing rezoning cases and subdivision applications. Formally the Planning Commission could adopt a policy statement that would direct staff to use the AICUZ report when reviewing and commenting on rezoning cases and subdivision applications.

2. Enact a Fair Disclosure Ordinance that would further alert potential buyers to the accident and noise problems of the area.

3. Expand the use of avigational easements by requiring the developer to dedicate the easements to the City as a condition for approval of the final plat.

4. Update the existing Airport Zoning Ordinance. At a minimum this should be done to incorporate new standards as set forth in the AICUZ Report and other sources. At the same time regulations dealing with noise and accident potential could be added.

5. The building code could be amended to include standards designed to reduce interior noise levels (See Appendix F.). These new standards would have to be related in some manner to either zoning ordinances or subdivision regulations. There may be a problem defending the new standards, if challenged, using the existing zoning ordinances and subdivision regulations.

6. Zone undeveloped land around McConnell to a compatable use. Then, if developers wished to rezone, an additional step would be available for the staff and Planning Commission to review the proposed development. This may work best to the south and west of McConnell. Additionally, this zoning could be done in phases such as in the APZs, within the 75 Ldn contour or within the 65 Ldn contour.

7. Develop some form of a comprehensive Airports and Environs Zoning Ordinance. If not politically feasible, some modified form might be possible if it was not too broad in its scope.

Comments

The land area encompassed by the AICUZ report extends roughly from Kellogg south to the northern limits of Derby and from east of Webb Road to Clifton (See attached map). The primary land use conflicts are already existing to the north and west. Future land use conflicts occur to the immediate north (within APZ 1) and to the west (partially within the 75 Ldn contour). These conflicts should not cause any large problems since the existing zoning is industrial. To the east and to the south most of the land is currently being used for agricultural purposes. Projected future land use to the south and east is shown to remain agricultural. Future residential and commercial land use around McConnell, where it encroaches on the 75 Ldn contour, should be evaluated to resolve any problems that could adversely affect McConnell or the property owners. In the future this would also apply to new growth in northern Derby.

The AICUZ Report states that the noise contours are dynamic and should not be used as district boundaries. This could create problems in establishing guidelines and/or regulations based on noise. Likewise, whatever is done using the AICUZ noise contours may be totally irrelevant if the mission, operations and/or aircraft are changed at McConnell. Therefore any action, such as ordinances or regulations, should be drafted to be as flexible as possible.

When analyzing the possible courses of action, the possibility of using the same course of action at McConnell AFB, Mid-Continent, Beech and Comotara Airports should be examined. Information concerning noise generation at Mid-Continent Airport should be available sometime this year or early next year as a part of their current Master Plan update efforts.

Is the noise/computer program available?

Recommendations

1. Incorporate the AICUZ Report into the review process for rezoning cases and subdivision applications. Preferably this would be done by direction of the Planning Commission.

2. Additional protection for McConnell can be gained by formalizing the use of avigational easements and updating the current Airport Hazard Zoning Ordinance.

3. The possibility of enacting a Fair Disclosure Ordinance should be investigated.

4. An examination of including the AICUZ recommendations into the building code should be made.

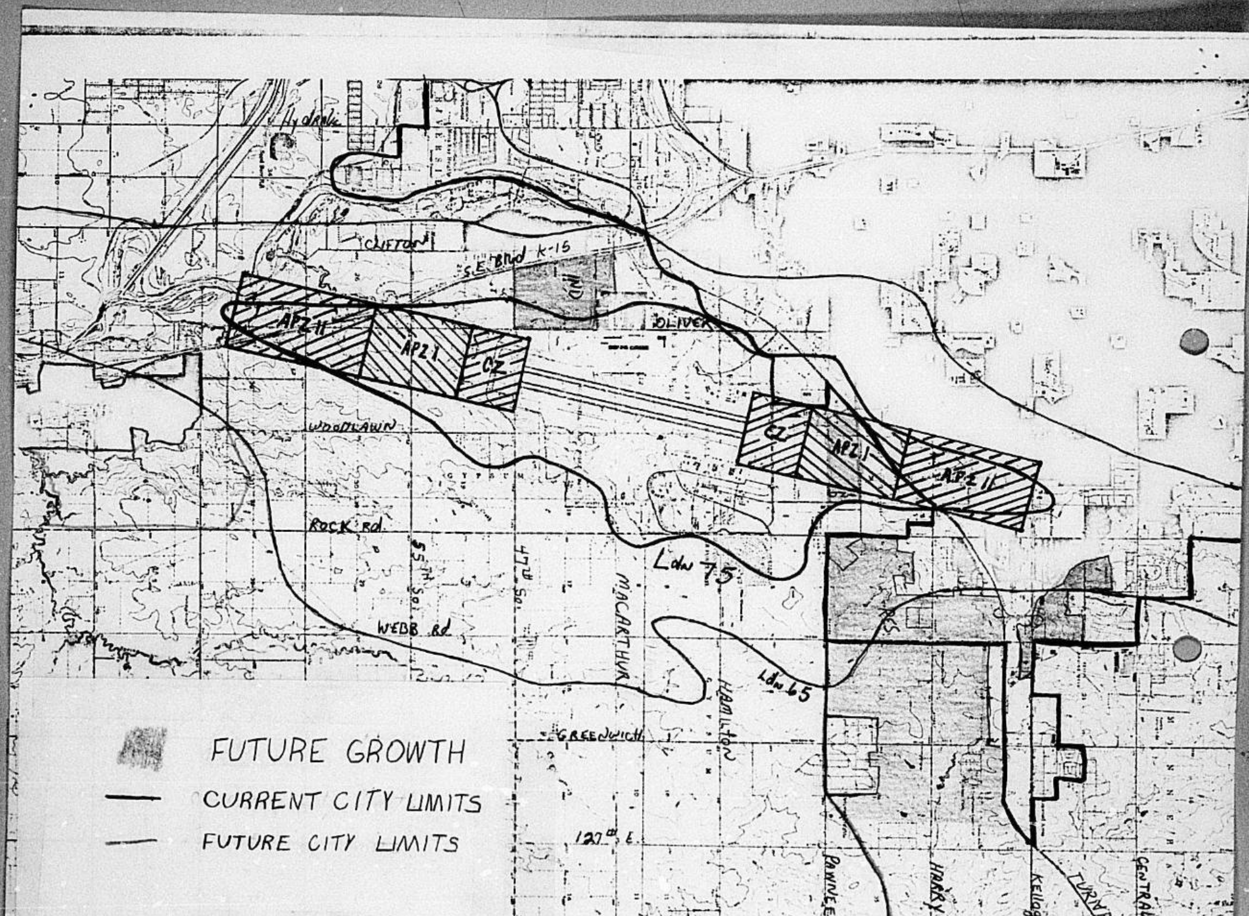
This memo is the result of a preliminary review of the AICUZ Report. The comments and recommendations relate to the more significant issues as I discerned them in my review. Before pursuing this further, I would appreciate the opportunity to discuss possible direction(s) I might take with you and/or other interested staff.

Arthur D. Chambers

Art Chambers
Planning Analyst
Advance Plans Division

AC:ch
cc Bruce A. Curfman, Senior Planner, Advance Plans Division
Darrell W. Butler, Senior Planner, Advance Plans Division
Joseph L. Forinash, Principal Planner, Advance Plans Division

- C/C tie'
- Bd of Realtors - Disclosure ord ?
- WAHB - Re code - Read letter.


Hydraulic
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WEBB Rd
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MACARTHUR
Ldn 75
Ldn 65
HAMILTON
GREENWICH
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PAWNEE
HARRY
KELLOGG
TURNPIKE
CENTRAL
FUTURE GROWTH
CURRENT CITY LIMITS
FUTURE CITY LIMITS

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 381ST STRATEGIC MISSILE WING (SAC)
MCCONNELL AIR FORCE BASE, KANSAS 67221

RECEIVED
MAY 22 1981
METROPOLITAN PLANNING
ROUTE ☐ _____
☐ _____

21 May 1981

Mr. Robert A. Lakin, Director
Sedgwick County Planning Department
City Hall, 10th Floor
455 North Main
Wichita, Kansas 67202

Dear Mr. Laken

Maintaining a harmonious relationship with surrounding civilian communities receives a high priority at all Air Force Bases. McConnell is no exception, and I feel we and the Air Capital community have been able to cooperate with one another in the past years in all areas. I am sure our future associations will prove no different.

The Air Force is very much concerned with the impact of its flying operations in terms of noise and accident potential on areas surrounding the base. In that connection, McConnell released in 1978 the McConnell Air Force Base Air Installation Compatible Use Zone (AICUZ) study. The AICUZ study provided findings and recommendations suitable for incorporation into the local land use planning and control process.

Subsequent to the study's initial release in 1978, the Kansas Air National Guard (KSANG) located at McConnell, transitioned from F-105 to F-4 aircraft. Additionally, the KC-135 flight manual was amended to include new departure climb-out procedures. This prompted us to conduct another study.

As a result, we have updated and revised our AICUZ program to reflect this change and its effect on the community.

You are cordially invited to attend a pre-AICUZ release meeting May 26 at 2 p.m. in the lower auditorium of the Fourth Financial Center for presentation of our revised AICUZ program. McConnell and Kansas Air National Guard officials will host the meeting and hopefully answer any remaining questions you may have. A public meeting to release the study will be held May 27 at 2 p.m. in the Fourth Financial Center; we solicit your support and presence at that meeting as well.

Your support and cooperation in this matter will be appreciated as the Air Force is committed to achieving and maintaining compatible land use in the vicinity of McConnell Air Force Base through the cooperative AICUZ program. I will look forward to seeing you on the 26th of May.

Sincerely

Elmer T. Brooks

ELMER T. BROOKS, Brigadier General, USAF
Commander

Want 20 copies of final report.

Peace . . . . is our Profession

THE AIR INSTALLATION COMPATIBLE USE ZONE

PROGRAM AT
MCCONNELL AFB

The Air Installation Compatible Use Zone program has been designed to achieve compatibility between installations and neighboring communities by means of a compatible land use planning and control process carried out through appropriate legislation at the state and local level. Here is how McConnell AFB is carrying out its program.

Environmental management is one of our most serious national concerns. The Air Force is actively involved. Problems of airfield encroachment, noise pollution, socio-economic relationships and environmental impact have required the Air Force to intensify its involvement and participation in comprehensive community and land use planning at the local level, and in intergovernmental coordination at the regional, state and federal levels.

We have found that, unless we engage in coordinated planning which bridges the gap between the federal government and the local citizen, we may be forced to curtail, delay or even stop our aviation activities because of litigation or controversy. This issue is coexistence between an air installation and the adjacent community.

As part of our overall Air Force environmental and community planning effort, the Air Force developed - and the Department of Defense established - AICUZ, which is an acronym for Air Installation Compatible Use Zone. AICUZ, is simply a concept of achieving compatible land use in non-government areas adjacent to military airfields. For example, a low profile warehouse or storage structure near an airfield would pose no problems to military flight operations and, therefore, would constitute compatible land use. However, it doesn't take too much imagination to realize the problems that a high-rise structure would create in exactly the same location. Besides the height of structures, their use concerns us. To build a hospital or school in a high-noise and accident potential area, would not constitute compatible land use. In other words, AICUZ is a means by which we can maintain operational capability and prevent airfield encroachment, while accommodating compatible civil growth and development. It works through the public land use planning and control process.

Although this sounds relatively simple, AICUZ is a highly complex and demanding program, designed to provide a comprehensive rational basis for cooperative planning and action. The Air Force has been a leader in the subject of airfield environs land use planning since the 1950s when it first started evaluating the impact of noise around airfields; but much of the work, until recently, was of a laboratory nature. We, as well as other airport operators, know that we have a problem, and that problem is encroachment of our installations, caused by incompatible urban development. Historically, this encroachment has resulted in the reduction of mission capability, and has contributed to base closures or the elimination of flying.

We have found that no other agency has the direct responsibility of protecting Air Force bases, or for that matter, the people near our bases. Other federal agencies, such as the Environmental Protection Agency, Federal Aviation Administration, the Department of Housing and Urban Development, and Veterans Administration, are involved to one degree or another, but only the Air Force has the prime responsibility. This is also true for civilian airfields in that the responsibility rests with the airfield operator. By approaching this matter on the basis of mutual concerns, which the AICUZ does, the Air Force has a tool and the flexibility to avoid problems resulting from incompatible development. Our AICUZ objectives are quite simple. The primary objective is to maintain Air Force operational capability. A second, and equally important reason is to assist local authorities in the protection of their citizens. Since the Air Force mission is to protect the American people, it follows that we must exhibit this same concern for their protection in our daily operations. The protection and promotion of the public health, safety and welfare are addressed by AICUZ. In terms of health, we are talking about noise exposure. For safety considerations, the Air Force must be aware of aircraft accident potential to adjacent land areas as well as hazards to our operations from improper land uses. The third factor is that of the community welfare, both economic and social. Air Force basis are major industries and social centers, and as a result, are a key element of the community fabric. It is therefore necessary, in the interests of the community, to retain them.

The Air Force AICUZ program has been designed to achieve compatibility between installations and neighboring communities by means of a compatible land use planning and control process carried out through appropriate state and local legislation and intergovernmental coordination with federal agencies. This is the first time in military - or to the best of our knowledge, civil history - that a process has been developed that approaches the successful accommodation of such interests. Today's AICUZ concept developed through an evolutionary process. It started in 1971 with the Air Force "Greenbelt" program which arbitrarily designed an area around airfields for which we identified special land use considerations. In 1971, the Air Force renamed the program AICUZ and began working cooperatively with local governments. By mid 1971, the Air Force found that a simplified, arbitrary approach would not work and as a result, a methodology was developed in which noise zones and accident potential zones were designated and combined, by overlay, to create a single map of compatible use districts. Land use compatibility guidelines have been developed for each of the compatible use districts. This map, the land use compatibility guidelines, and a full analysis of the relationship between aircraft operations and adjacent land use, are published as an AICUZ study document.

AICUZ studies began at 92 Air Force bases, including McConnell AFB, Kansas in October 1973. It was a massive effort involving 10 functional areas. Data was collected on operations, weather, economics, state and local laws, operational hazards, accidents, land ownership, community development, and the relationship between the base and the community.

Our development of the Air Force AICUZ program began with a complete layout of flight paths and altitudes of aircraft operating out of McConnell AFB to get a visual display of the overall noise picture from an aerial point of view. These flight paths, combined with other operational and noise source data, created a composite set of noise zones surrounding the base.

A set of accident potential zones was created, outlining the most hazardous areas, by relating an Air Force study of the history of aircraft accidents worldwide to our facilities at McConnell AFB.

The noise zones and accident potential zones were combined to create a single map of compatible use districts. This map, used with related land use compatibility guidelines, provides basic data for planning compatible development around the McConnell AFB complex.

Nationwide, the Air Force AICUZ program is producing tangible results. Land use control ordinances based on AICUZ have already been enacted or amended around many bases. Historically, the citizens of Sedgwick County and the personnel of McConnell AFB have worked together in cooperative and harmonious efforts to better serve the needs and desires of all concerned. We have collectively found solutions which have maximized the benefits of McConnell AFB while minimizing the annoyances. If the future of McConnell AFB is to be as bright as its past, you, the citizens of Sedgwick County, will once again need to participate in the solution of our mutual concerns. We request your careful and considered review of the recommendations contained in the McConnell AFB AICUZ study. In brief, these recommendations include:

* The AICUZ study should be adopted as an official premise for future planning.

* Zoning ordinances should be adopted, or modified, to reflect the compatible land uses outlined in the AICUZ study.

* Fair disclosure ordinances should be enacted to specify disclosure to the public of those AICUZ items directly related to the McConnell AFB complex operations.

* Height control of structures near flight paths should be regulated by incorporation into zoning ordinances.

* Comprehensive plans need to be developed, or updated, to include the land use recommendations of the AICUZ study.

* Subdivision regulations should provide for compatible land use review, imposition of conditions to minimize or prevent incompatibilities, open space dedication and berm or barrier construction.

* Building codes should be amended to require structural noise attenuation for buildings to be located in the noise zones, thus expanding the range of compatible land uses.

* Capital improvement programs should be carefully reviewed to discourage incompatible land use patterns, with particular emphasis on utility extension planning.

The basic issue is coexistence between air installations and adjacent communities. The AICUZ program is an example of how the Air Force is addressing this issue. This program is not intended to be a one-time effort. As situations and conditions change, AICUZ data will be revised.

Hopefully, this brochure has been successful in conveying to you the level of the Air Force commitment to environmental quality and community planning. We are convinced that aviation facilities can be good neighbors, but only if those of us involved in aviation make the effort to cooperate with local officials and citizens to resolve mutual concerns and problems. We, the taxpayers, cannot afford the luxury of building new bases to replace those forced to close by incompatible development. McConnell AFB is a vital asset to this community, and we want to stay. With your cooperation and support, we will.

381 SMW/CC
McConnell AFB, Kansas 67221

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Mr. Robert A. Lakin, Director
Sedgwick County Planning Department
City Hall, 10th Floor
455 North Main
Wichita, Kansas 67202

Meeting On McConnell Airspace Planned

Derby Daily Reporter 5-21-81

McCONNELL AFB, Kan. - Colonel Charles D. Belt, 381st Combat Support Group commander at McConnell Air Force Base, has scheduled a public meeting to recommend to Wichita and Sedgwick County how land use planning and control can best serve land and business owners surrounding Mcconnell as well as the future requirements of the Air Force. The meeting is set for May 27 at 2 p.m. in the lower auditorium of the Fourth Financial Center.

The official title of the study to be presented is AICUZ - Air Installation Compatible Use Zone. The study outlines a comprehensive planning concept designed to work toward achieving compatibility between McConnell Air Force Base and the neighboring communities, by means of land use planning and control processes developed by the local governments.

The AICUZ study is an updated version of an earlier AICUZ presented in 1978. In May 1980, the Kansas Air National Guard, hosted at McConnell, converted its aircraft training mission from F-105's to F-4's. The KC-135 has also changed its departure procedures. These actions have prompted McConnell authorities to conduct a new study and amend the present AICUZ study.

The purpose of the study is to provide data and recommendation to local authorities to assist them in protecting the health, safety and welfare of local citizens, and to prevent, through compatible land use planning, an adverse impact to the operational capability of the base. It is up to the local governments to decide if or to what extent they will apply the AICUZ study.

The Air Force views its responsibilities in the AICUZ process as being two-fold. The first is to insure all possible steps have been taken to reduce the noise impact generated by aircraft operations. The second is to be an active and willing participant in the on-going cooperative planning process through which compatible development plans are generated by the local community.

In the fulfillment of the first responsibility, McConnell Air Force base has always participated in a noise abatement program by continually evaluating its procedures and making operational changes wherever possible to reduce the impact of base operations on adjacent land area.

The McConnell AICUZ study is a continuation of the Air Force program to prepare and release to the public AICUZ studies for Air Force flying bases. Acceptance by local communities indicates it is a rational basis for compatible use of planning ir airport environs.

WICHITA-SEDGWICK COUNTY

METROPOLITAN AREA PLANNING DEPARTMENT

DATE 7/7/81

TO Metropolitan Area Planning Commission

FROM Robert A. Lakin, Director of Planning

SUBJECT MCCONNELL AFB AICUZ REPORT

Attached for your review and information is a copy of the updated Air Installation Compatible Use Zone (AICUZ) Report recently released by McConnell AFB. The report updates the original AICUZ report, published in July 1978, based on new climb-out procedures for the KC-135's and the replacement of the F-105 training mission by the F-4's. The primary purpose of the report is to evaluate the effects of aircraft noise and accident potential on the Air Force Base environs, and to make recommendations concerning compatible land uses within the affected areas.

We have reviewed the report in detail to discern the changes from the earlier report which was discussed with you after its release in 1978. The primary changes are as follows:

1. The flight tracts have been revised (Fig. III-1) to reflect a new KC-135 climb-out procedure implemented in November, 1978, and the new F4 training mission which replaced the F-105's in May 1980. The KC-135's now climb to 2000 ft. before leveling off instead of 1000' as before. The F4's, while no louder than the F-105's they replaced, do make a greater number of flights (based on 1982 "worst case" conditions.)

2. The noise contours have been revised according to the new aircraft mix and flight tracts. The result is a longer and slightly wider noise "footprint" for each Ldn level (i.e., 65,70,75,80). The greatest change is in the coverage of the 65 Ldn contour which now extends approximately 2 1/2 to 3 miles farther out on the ends (north/south) and is also slightly wider. The other contours are enlarged to a lesser extent (see attached map).

3. The land use maps (Figures IV-3, and IV-5) have been updated and revised to indicate compatibility, based on their criteria (Figure IV-2), in addition to land use by type as shown in the previous report. The categories shown are "compatible", "conditionally compatible", and "incompatible".

The compatibility criteria and "Compatible Use Districts" discussed on pages IV-5 through IV-13 are identical to the original report. The application of this concept to specific areas varies from the original report only where the noise contours cover more land. All other sections of the report are virtually unchanged, except for updating some of the inventory figures.

The AICUZ Report also recommends certain land-use guidelines, based on the compatibility of various land uses with the different noise exposure levels and accident potential zones. In general the report recommends no residential uses in zones above Ldn 75, and usually no restrictions below Ldn 65. Between Ldn 65 and 75, residential uses are marginal and noise attenuation measures are recommended.

As with the previous report, this AICUZ report represents a major effort by McConnell AFB in cooperating to develop land use policies compatible with their continued operations and viability, as well as to continue to be a "good neighbor" within the community. I am scheduling the updated AICUZ report to be considered on your July 16 agenda for review and discussion purposes. Copies of the report are very limited so we would ask that you keep them available for further reference.

RECOMMENDED ACTION: It is recommended that the Wichita-Sedgwick County Metropolitan Area Planning Commission receive and file the 1981 Amended AICUZ Report.

Robert A. Lakin
Director of Planning

RAL:BAC:rh
Attachments
cc: Willard L. Stockwell, Chief Planner, Advance Plans Division
Jack Galbraith, Chief Planner, Current Plans Division
Colonel Charles D. Belt, Commander, Combat Support Group, McConnell AFB
Richard D. Upton, President, Chamber of Commerce, Wichita

WICHITA-SEDGWICK COUNTY

METROPOLITAN AREA PLANNING DEPARTMENT

DATE 7/7/81

~~MKS~~ Cunfam

RE: AGENDA ITEM NO. 11

TO Metropolitan Area Planning Commission

FROM Robert A. Lakin, Director of Planning

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Director of Planning

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Richard D. Upton, President, Chamber of Commerce, Wichita

7-6-78 ~~ACUIZ~~ AICUZ

~~Chapman~~
~~WES~~
Files
MDR

Col John F Hampton
Air Installation Comp Compatible Use Zone.

Obj
- Operation capabilities
- protect citizenry.
- community welfare.

92 bases.
~~operations~~

CZ = 3M X 3M + separation

5,500 jobs.
200 MM in economy

Recommendations.
Zoning
height
fair disclosure
S/D
Building Codes.
CIP review

Issue in coexistance

? on FHA

RAL

June 20, 1978

Board of City Commissioners

Robert A. Lakin, Director of Planning

Air Installation Compatible Use Zone (AICUZ)

The Department of Defense, in particularly the Air Force, has been working for last three or so years on a program to provide better protection for the air bases from intrusion of incompatible land uses. This is looked at from both a hazard standpoint and from a noise and environmental standpoint. Their program, the AICUZ, is tailored as to an analysis of each air base with its particular operational characteristics and aircraft type. The report on Wichita is one of the last ones to be released in the country.

Attached is a pamphlet describing the AICUZ. Essentially, it will recommend to local governing bodies that actions be taken to zoning ordinances, subdivision regulations and building codes, to provide better protection from incompatible land uses for McConnell Air Force Base.

The base commander will release this report on July 6 at 10:00 a.m. The presentation will be made in the City Commission Room, City Hall. It will take about one hour's time. I would strongly encourage you to be present for the presentation. Formal notices will be forthcoming from McConnell Air Force Base and they are asking that the release of this information generally be withheld until their public information office make the formal press release on this matter. If there are any questions, please give me a call.

Robert A. Lakin
Director of Planning

RAL:rme
Attachment

cc: E. H. Denton, City Manager
Bill Morris, Public Affairs Officer

Same memo also sent to: MAPC
Board of County Commissioners with cc's to Ted Hill, County Counselor and Keith Mackey, County Public Information Officer

Col John F Hampton
381st Strategic Missile Wing

THE AIR INSTALLATION COMPATIBLE USE ZONE

PROGRAM AT
MCCONNELL AFB

The Air Installation Compatible Use Zone program has been designed to achieve compatibility between installations and neighboring communities by means of a compatible land use planning and control process carried out through appropriate legislation at the state and local level. Here is how McConnell AFB is carrying out its program.

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As part of our overall Air Force environmental and community planning effort, the Air Force developed - and the Department of Defense established - AICUZ, which is an acronym for Air Installation Compatible Use Zone. AICUZ, is simply a concept of achieving compatible land use in non government areas adjacent to military airfields. For example, a low profile warehouse or storage structure near an airfield would pose no problems to military flight operations and, therefore, would constitute compatible land use. However, it doesn't take too much imagination to realize the problems that a high-rise structure would create in exactly the same location. Besides the height of structures, their use concerns us. To build a hospital or school in a high-noise and accident potential area, would not constitute compatible land use. In other words, AICUZ is a means by which we can maintain operational capability and prevent airfield encroachment, while accommodating compatible civil growth and development. It works through the public land use planning and control process.

Although this sounds relatively simple, AICUZ is a highly complex and demanding program, designed to provide a comprehensive rational basis for cooperative planning and action. The Air Force has been a leader in the subject of airfield environs land use planning since the 1950s when it first started evaluating the impact of noise around airfields, but much of the work, until recently, was of a laboratory nature. We, as well as other airport operators, know that we have a problem, and that problem is encroachment of our installations, caused by incompatible urban development. Historically, this encroachment has resulted in the reduction of mission capability, and has contributed to base closures or the elimination of flying.

We have found that no other agency has the direct responsibility of protecting Air Force bases, or for that matter, the people near our bases. Other Federal agencies, such as the Environmental Protection Agency, Federal Aviation Administration, the Department of Housing and Urban Development, and Veterans Administration, are involved to one degree or another, but only the Air Force has the prime responsibility. This is also true for civilian airfields in that the responsibility rests with the airfield operator. By approaching this matter on the basis of mutual concerns, which the AICUZ does, the Air Force has a tool and the flexibility to avoid problems resulting from incompatible development. Our AICUZ objectives are quite simple. The primary objective is to maintain Air Force operational capability. A second, and equally important reason, is to assist local authorities in the protection of their citizens. Since the Air Force mission is to protect the American people, it follows that we must exhibit this same concern for their protection in our daily operations. The protection and promotion of the public health, safety and welfare are addressed by AICUZ. In terms of health, we are talking about noise exposure. For safety considerations, the Air Force must be aware of aircraft accident potential to adjacent land areas as well as hazards to our operations from improper land uses. The third factor is that of the community welfare, both economic and social. Air Force bases are major industries and social centers, and as a result, are a key element of the community fabric. It is therefor necessary, in the interests of the community, to retain them.

The Air Force AICUZ program has been designed to achieve compatibility between installations and neighboring communities by means of a compatible land use planning and control process carried out through appropriate state and local legislation and intergovernmental coordination with Federal agencies. This is the first time in military - or to the best of our knowledge, civil-history that a process has been developed that approaches the successful accommodation of such interests. Today's AICUZ concept developed through an evolutionary process. It started in 1971 with the Air Force "Greenbelt" program which arbitrarily designed an area around airfields for which we identified special land use considerations. In 1971, the Air Force renamed the program AICUZ and began working cooperatively with local governments. By mid 1971, the Air Force found that a simplified, arbitrary approach would not work, and as a result, a methodology was developed in which noise zones and accident potential zones were designated and combined, by overlay, to create a single map of compatible use districts. Land use compatibility guidelines have been developed for each of the compatible use districts. This map, the land use compatibility guidelines, and a full analysis of the relationship between aircraft operations and adjacent land use, are published as an AICUZ study document.

AICUZ studies began at 92 Air Force bases, including McConnell AFB, Kansas, in October 1973. It was a massive effort involving 10 functional areas. Data was collected on operations, weather, economics, state and local laws, operational hazards, accidents, land ownership, community development, and the relationship between the base and the community.

Our development of the Air Force AICUZ program began with a complete layout of flight paths and altitudes of aircraft operating out of McConnell AFB, to get a visual display of the overall noise picture from an aerial point of view. These flight paths, combined with other operational and noise source data, created a composite set of noise zones surrounding the base.

A set of accident potential zones was created, outlining the most hazardous areas, by relating an Air Force study of the history of aircraft accidents worldwide to our facilities at McConnell AFB.

The noise zones and accident potential zones were combined to create a single map of compatible use districts. This map, used with related land use compatibility guidelines, provides basic data for planning compatible development around the McConnell AFB complex.

Nationwide, the Air Force AICUZ program is producing tangible results. Land use contral ordinances based on AICUZ have already been enacted or amended around many bases. Historically, the citizens of Sedgwick County and the personnel of McConnell AFB have worked together in cooperative and harmonious efforts to better serve the needs and desires of all concerned. We have collectively found solutions which have maximized the benefits of McConnell AFB while minimizing the annoyances. If the future of McConnell AFB is to be as bright as its past, you, the citizens of Sedgwick County, will once again need to participate in the solution of our mutual concerns. We request your careful and considered review of the recommendations contained in the McConnell AFB AICUZ study. In brief, these recommendations include:

* The AICUZ study should be adopted as an official premise for future planning.

* Zoning ordinances should be adopted, or modified, to reflect the compatible land uses outlined in the AICUZ study.

* Fair disclosure ordinances should be enacted to specify disclosure to the public of those AICUZ items directly related to the McConnell AFB complex operations.

* Height control of structures near flight paths should be regulated by incorporation into zoning ordinances.

* Comprehensive plans need to be developed, or updated, to include the land use recommendations of the AICUZ study.

* Subdivision regulations should provide for compatible land use review, imposition of conditions to minimize or prevent incompatibilities, open space dedication and berm or barrier construction.

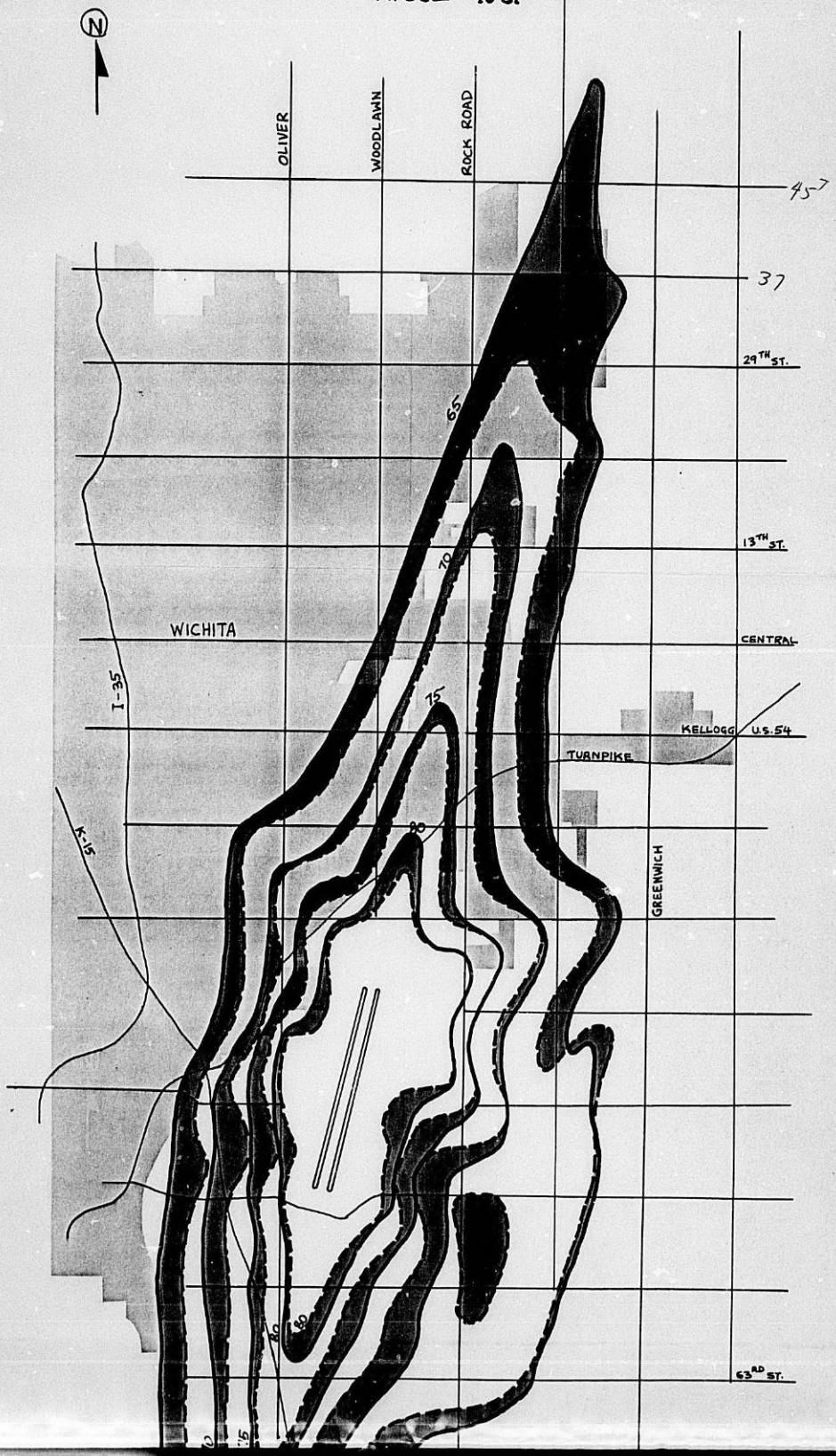
* Building codes should be amended to require structural noise attenuation for buildings to be located in the noise zones, thus expanding the range of compatible land uses.

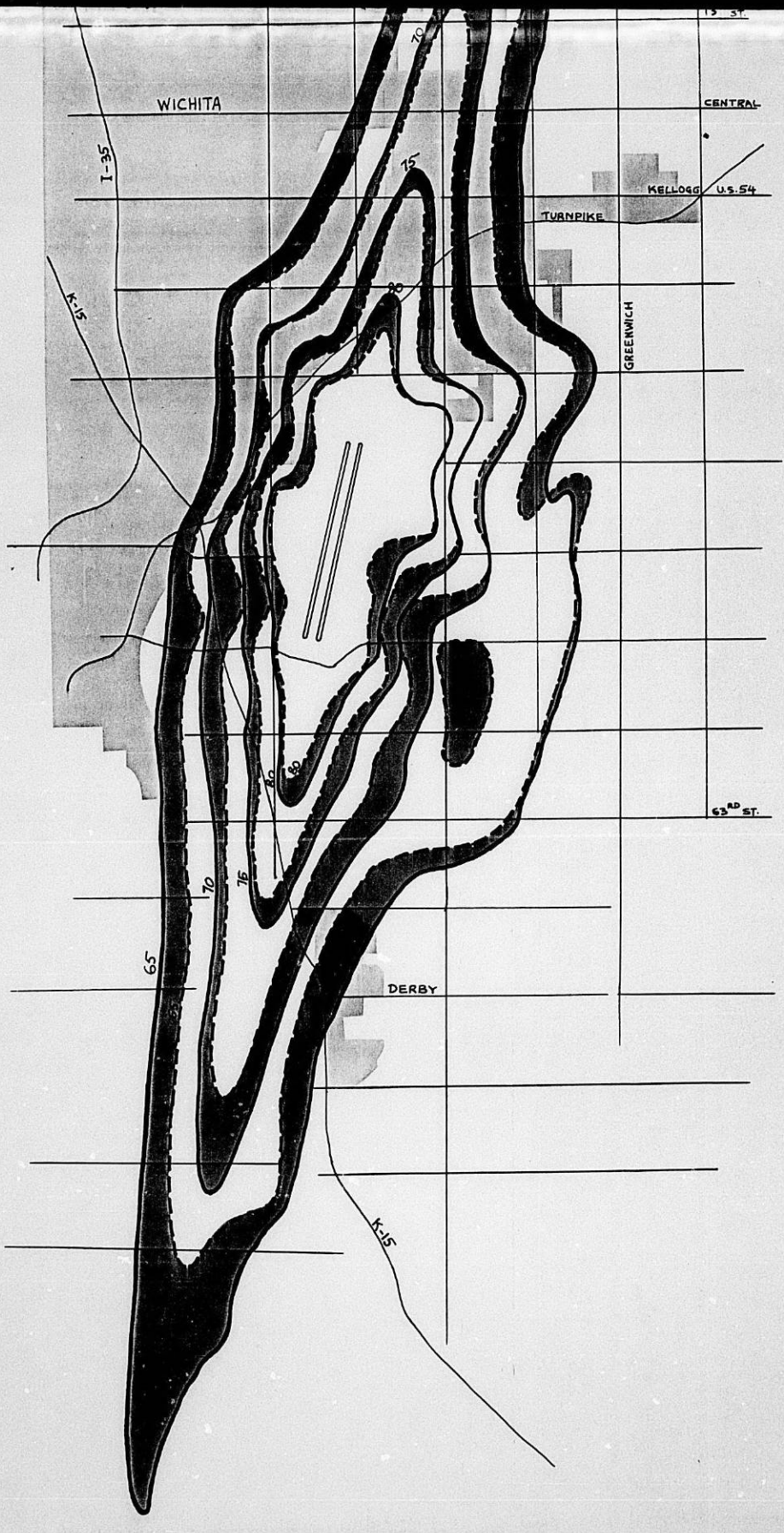
* Capital improvement programs should be carefully reviewed to discourage incompatible land use patterns, with particular emphasis on utility extension planning.

The basic issue is coexistence between air installations and adjacent communities. The AICUZ program is an example of how the Air Force is addressing this issue. This program is not intended to be a one-time effort. As situations and conditions change, AICUZ data will be revised.

Hopefully, this brochure has been successful in conveying to you the level of the Air Force commitment to environmental quality and community planning. We are convinced that aviation facilities can be good neighbors, but only if those of us involved in aviation make the effort to cooperate with local officials and citizens to resolve mutual concerns and problems. We, the taxpayers, cannot afford the luxury of building new bases to replace those forced to close by incompatible development. McConnell AFB is a vital asset to this community, and we want to stay. With your cooperation and support, we will.

ATTACHMENT 1
Revised Noise Contours
AICUZ - 1981

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WICHITA-SEDGWICK COUNTY

METROPOLITAN AREA PLANNING DEPARTMENT

DATE 7/7/81 Ephil

File in DR case

TO Metropolitan Area Planning Commission

FROM Robert A. Lakin, Director of Planning

DR 81-18

SUBJECT MCCONNELL AFB AICUZ REPORT

Attached for your review and information is a copy of the updated Air Installation Compatible Use Zone (AICUZ) Report recently released by McConnell AFB. The report updates the original AICUZ report, published in July 1978, based on new climb-out procedures for the KC-135's and the replacement of the F-105 training mission by the F-4's. The primary purpose of the report is to evaluate the effects of aircraft noise and accident potential on the Air Force Base environs, and to make recommendations concerning compatible land uses within the affected areas.

We have reviewed the report in detail to discern the changes from the earlier report which was discussed with you after its release in 1978. The primary changes are as follows:

1. The flight tracts have been revised (Fig. III-1) to reflect a new KC-135 climb-out procedure implemented in November, 1978, and the new F4 training mission which replaced the F-105's in May 1980. The KC-135's now climb to 2000 ft. before leveling off instead of 1000' as before. The F4's, while no louder than the F-105's they replaced, do make a greater number of flights (based on 1982 "worst case" conditions.)

2. The noise contours have been revised according to the new aircraft mix and flight tracts. The result is a longer and slightly wider noise "footprint" for each Ldn level (i.e., 65,70,75,80). The greatest change is in the coverage of the 65 Ldn contour which now extends approximately 2 1/2 to 3 miles farther out on the ends (north/south) and is also slightly wider. The other contours are enlarged to a lesser extent (see attached map).

3. The land use maps (Figures IV-3, and IV-5) have been updated and revised to indicate compatibility, based on their criteria (Figure IV-2), in addition to land use by type as shown in the previous report. The categories shown are "compatible", "conditionally compatible", and "incompatible".

The compatibility criteria and "Compatible Use Districts" discussed on pages IV-5 through IV-13 are identical to the original report. The application of this concept to specific areas varies from the original report only where the noise contours cover more land. All other sections of the report are virtually unchanged, except for updating some of the inventory figures.

The AICUZ Report also recommends certain land-use guidelines, based on the compatibility of various land uses with the different noise exposure levels and accident potential zones. In general the report recommends no residential uses in zones above Ldn 75, and usually no restrictions below Ldn 65. Between Ldn 65 and 75, residential uses are marginal and noise attenuation measures are recommended.

As with the previous report, this AICUZ report represents a major effort by McConnell AFB in cooperating to develop land use policies compatible with their continued operations and viability, as well as to continue to be a "good neighbor" within the community. I am scheduling the updated AICUZ report to be considered on your July 16 agenda for review and discussion purposes. Copies of the report are very limited so we would ask that you keep them available for further reference.

RECOMMENDED ACTION: It is recommended that the Wichita-Sedgwick County Metropolitan Area Planning Commission receive and file the 1981 Amended AICUZ Report.

Robert A. Lakin
Director of Planning

RAL:BAC:rh
Attachments
cc: Willard L. Stockwell, Chief Planner, Advance Plans Division
Jack Galbraith, Chief Planner, Current Plans Division
Colonel Charles D. Belt, Commander, Combat Support Group, McConnell AFB
Richard D. Upton, President, Chamber of Commerce, Wichita

WICHITA-SEDGWICK COUNTY

METROPOLITAN AREA PLANNING DEPARTMENT

DATE June 16, 1981

TO Willard L. Stockwell, Chief Planner, Advance Plans Division

FROM Robert A. Lakin, Director of Planning

SUBJECT AICUZ Reports

I have the AICUZ reports in my office. I have kept one for my file. We need to prepare a letter of transmittal to the Planning Commission, and also see that copies go to the County Commission and City Commission. Please note in the transmittal that these copies are limited and that they should keep them available for future reference. Have somebody read through the report. Be able to prepare a one to two page summary of the content of the report and the changes from the first report to this one. As soon as you have that prepared, lets plan on putting it on the Planning Commission agenda for formal consideration to receive and file, and take such other action as we may want to recommend, or that they may want to accomplish. The copies are pretty limited and make sure that Galbraith gets a copy for his shop, and also that you keep one in your place. If we need more copies, get ahold of them out at McConnell and see what you can get.

Robert A. Lakin
Director of Planning

RAL:rme

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 381ST COMBAT SUPPORT GROUP (SAC)
MCCONNELL AIR FORCE BASE, KANSAS 67221

3 JUN 1981

REPLY TO ATTN OF: DEEV (Mr Janssen, 681-5525)

SUBJECT: McConnell Air Force Base 1981 Amended AICUZ Release

TO: Metropolitan Area Planning Commission
Tenth Floor
City Hall Bldg
455 N. Main
Wichita KS 67202

1. Forwarded for your use and information are 20 copies of the McConnell Air Force Base 1981 Amended Release of our Air Installation Compatible Use Zone (AICUZ) Plan.

2. If there are any questions, please contact Mr Janssen, 681-5525.

RAMON R. JOHNSTON, PE
Deputy Civil Engineer

1 Atch
AICUZ Amended Release (20)

RECEIVED
JUN 9 1981
METROPOLITAN PLANNING
ROUTE ☐ _____
☒ _____

Peace....is our Profession

WICHITA-SEDGWICK COUNTY

METROPOLITAN AREA PLANNING DEPARTMENT

DATE June 1, 1981

TO Willard L. Stockwell, Chief Planner, Advance Plans Division

FROM Robert A. Lakin, Director of Planning

SUBJECT AICUZ Report

Attached is a copy of the AICUZ report. Have someone read it over for content. See what significant changes are involved, including analysis techniques, change in operating procedures and areas covered. Have a new slide prepared showing the AICUZ zones. It might also be appropriate to have least a work map showing the difference between the old contours and the new, and how far they have moved.

Also look at the report and see what happened to the recommendations as compared to the old report. The old AICUZ report recommended given compatible use districts by numbers, such as CUD-12, CUD-13, etc. I don't see those as applied to Figure 4-5. Report anything of significance to me orally at the earliest possible date. Also have somebody prepare a recommendation sheet for transmission to the Planning Commission. As soon as we get the copies of the report from the Air Force, I would like to schedule it for information purposes before the Planning Commission and each of the governing bodies.

Robert A. Lakin
Director of Planning

RAL:rme

NOTE: It might be well to have that whole series of maps of the AICUZ report shot for slide purposes, particularly including the flight tracks and the air hazard zones, Figure 3-1 and Figure 3-2 respectively. Create some type of formal file on this, a S-file or DR file, so that we can always find a copy.

Figures III - 1, 2, 3
IV - 1, 3, 4, 5

AIR INSTALLATION COMPATIBLE USE ZONE

McCONNELL AIR FORCE BASE

KANSAS

APRIL 1981

AMENDMENT 1981

AIR INSTALLATION COMPATIBLE USE ZONE (AICUZ)

A REPORT TO THE GOVERNMENTS AND CITIZENS OF THE MCCONNELL AFB ENVIRONS

PREPARED BY

MCCONNELL A. F. B.

APRIL 1981

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 381ST COMBAT SUPPORT GROUP (SAC)
MCCONNELL AIR FORCE BASE, KANSAS 67221

28 APR 1981

TO THE GOVERNMENTS AND CITIZENS OF THE MCCONNELL AFB ENVIRONS

In May 1980, the Kansas Air National Guard, hosted at McConnell AFB, converted its aircraft training mission from F-105s to F-4s. In November 1978, the KC-135 flight manual was amended to include new departure climbout procedures. These actions have prompted us to amend the Air Installation Compatible Use Zone (AICUZ) report for McConnell AFB.

This AICUZ report is an effort to examine and evaluate the effects of aircraft noise and accident potential. It is used to develop planning mechanisms which will help to insure the health, safety, and welfare of the citizens of the surrounding communities and the operational capabilities of McConnell AFB are protected. This program is being applied to all Air Force bases with active aircraft operations within the United States. It has been developed in cooperation with the Department of Defense and a number of other agencies.

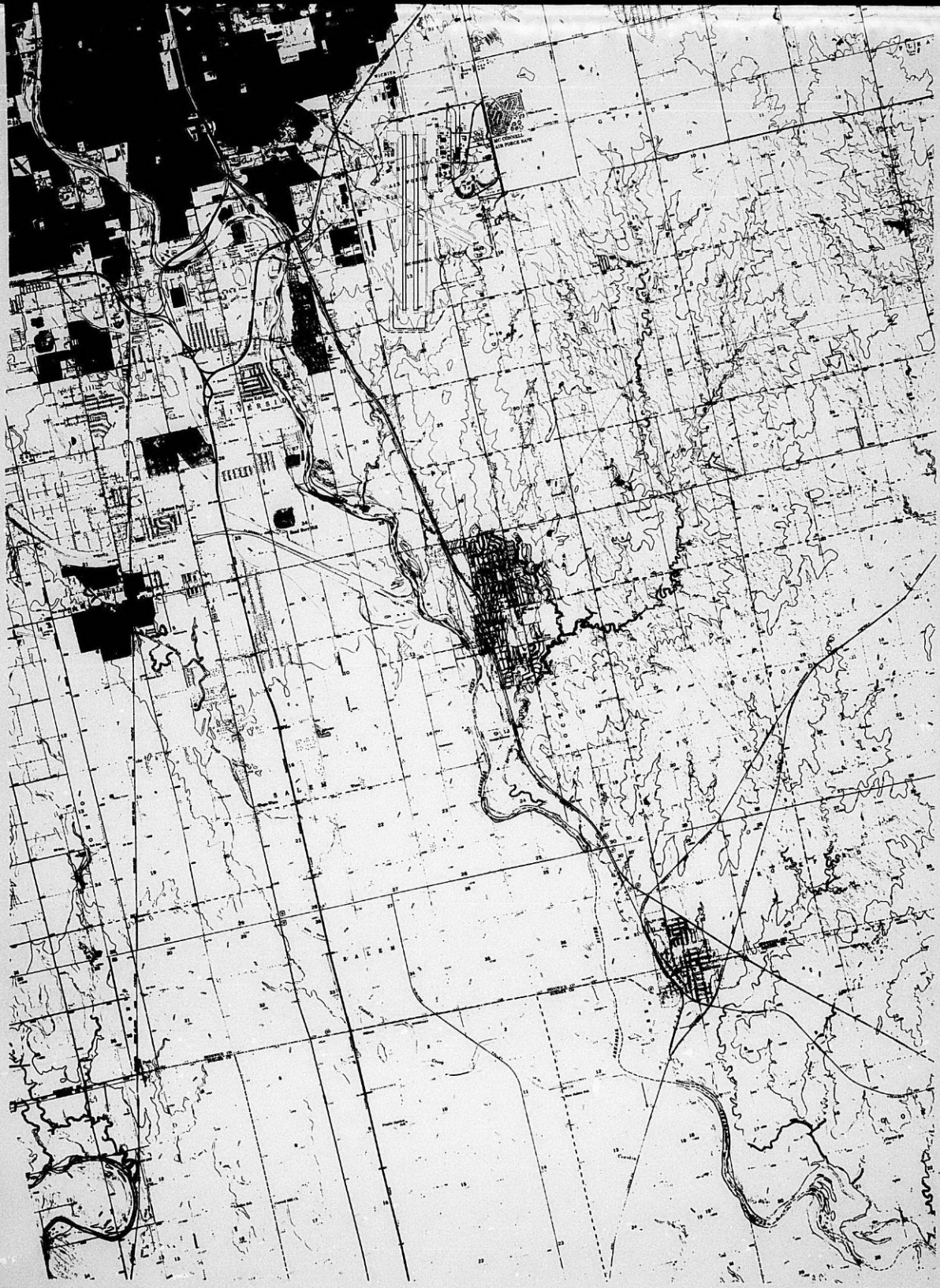
In the AICUZ report the Air Force presents its recommendations for changes in existing land use plans, policies and ordinances which will help to insure compatible relationships in the McConnell AFB environs. Through a cooperative effort between the Air Force and the surrounding communities much can be done to insure both national security and environmental quality needs are met.

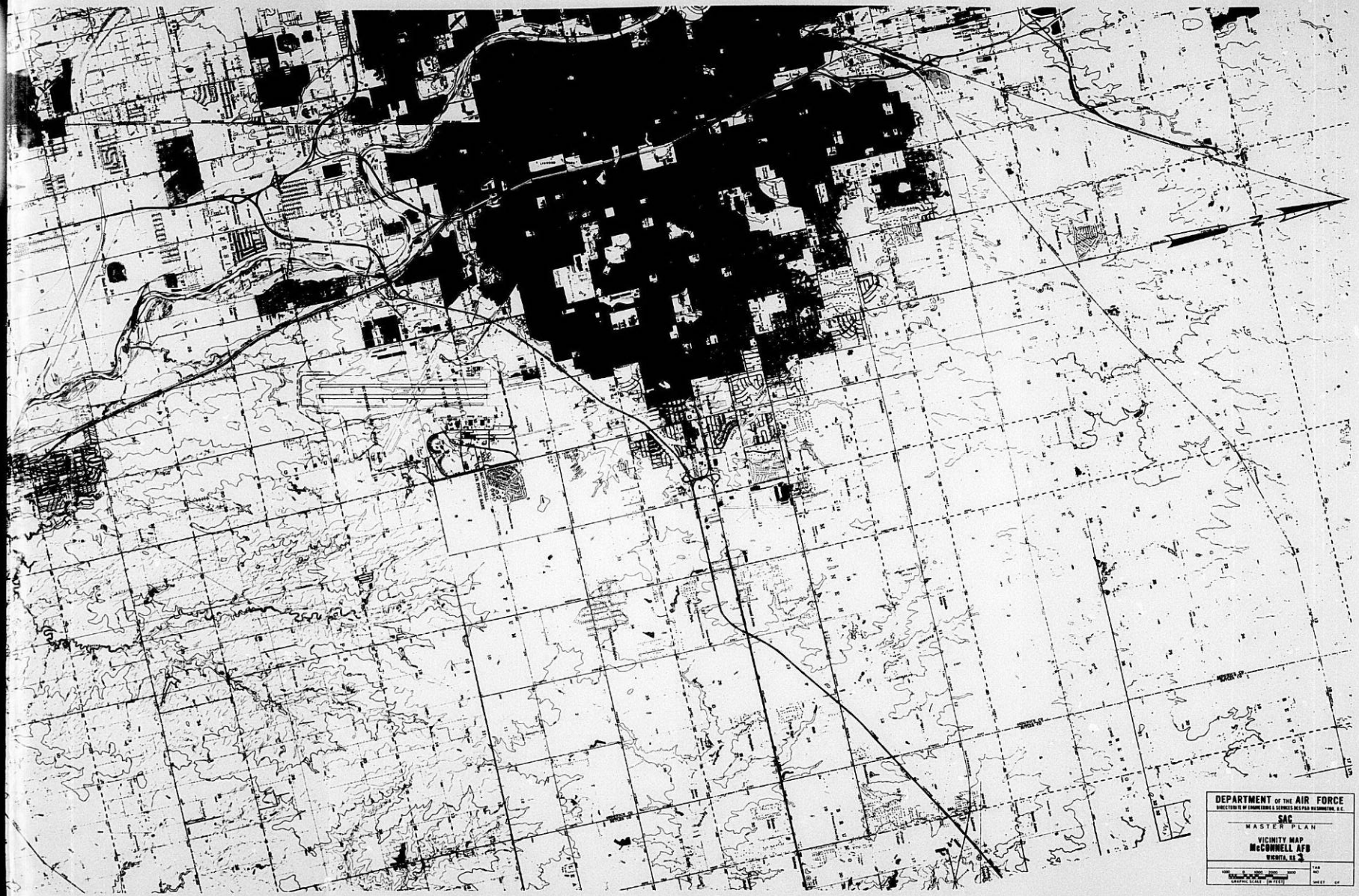
We hope that in the future, as in the past, all governing authorities will continue to consider all recommendations set forth in this AICUZ report in the development of land around the McConnell AFB environs.

Charles D. Belt

CHARLES D. BELT, Colonel, USAF
Combat Support Group Commander

Peace....is our Profession




DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF ENGINEERING & SERVICES DCS/P&O WASHINGTON, D.C.
SAC
MASTER PLAN
VICINITY MAP
McCONNELL AFB
WICHITA, KS
GRAPHIC SCALE IN FEET
SHEET OF

PREFACE

The U.S. Air Force has developed the Air Installation Compatible Use Zone (AICUZ) concept, which is designed to promote land use development near its airfields in a manner which will not only protect adjacent communities from the noise and safety hazards associated with aircraft operation, but also preserve the operational integrity of its airfields. Employing the latest technology for assessing levels of aircraft noise exposure and accident potential, the AICUZ concept specifies a wide variety of types and intensities of land usage, by a series of districts, which consider noise exposure and accident potential near airfields. The McConnell AICUZ report and amendment contains Air Force investigation results and suggestions concerning the latest aircraft operations and land use at McConnell Air Force Base. It is necessary to amend the initial AICUZ report to include the replacement of the F-105 Thunderchiefs with the later model F-4 and the new climbout procedures for the KC-135.

The Air Installation Compatible Use Zone for McConnell Air Force Base has been developed from the composite application of Accident Potential Zones (APZs), based on past Air Force-wide aircraft accident occurrence; Noise Zones (NZs), derived from the computer developed noise contour maps using the Day/Night Average Sound Level (DNL) methodology; and Federal Aviation Administration and U.S. Air Force flight obstruction height/clearance directives. The APZs and NZs, when combined, delineate several Compatible Use Districts which are the basic land use planning units within the AICUZ. Because of their significantly high accident potential, 3,000 feet by 3,000 feet rectangular areas immediately off the ends of each runway are designated as "Clear Zones". Due to the location of the runways at McConnell AFB, the combined width of the Clear Zone and the APZs is 3,800 feet.

This report has been tailored to the McConnell AFB situation and environs. However, it should be noted that the proposal's guiding principles can be applied to both civil and military installations with equal ease. It is hoped that this report will assist in the resolution of land use planning questions in the McConnell AFB environs for the benefit of all concerned.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

1. Land use controls for areas adjacent to airfields are necessary. Serious negative impacts can result where such controls are absent and incompatible development proceeds.

2. The public can only be protected from noise and other dangers inherent with air base operations by appropriate land use controls.

3. Though originally sited some distance from its supporting communities, McConnell AFB feels the effect of urban encroachment.

4. Recognizing the critical nature of urban encroachment on Air Force Bases throughout the United States. Air Force has developed an Air Installation Compatible Use Zone (AICUZ) concept which recommends land use districts and guidelines of compatibility for land areas impacted by aircraft operations. The AICUZ land use recommendations are based on the combined factors of accident hazards, noise and obstacle clearances.

5. The AICUZ program is the further refinement of a program which began in 1971, called the Greenbelt concept and which specified a rectangular planning area of 2½ miles from the runway ends and one mile on each side of the runway centerline.

6. The AICUZ consists of Accident Potential Zones (APZ) based on past aircraft accident patterns, Noise Zones (NZ) developed by the computerized Day/Night Average Sound Level (DNL) technology, and the use of FAA and USAF height directives. The APZs and NZs are overlaid to create Compatible Use Districts (CUD) which are the basic planning units of the AICUZ program.

7. Compatible land use control over off-base areas must be accomplished through land use planning and control processes initiated by local communities.

8. An inventory and analysis of McConnell AFB flying operations has been performed. It included such things as the type of aircraft using the base, where they fly, how high they fly, how many times they fly over a given area, and the time of day that they operate.

9. The U.S. Air Force conducted a study of past aircraft accidents and formulated a set of Accident Potential Zones (APZ) and an expanded Clear Zone. The McConnell APZs extend 15,000 feet from each runway threshold. The parallel runways have Clear Zones 3000 feet wide which overlap to produce a zone 3800 feet wide by 3000 feet long.

10. The methodology used to produce the noise contours contained in this study is called the Day/Night Average Sound Level (DNL) system which is the most sophisticated and technically accurate assessment system in use today for describing the amount of exposure to aircraft noise.

11. A Compatible Use District (CUD) is an area in the airfield environs which possesses distinct characteristics as to noise levels and accident potential and is the building block for compatible land use. For the purposes of the McConnell Air Force Base environs, 10 CUDs have been designated. Reference Figure IV-1.

12. Guidelines have been included in the study as to which land use is recommended in each of the CUDs. Reference Figure IV-2.

13. Presently, the comprehensive land use plans for McConnell AFB environs show that the general area should be retained for low density residential, agricultural, and industrial use. Some areas within the AICUZ however have been identified for higher density residential development, a use generally incompatible with AICUZ recommendations.

14. An analysis of existing and potential land use conflicts in the McConnell AFB environs indicates that dense residential and commercial uses pose the greatest problem.

15. Both the Air Force and the adjacent communities have responsibilities in addressing land use planning questions. The Air Force role is to minimize the impact of its operations in such a way as to reduce aircraft noise levels and accident hazards and to make land use recommendations to the adjacent communities. The role of the local community is to insure that development of the airfield environs is compatible with sound planning and development principles and practices.

16. McConnell AFB has evaluated its operations to minimize their impact on adjacent land areas without degrading the base's primary mission.

17. A square area off the end of each runway has now been designated as the airfield "expanded clear zone". The Air Force has received Congressional authorization and funding to acquire the necessary real property interests for control of that portion located off base proper.

CONCLUSIONS AND RECOMMENDATIONS

1. An analysis of existing and proposed land use within the McConnell AICUZ indicates that there are existing incompatible land uses north of the base and that other future incompatible land uses are likely primarily to the north and east of the base.

2. There is significant impact upon the City of Wichita from McConnell AFB operations.

3. With a greater emphasis on compatible land uses, and with noise attenuation requirements for new construction, future compatibility problems may be avoided.

4. The existing flight patterns for the assigned mission represent an optimum situation in terms of minimal land use impacts. Further modifications could result in safety hazards or mission degradation. Appendix G discusses these modifications more thoroughly.

5. Although the Day/Night Average Sound Level (DNL) maps differ from those prepared by the Composite Noise Rating (CNR) methodology, the DNL procedure more accurately defines the noise environment.

6. Further encroachment of McConnell AFB could be critical. Local communities should guide, control, and regulate future growth and development to insure the public health, safety, peace, comfort, convenience and general welfare within the airfield environs, and to prevent the impairment of the airfield.

7. In order to promote orderly and compatible use of land around McConnell AFB, this AICUZ study has been prepared. The Combatible Use Districts (CUDs) in this report are a recommended tool for local community planning and should be considered for incorporation into existing land use plans and ordinances of the local communities to serve as one basis for approval or disapproval of future development requests. The noise contours that establish the CUDs due to their dynamic nature, should not be used as rigid boundaries in zoning ordinances.

9. Local jurisdictions in the McConnell AFB environs should review their building codes and, where necessary, incorporate sound attenuation requirements for the areas within the AICUZ boundary.

10. Of the possible land use conflicts with aircraft operations, residential and commercial incompatibilities are the most predominat. Although it is possible to establish general guidelines, land use proposals should be fully evaluated, preferably on a case-by-case basis.

11. Residential uses are considered incompatible in Compatible Use Districts one through nine. Residential uses may be compatible in Compatible Use Districts 10 through 13 following a full evaluation and requiring that Noise Level Reduction Standards be incorporated into building design and criteria.

12. There is a wide range of compatible land uses within the AICUZ. Efforts should be made to plan for and promote such uses in lieu of permitting those uses which are incompatible.

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CHAPTER I - INTRODUCTION

I. INTRODUCTION

THE CHALLENGE

Airfields, military and civilian, attract activity in their environs. Sizable new cities may grow up near the airfield, or existing cities may grow outward toward the airfield environs. The inevitable encroachment process then makes inroads on the potential freedom of airfields to support flight operations. In some cases, sufficient adverse reactions against operations have arisen to contribute to the eventual elimination of flying. There appear to be two basic ways to handle this trend, either by converting the encroachment into a compatible development process or by construction of new airfields. Recognizing the likely limits to future construction budgets, and assuming that the military flying force structure may be reduced, it seems very unlikely that the Air Force will build many (if any) new military airfields within the United States. In reality, the Air Force will have to continue to use its existing military airfields and therefore must ask the community to prevent incompatible development caused by urbanization.

Land use controls for areas adjacent to airfields are necessary. Serious negative impacts can result where such controls are absent and incompatible development proceeds. For example, twenty-two people were killed when a civilian jet crashed into a Sacramento, California, ice cream parlor which was near the end of the runway. In another instance, a commercial 737 crashed into a residential neighborhood in the approach zone to Chicago's Midway Airport. Luckily, only a few persons on the ground were killed. There could have been many more. Such occurrences call for control of land which have the greatest potential for aircraft accidents.

Aside from the accident potential, aircraft generate a considerable amount of noise. Several Air Force installations have ceased flying operations or closed entirely due in part to adverse action by those who unwittingly purchased homes too close to these bases. Similary, Los Angeles International Airport, which has been thoroughly encroached upon over the years, has had many lawsuits pending in the courts.

Though originally sited some distance from its supporting communities, McConnell AFB is feeling the effects of land development. Experience has shown that when unguided development impinges upon a facility's accident potential areas and/or high noise zones, the impacted groups soon seek relief. This can range from the imposition of "quiet hours" to the complete closure of a facility. Conversely, it must be recognized that the public must be protected from the noise and danger inherent in air base operations. Therefore, it is in the best public interest to protect the taxpayer's multi-million dollar investment in McConnell AFB, and also give the citizens a plan for the rational development of lands impacted by aircraft operations that is fully attentive to their health, safety and welfare.

There are primarly three types of aircraft operating out of McConnell on a routine basis. These are the KC-135s assigned to the 384 Air Refueling Wing, the F-4Ds assigned to the Kansas Air Guard and transient aircraft mostly KC-135s and B-52s being modified by Boeing Air Force Plant, Wichita. There are numerous other transient aircraft including C-141s which use the McConnell runways. In common with all aircraft, these planes are noisy and not immune from accidents. However, as one of the larger bases in the midwest, McConnell Air Force Base is vital to our national defense.

Recognizing the critical nature of urban encroachment throughout the United States the Air Force has developed the AICUZ concept. The purpose of AICUZ is to recommend land use districts and guidelines of compatibility for land areas impacted by aircraft operations.

The AICUZ for McConnell AFB is based on a methodology developed by the Air Force which analyzes accident potential as well as noise exposure. Land use districts and guidelines have been developed. The guidelines are a composite of a number of other airport land use compatibility studies which have been refined to fit the McConnell AFB aviation environment.

The AICUZ land use guidelines are reasonable in that they ensure compatibility with airfield operations which allow maximum beneficial use of contiguous property. The Air Force has no desire to recommend land use regulations which render property economically useless. It does, however, have an obligation to the inhabitants in the McConnell AFB environs and the citizens of the United States to point out ways to protect both the people in adjacent areas and the public's investment in the installation itself.

AICUZ LAND USE DEVELOPMENT POLICIES

The basis of any effective land use control system is a set of land development policies which serve as the standard by which all airport environs land use planning and control actions are evaluated. The Air Force recommends that the following policies be considered for incorporation into the comprehensive plans for the McConnell AFB environs:

POLICY #1: In order to promote the public health, safety, peace, comfort, convenience, and general welfare of the inhabitants of airfield environs, it is necessary to:

1. Guide, control and regulate future growth and development.

2. Promote orderly and appropriate use of land.

3. Protect the character and stability of existing land uses.

4. Enhance the quality of living in the areas affected.

5. Prevent the impairment of the airfield and the public investment therein.

6. Protect the general economic welfare by restricting incompatible land use.

POLICY #2: In order to implement Policy #1, it is necessary to:

1. Incorporate the Air Installation Compatible Use Zone concept into existing land use plans, modifying them when necessary to:

a. Establish guidelines of land use compatibility.

b. Restrict or prohibit incompatible land use.

c. Prevent establishment of any land use which would unreasonably endanger aircraft operations and the continued use of the airfield.

2. Adopt appropriate ordinances to implenent airfield environs land use plans.

POLICY #3: Within the boundaries of the AICUZ, certain land uses are inherently incompatible. The following land uses are not in the public interest and must be restricted or prohibited:

1. Uses which release into the air any substance such as, but not limited to, steam, dust, and smoke, which would impair visibility or otherwise interfere with the operation of aircraft.

2. Uses which produce light emissions, either direct or indirect (reflective), which would interfere with pilot vision.

3. Uses which produce electrical emissions which would interfere with aircraft communication systems or navigational equipment.

4. Uses which attract birds or waterfowl, such as operation of sanitary landfills, maintenance of feeding stations, or growth of certain vegetation.

5. Uses which provide for structures within ten feet of aircraft approach-departure and/or transitional surfaces.

POLICY #4: Certain noise levels of varying duration and frequency create hazards to both physical and mental health. Also, a limited though definite danger to life exists in certain areas adjacent to airfields. Where these conditions exist, it is not consistent with the public health, safety and welfare to allow the following land uses:

1. Residential.

2. Retail business.

3. Office Buildings.

4. Public buildings (schools, churches, etc.).

5. Recreation buildings and structures.

POLICY #5: Land areas below take off and final approach flight paths are exposed to significant danger of aircraft accidents. It is, therefore necessary to limit the density of development and intensity of use in such areas.

POLICY #6: Different land uses have different sensitivities to noise. Standards of land use should be adopted, based on these noise sensitivities. In addition, a system of Noise Level Reduction guidelines for new construction should be implemented to permit certain uses where they would other wise be prohibited.

POLICY #7: Land use planning and zoning in the airfield environs cannot be based solely on aircraft-generated effects. Allocation of land used withing the AICUZ should be further refined by analysis of:

1. Physiographic factors.
2. Climate and hydrology.
3. Vegetation.
4. Surface geology.
5. Soil characteristics.
6. Intrinsic land use suitabilities and constraints.
7. Existing land use.
8. Land ownership patterns and values.
9. Economic and social demands.
10. Cost and availability of public utilities, transportation and community facilities.
11. Other noise sources.
12. Flood Plains.

STUDY OBJECTIVES AND CONTENT

This McConnell AFB - AICUZ study is presented as a statement of the Air Force's perspective on aircraft noise and accident potential in the environs of McConnell AFB. It is intended to serve as an input to the local comprehensive land use planning process of the jurisdictions which surround the base.

The objective of this study is to examine the effects of aircraft noise and accident potential from flight operations on adjacent communities. This examination establishes a background for relating land use to noise levels and hazard potential and to identify those uses which are compatible with flight operations.

It is also hoped that this study will provide the basis for continued cooperation between McConnell AFB and the local community in planning for the future.

The body of this report consists of the following:

1. A description of McConnell AFB, including its current units and missions, and the economic role played by the base.

2. A description of the AICUZ concept, including its historical development, principles, methodology, land use guidelines, and application.

3. A delineation of the McConnell AFB AICUZ area and discussion of land use compatibility guidelines as applied to current and projected land use near the base.

4. A discussion of Air Force responsibilities and McConnell AFB actions.

5. Recommendations for local action by surrounding jurisdictions.

Chapter II - McConnell Air Force Base and the Community

II. MCCONNELL AIR FORCE BASE AND THE COMMUNITY

THE BASE

McConnell Air Force Base is a permanent installation which should be protected against encroachment. It is located in the south central portion of the State of Kansas adjacent to the City of Wichita.

Wichita, Kansas, and the United States Air Force have a relationship almost as old as the Air Force itself.

Although this area has been a major producer of military and commercial aircraft since before World War II, the Air Force did not become an integral part of the community until June 5, 1951. Air Training Command established Wichita Air Force Base here and we shared flightline facilities with Wichita Municipal Airport, whose terminal building, built in 1928, was the Consolidated Base Personnel Office, until the summer of 1979 and is now part of Base Operations for the Kansas Air National Guard.

In 1954, Wichita Municipal Airport moved to the west side of town, and the Air Force renamed the entire 2460 acre site in honor of two Wichita brothers, Lt. Thomas L. and Capt. Fred McConnell who gained fame during World War II aerial combat.

In those early days, the base trained crews for the B-47, SAC's first all-jet medium bomber, which the Boeing Co. was producing in its factories on the west side of the base adjacent to the flightline.

Strategic Air Command assumed responsibility for the base on July 1, 1958, and continued B-47 training.

In 1960, construction began on 18 Titan II ICBM complexes around Wichita. The 381st Strategic Missile Wing became fully operational in December 1963.

Only two months earlier, Tactical Air Command (TAC) assumed command of McConnell AFB from SAC. The 388th Tactical Fighter Wing with F-100 Supersabres gave way to the 23rd Tactical Fighter Wing "Flying Tigers" and the 355th Tactical Fighter Wing which both flew the F-105 Thunderchiefs. In mid 1979, the F-105s of the 23rd and 355th (TFW) were changed to the F-4Ds of the 184th (TFG) Tactical Fighter Group.

For nine years, TAC units here supported operations in Southeast Asia by training aircrews and maintenance personnel for the F-105 units there. On July 1, 1972, the base once again transferred to SAC, when the 381st Strategic Missile Wing took over from the 23rd Tactical Fighter Wing.

Exactly one year earlier, 20 SAC KC-135 tankers activated here under the 91st Air Refueling Squadron. Today, the 91st and 384th Air Refueling Wing which activated on December 1, 1972 possess a total of 20 aircraft. With the addition of the 819th Civil Engineering Squadron (RED HORSE) in 1973, McConnell AFB is among the most versatile and complete of SAC installations.

Today McConnell is literally a small community within itself, although many of it's people live off-base. The McConnell "family" of dependents and military numbers about 11,000 persons. Together, the military and civilians employed at McConnell receive an annual payroll of more than $56,883,999, most of which is spent in the local area. Also, more than $21,567,000 is spent on local purchases and services annually. The base is part of the Strategic Air Command's 8th Air Force. A description of unit missions can be found in Appendix A. An economic study that provides data and information on the economic impact McConnell has on the local community is included in Appendix B.

THE COMMUNITY

Wichita is a city of many names. Each name tells a different aspect of the city.

Center City USA locates Wichita close to the geographic center of the continental United States. Surrounding Wichita are the historic prairies where pioneers trekked in their covered wagons and cowboys drove their herds of cattle to market. North, South, East, and West are all equally close.

This geographic location gives Wichita an interesting climate. It is far enough south to benefit from warm fronts during the winter, and far enough north to receive cooling fronts during the summer. Variety is the word that describes the local weather. January is the coldest month with an average minimum temperature of 23 degrees. July is the warmest month with an average maximum of 91 degrees. The average annual rainfall is 31 inches; the average snowfall is 16 inches. The prevailing winds are southerly with an average velocity of 13 miles per hour.

Air Capital of the World is another name. More than one-half of the commercial aircraft manufactured in the United States are from Wichita Aircraft manufacturing plants include Boeing, Beech, Cessna, and Gates-Lear Jet. McConnell AFB is an important addition to the aerospace industry.

Cow Town and Wheat Center tell of two of the other industries important to Wichita. Although the days of the long cattle drives are over, cattle remains an important product. Wichita has a regional market and meat-packing plant. The wheat lands surrounding the city are among the richest in the world. The Wichita area produces about seven million bushels of wheat each year.

The fourth significant industry is petroleum. Kansas and Wichita are the home of many small independent oil companies.

Wichita has the commission-manager form of municipal government. The commission chooses one of its five members to serve as mayor for one year and hires a city manager to act as the chief of administration and business head of the city government. The commission is responsible for making the laws and forming the policies under which the city operates.

The Wichita Standard Metropolitian Statisitcal Area (Butler and Sedgwick County) has a civilian labor force of 224,500 with an average of 2.5% unemployed as of September 1979.

The population of Wichita and Sedgwick County is dependent (at least in part) on the health of the aircraft industry, as is obvious by examining both the sudden increase in population in the early fifties and the larger decrease in 1971.

In 1970, the population of Sedgwick County had just experienced a five year growth spurt (1964-1969) but immediately following that period, is a time of national and local recession. County population decreased due mainly to loss of employment followed by outmigration. The population has again begun to climb, however, from 331,128 in 1971 to a peak of 342,403 in 1976. As of the end of 1977 the population had declined to 341,660.

HISTORIC POPULATION OF WICHITA

YEAR	POPULATION
1950	192,520
1951	201,246
1952	211,796
1953	192,182
1954	217,197
1955	224,700
1956	240,106
1957	244,671
1958	250,099
1959	242,131
1960	244,500
1961	243,443
1962	247,557
1963	263,595
1964	265,366
1965	267,949
1966	269,996
1967	281,110
1968	282,381
1969	282,989
1970	276,554
1971	263,297
1972	263,801
1973	262,766
1974	261,846
1975	264,669
1976	265,455
1977	263,449
1978	261,862
1979	261,001
1980	279,352

POPULATION OF SEDGWICK COUNTY

YEAR	POPULATION
1950	240,950
1951	256,860
1952	272,864
1953	260,150
1954	280,199
1955	297,388
1956	306,399
1957	312,131
1958	326,961
1959	321,503
1960	325,399
1961	324,020
1962	323,574
1963	322,113
1964	321,269
1965	328,463
1966	333,132
1967	346,461
1968	352,553
1969	354,223
1970	350,694
1971	331,128
1972	333,771
1973	335,564
1974	335,636
1975	339,223
1976	342,403
1977	341,660
1978	341,881
1979	342,254
1980	365,431

SCHOOLS

There are 118 schools in the three communities immediate to McConnell Air Force Base.

Wichita Public School System:

SCHOOLS	ENROLLMENT	CAPACITY
74 Elementary	24,656	35,900
17 Junior High	9,794	17,050
7 Senior High	9,703	11,550
TOTAL	44,153	64,500

Derby Public School System:

SCHOOLS	ENROLLMENT	CAPACITY
6 Elementary	2,580	2,900
2 Junior High	1,075	1,450
1 Senior High	1,188	1,280
TOTAL	4,843	5,630

Haysville Public Schools:

SCHOOLS	ENROLLMENT	CAPACITY
3 Elementary	1,674	1,950
1 Junior High	515	600
1 Senior High	892	1,200
TOTAL	3,081	3,750

RELATIONSHIPS

Air Force personnel and their dependents find opportunities to join and participate in all local recreational programs. In addition to a complete program of sports, the city supports a number of music and art organizations, two large libraries and two large museums.

Each year a series of special events is arrange by the Chamber of Commerce and other civic organizations, with the cooperation of base officials: Good will air tours, lectures and orientations on Wichita to and for base groups, Armed Forces Day program, and recognition dinners and programs for visiting and base officials.

A history of open and extensive interaction between McConnell AFB and the other communities in the metropolitan area has created a friendly atmosphere of cooperation and mutual concern between the base and its surrounding communities.

Civic contributions by McConnell people are evident through their leadership and participation in a large number of civic activities, such as Scouts, churches and neighborhood improvement organizations. In 1977 people on the base contributed $84,025 to the Combined Federal Campaign.

The McConnell Air Force Base Military Affairs Committee which is sponsored by the Wichita Area Chamber of Commerce, actively works with the base to continually improve an already outstanding relationship. The committee meets monthly to discuss mutual projects.

The McConnell Lions Club was established December 1975 with a membership of approximately 60. The Lions Club is a service club that is involved with the community. The club sponsored a Little League baseball team.

ECONOMIC RELATIONSHIPS

As was described previously McConnell AFB has also been growing rapidly over the past decade, and as it has grown, its role in the regional economy has grown as well.

The primary indicators of McConnell AFB's impact in the local economy are the amount of employment its activities generate, the amount of payroll generated, retail sales and taxes which can be attributed to base personnel.

With its current strength of 3989 military and 878 civilian employees, the base is one of the major employers in the region. The civilian jobs on the base represent an impact on the region's total of jobs.

At the same time the total yearly payroll (both military and civilian) of more than 37 million represents an impact on the total payroll for the area.

The McConnell AFB payroll, operation and maintenance and contracts amounting to approximately 71 million had a total economic impact of $177 million (using a 2.5 multiplier) on the local area for the fiscal year 1979.

The accuracy of the multiplier is admittedly difficult to determine; however, it is pointed out that the 2.5 multiplier is based on the assumption that three-fifths of income is spent and two-fifths is saved. Because impact is related to the portion spent, the 2.5 multiplier is believed to be conservative and is used here solely to point out that the impact of any activity goes far beyond any direct cash outlay. Simply stated, the multiplier shows the relationship between the original government expenditure and the total economic impact on the local economy.

CHAPTER III - THE AICUZ CONCEPT, PROGRAM AND METHODOLOGY

III. THE AICUZ CONCEPT, PROGRAM AND METHODOLOGY

BACKGROUND

Federal legislation, national sentiment, and other external forces which directly affect the Air Force mission, have served to greatly increase the Air Force role in environmental planning issues. Problems of airfield encroachment, noise, air and water pollution, and socioeconomic impacts require continued and intensified Air Force involvement. The nature of these problems dictates direct Air Force participation in the process of comprehensive communities and land use planning. Effective coordinated planning which bridges the gap between the Federal government and the local citizen, requires the establishment of good working relationships with local communities and planning officials which, in turn, depends upon creating an atmosphere of mutual trust and helpfulness. The Air Installation Compatible Use Zone (AICUZ) concept has been developed in an effort to protect local citizens from the noise and accident hazards associated with flying activities in the interest of their health, safety, and general welfare and also to prevent degradation of mission capability due to encroachment.

A land use compatibility program was actually initiated in 1971 as the Greenbelt Program. In 1972 the Air Installation Compatible Use Zone was established as a further development to the Greenbelt concept. Since that time, experience in AICUZ application, coupled with increasing national interest in protecting and enhancing our environment, has resulted in refinements of the initial concept. Although a rectangular planning area of two and one-half miles from the runway ends and one mile on each side provided a beginning for Air Force planning under the Greenbelt concept, it has not proven adequate as a basis for developing compatible use plans. Recent applications of the AICUZ approach and its acceptance by the local community indicates that it is a rational basis for airport environs compatible land use planning.

AIR FORCE POLICY

It is Air Force policy to work toward achievement of compatibility between air installations and the neighboring civil communities by means of a compatible land use planning and control process by the local community. The system for identifying and assessing land use compatibility is derived from the AICUZ concept. This concept embodies a process of projected, mapping and defining aircraft noise and accident potential areas in the air base environs. Land use compatibility guidelines are then applied to these areas. These serve as the basis for Air Force recommendations on land use planning and control by the community.

Air Force commanders at the major command and base level establish and maintain active programs to achieve the maximum feasible land use compatibility between air installations and neighboring communities. The program requires that all appropriate governmental bodies and citizens are kept informed of Air Force views whenever AICUZ or other planning matters affecting the installation are under consideration. This includes positive and continuous programs designed to:

1. Provide information, criteria and guidelines to state, regional and local planning bodies, civic associations and similar groups.

2. Inform such groups of the requirements of the flying activity, noise exposure, aircraft accident potential and AICUZ plans.

3. Describe the noise reduction measures which are being used.

4. Insure that all reasonable, economical and practical measures are taken to reduce or control Air Force noise producing activities. These measures include such considerations as proper location of engine test facilities; providing soundsuppressor where necessary; and adjustment of flight patterns and/or techniques to minimize the noise impact on populated area. This must be done without jeopardizing safety or operation effectiveness.

The AICUZ consists of land areas upon which certain land uses may obstruct the airspace or otherwise be hazardous to aircraft operations and land areas which are exposed to the health, safety or welfare hazards of aircraft operations. In other words the AICUZ includes:

1. Accident Potential Zones (APZ) based on past Air Force aircraft accidents.

2. Noise Zones (NZ) produced by the computerized Day/Night Average Sound Level (DNL) methodology.

3. The area designed by the Federal Aviation Administration and the Air Force for purpose of height limitations in the approach and departure zones of the base.

The AICUZ program designates Accident Potential Zones (APZ) and Noise Zones (NZ) and provides land use compatibility guidelines for these zones. The APZs and NZs are overlayed on base drawings to create Compatible Use Districts (CUD) which are the basic planning units of the AICUZ program. By combining the APZ and NZ land use guidelines the CUD becomes a composite input into the local planning process.

As part of the USAF Air Installation Compatible Use Zone program, the only real property interest for which the United States Air Force has requested and received Congressional authorization and appropriation to acquire is the area designated as the Clear Zone. Real property interest may be acquired by fee or as an easement giving the Air Force control over the use of the property. Fee land so acquired may be made available for the remaining airfield environs will be accomplished through the community land use planning and control process, provided the community is willing to enact it. At this time McConnell is finalizing the acquisition of Clear Zone area at the south end of the base.

FLYING OPERATIONS

In order to describe the relationship of aircraft operations with land use it is necessary to fully evaluate the exact nature of flying activities. An inventory and analysis of McConnell AFB flying operations have been performed and include such things as what kinds of aircraft use the base, where the aircraft fly, how high they fly, how many times they fly over a given area, and what time of day they operate.

Presently, McConnell AFB has a vital mission consisting of maintaining an Alert Force of KC-135 Aircraft and accomplishing the training required to maintain combat readiness of that force. It also hosts the Kansas Air Guard F-4D Training Squadron, which accomplishes training for all F-4D organizations in the Air Guard, Air Reserve and U.S. Air Force.

McConnell aircraft use the following six basic flight patterns: (See Fig III-1)

1. Straight out departure
2. Standard Instrument Departures
3. Straight in arrival
4. Successive Instrument Flight Rules (IFR) or Radar pattern.
5. Overhead landing.
6. Visual Flight Rules (VFR) rectangular pattern.

The flight paths of aircraft for McConnell AFB are the composite result of several factors, namely:

1. Other airports and air traffic routes in the vicinity of the base.

2. Air Force criteria governing the speed, rate of climb, and turning radius for each aircraft.

Operations are coordinated with FAA and flight paths are integrated to minimize conflict with civilian aircraft operations at Wichita Municipal Airport, and the Cessna and Beech Airports. Efforts are continually expended to control and schedule missions to keep noise levels to an absolute minimum, especially during nocturnal periods. Flight corridors have been selected with community disturbance and public reaction taken as a primary consideration. Pilot exposure to public needs is frequently provided through flying safety, training and standardization meetings. Flight patterns are shown in Fig III-1.

AIRPORTS ENVIRONS LAND USE PLANNING DETERMINANTS

Airports environs planning is concerned with three primary aircraft operational/land use determinants, (1) accident potential to land users, (2) aircraft noise and (3) hazards to operations from land uses (height, obstructions, etc.) Each of these considerations is addressed in detail using "state of the art" description and evaluation systems.

18LO
36C
36L9
18T7
18T8
18C
18D
18P1
18P2
18P3
18P4
18P5
36L1
18T1
36L3
36CR
36T5


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SAC
MASTER PLAN
FLIGHT TRACKS
McCONNELL AFB
WICHITA, KS
GRAPHIC SCALE IN FEET

FIG. III-1

ACCIDENT POTENTIAL ZONES

Of the three planning determinants cited above, accident potential is perhaps the most critical, but also, in the past, has been the least defined. Noise has been described by many sophisticated systems, and hazards of ground uses are covered by FAA and Air Force criteria.

Accident potential as being discussed here is in terms of where most accidents have occurred in the past at many Air Force bases. The results of this approach do not produce accident probability statistics. The question of probability involves too many variables for an accurate prediction model to be developed. Therefore, the analysis of the Air Force accident history focused on determining where, within the airfield environs, an accident was likely to take place and how large an impact area was likely to result from any single accident.

Prior concern for accident potential focused on approach-departure zones. Action on the belief that this did not completely describe the accident problem, a technique that more accurately depicts and analyzes the actual critical accident hazard areas has been developed for Air Force use and is included as Appendix C (See Figure III-2 for McConnell AFB Accident Potential Zones).

At both ends of the McConnell AFB runways expanded Clear Zones and two Accident Potential Zones have been designated (Figure III-2). Within the Clear Zone area the overall risk is so high that the necessary land use restrictions would prohibit reasonable economic use of land. As stated previously, the Air Force has requested and received Congressional authorization and appropriation to acquire the necessary real property interests in this area to prevent incompatible land uses. At this time McConnell Air Force Base is completing final acquisition of Clear Zone at the south end of the base.

Accident Potential Zone II is less critical than APZ I, but still possesses some risk. APZ II, is 7000 feet long, extending to 15,000 feet from the runway threshold. As stated earlier the Clear Zones and APZs for the parallel runways overlap for a total width of 3800 feet.

NOISE ZONES

In a study of airport and aircraft noise, two different types of noise measures are needed--one to measure the noise of individual noise events such as the noise of an individual aircraft flyover, and another to describe the noise environment resulting from a complex of noise events, such as the total noise effect of aircraft operations at an air base.

The methodology used to produce the noise contours contained in this study consists of the Day-Night Average Sound Level (DNL) system to depict the noise environment. This method of assessing the noise impact of aircraft operations on the area surrounding airfields is replacing the Noise Exposure Forecast (NEF) which was used on an interim basis by the Air Force to replace the Composite Noise Rating (CNR) system which was published by the Air Force in 1964. Continuing efforts to improve the CNR procedure over the last ten years resulted in the development of NEF. Efforts to provide a national uniform standard for noise assessment have recently resulted in the announcement by the Environmental Protection Agency that DNL will be recommended as the national standard. In the same way as CNR, NEF and DNL are methods of assessing the amount of exposure to aircraft noise and predicting the community response to the various levels of exposure. The DNL values used for planning purposes and for which contours are shown in Figure III-3 are 65, 70, 75, and 80. Land use guidelines are based on the compatibility of various land uses with these noise exposure levels. For broad planning purposes NEF 30, DNL 65, and CNR 100 may be considered equivalent, as may NEF 40, DNL 75, and CNR 115. However, due to technical differences in the three system direct comparison or conversion from one system to another can be misleading and is not recommended. Details concerning the DNL methodology are presented in Appendix D.

HEIGHT, OBSTRUCTIONS AND OTHER CONSIDERATIONS

Although height and obstruction criteria in the vicinity of airfields have been established for most airfields, including McConnell AFB, it is appropriate to mention these criteria in this report. Where such criteria are not included in the local community land use planning, there is a possibility that uses could be permitted which would endanger safe aircraft operations. Appendix E contains the basic Air Force height and obstruction criteria.

The land area outlined by Appendix E for purposes of height obstruction criteria should be regulated to prevent uses which might otherwise be hazardous to aircraft operations. The following uses should be restricted and/or prohibited:

1. Uses which release into the air any substances which would impair visibility or otherwise interfere with the operation of aircraft, e.g., steam, dust and smoke.

2. Uses which produce light emissions, either direct or indirect (reflective), which would interfere with pilot vision.

3. Uses which produce emissions which would interfere with aircraft communications systems or navigation equipment.

4. Uses which would attract birds or waterfowl, such as but not limited to operations of sanitary landfills, maintenance of feeding stations, or the growing of certain vegetation.

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SALEM

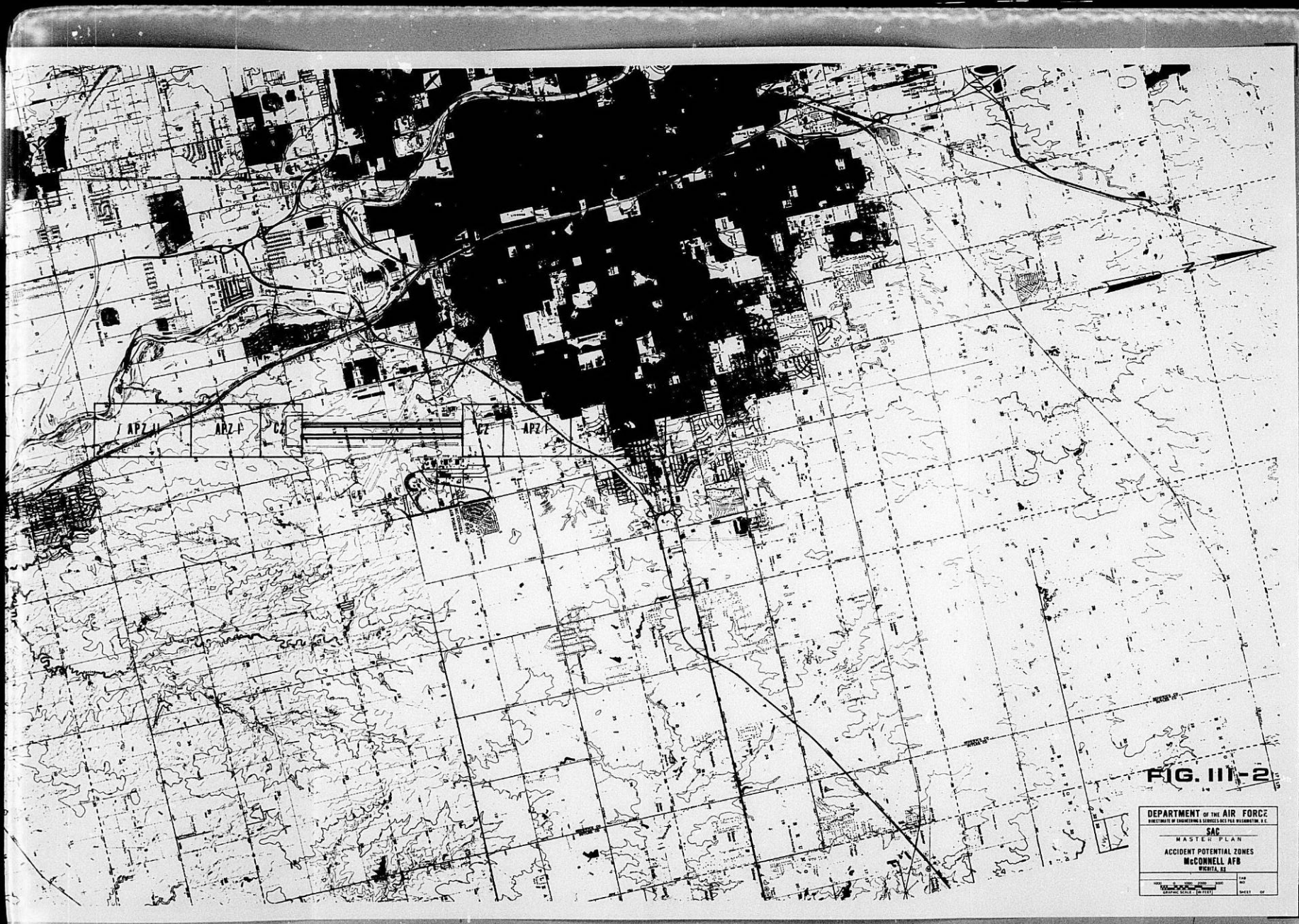

FIG. III-2

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF ENGINEERING & SERVICES HQ USAF WASHINGTON, D.C.

SAC
MASTER PLAN

ACCIDENT POTENTIAL ZONES
McCONNELL AFB
WICHITA, KS

GRAPHIC SCALE IN FEET

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BASIC LAND USE COMPATIBILITY

Although research with reference to aircraft accident potential, noise and land use compatibility is still in progress by a number of agencies and groups, it is possible to establish guidelines which can be incorporated into the land use planning process (Figure IV-2). These compatibility guidelines must not be considered as definitive or inflexible standards. They are the framework within which land use compatibility questions can be addressed and resolved. In each case full consideration must be given to local conditions such as (a) previous community experience with aircraft accidents and noise, (b) local building construction and development practices, (c) existing noise environment due to other urban or transportation noise sources, (d) time period of aircraft operations and land use activities, (3) specific site analysis, (f) noise buffers, including topography and (g) other similar factors. These basic guidelines cannot resolve all land use compatibility questions, but they do offer a reasonable framework from which to work.

ACCIDENT POTENTIAL

Land use guidelines for the two APZs are based on a hazard index system which compares the relationship of accident occurence for five areas:

1. On or adjacent to the runway.

2. Within the clear zone.

3. In APZ I.

4. In APZ II

5. In all other areas within ten nautical mile radius of the runway.

Accident potential "on or adjacent to the runway" or within the Clear Zone is so high that few uses are acceptable, while the risk outside APZ I and APZ II, but within the ten nautical mile radius area is not significant enough to warrant special attention.

Land use guidelines for APZs I and II have been developed. The main objective has been to restrict all people-intensive uses because there is greater risk in these areas. The basic criterion for APZ I and APZ II land use guidelines is the prevention of uses which:

1. Have high residential density characteristics.

2. Have high labor intensity.

3. Involve explosive, fire, toxic, corrosion or other hazardous characteristics.

4. Promote population concentration.

5. Involve utilities and services required for area-wide population where disruption would have an adverse impact (telephone, gas, etc).

6. Concentrate people who are unable to respond to emergency situations such as children, elderly, handicapped, etc.

7. Promote extended duration of population concentration.

8. Pose hazards to aircraft operations.

Accident Potential Zone I has compatibility with a wide variety of industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation and agricultural uses. However, uses that concentrate people in small areas are not acceptable. Structures should be located toward the edges of this zone whenever possible.

Accident Potential Zone II possesses lower accident potential, but nevertheless, the risk is still present. Acceptable uses include those of Accident Potential Zone I as well as low density single family residential, and those personal and business services and commercial/retail trade uses of low intensity or scale of operation. High density functions such as multi-story buildings, places of assembly (theaters, churches, schools, restaurants, etc.) and high density office uses are not considered appropriate.

High people densities should be limited to the maximum extent possible. The optimum density recommended for residential usage (where it does not conflict with noise criteria) in APZ II is one dwelling per acre. For most non-residential usage, buildings should be limited to one story and the lot coverage should not exceed 20%.

There is no question that these guidelines are relative. Ideally there should be no "people intensive uses" in either of these APZs. The free market and private property systems prevent this where there is land development demand. To go beyond these guidelines, however, increases risk substantially by placing more people in areas where there may ultimately be an aircraft accident.

With the exception of forestry activities and livestock farming, uses in the resources production, extraction and open space category are compatible almost without restriction.

NOISE

Nearly all studies on residential aircraft noise compatibility recommend no residential uses in noise zones above Day-Night Average Sound Level (DNL) 75 or its equivalent in other noise descriptor systems. Usually no restrictions are recommended below DNL 65. Between DNL 65-75 there is currently no consensus. These areas may not qualify for Federal mortagage insurance in residential categories according to HUD regulation. In many cases HUD approval requires noise attenuation measures, the Regional Administrator's concurrence and an Environmental Impact Statement. Past Air Force experience, and the lack of definitive criteria, does not justify an Air Force recommendation to categorically prohibit residential uses in these areas although these uses will often be quite undesirable. However, wherever possible residential use should be located below DNL 65.

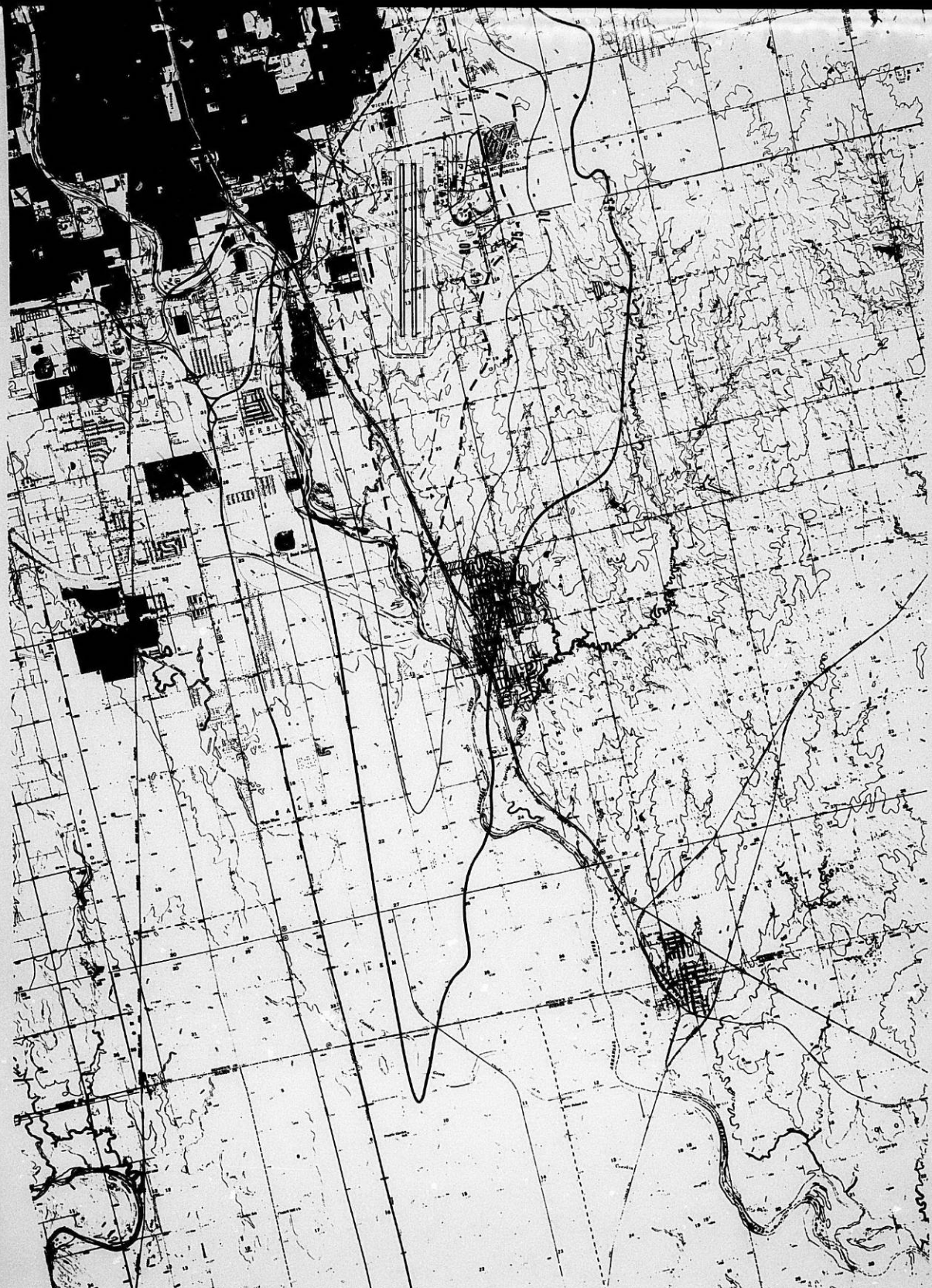
Most industrial/manufacturing uses are compatible in the airfield environs. Exceptions are uses (such as research or scientific activities) which require lower noise levels. Noise attenuation measures are recommended for portions of buildings devoted to office use, receiving the public or where the normal background noise level is low.

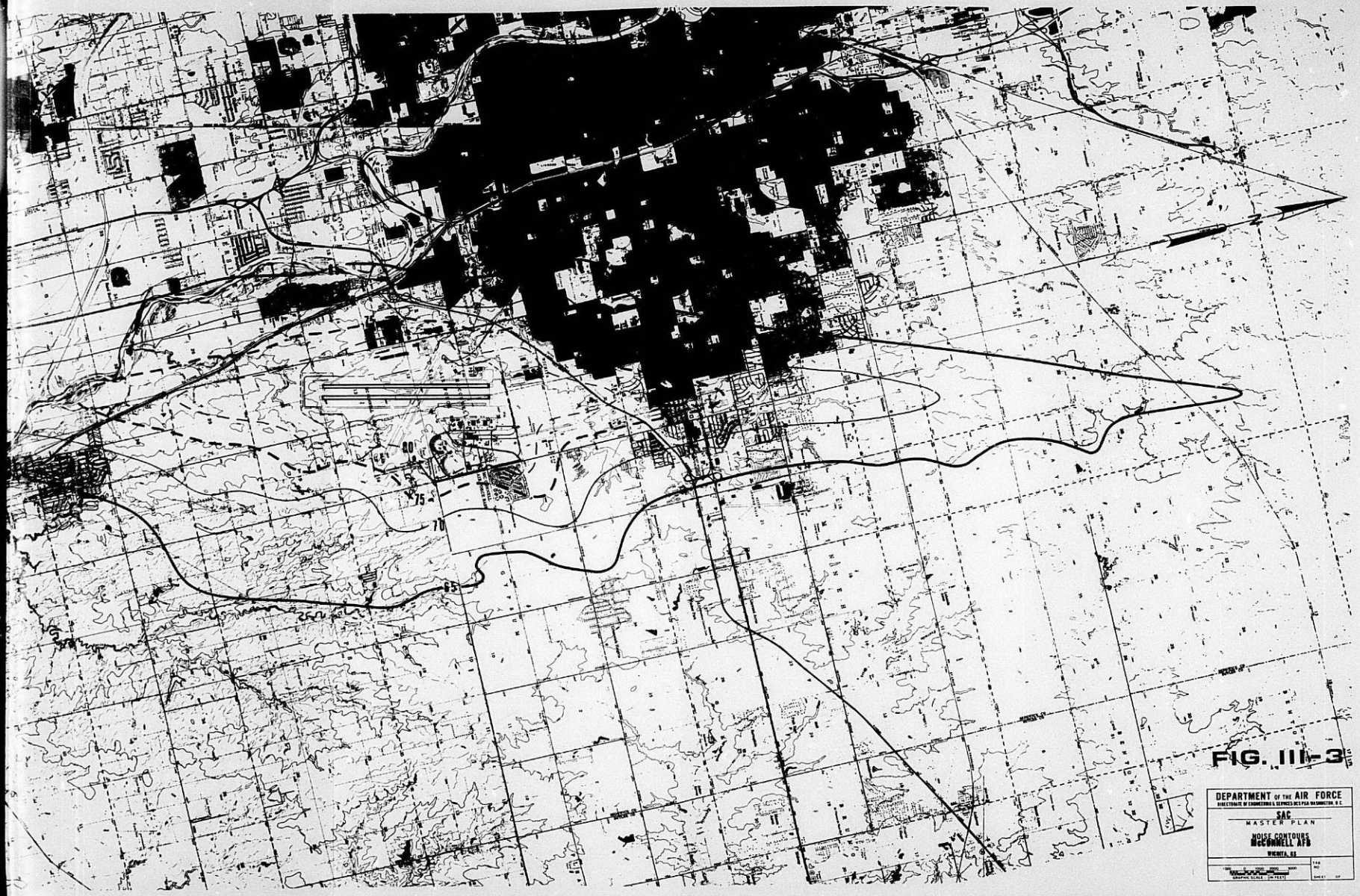
The transportation, communications and utilities categories have a high noise level compatibility because they generally are not people intensive. When people use land for these purposes, the use is generally very short in duration. Where buildings are required for these uses, additional evaluation is warranted.

The uses of commercial/retail trade and personal and business services categories are compatible without restriction up to DNL 70 however, they are generally incompatible above DNL 80. Between DNL 70-80, attenuation should be included in the design and construction of buildings.

The nature of most uses in the public and quasi-public services category requires a quieter environment, and attempts should be made to locate these uses below DNL 65, or else provide adequate attenuation.

Although recreational use has often been recommended as compatible with high noise levels, recent research has resulted in a more conservative view. Above DNL 75, noise becomes a factor which limits the ability to enjoy such uses. Where the requirement to hear is a function of the use (music shell, etc.), compatibility is limited. Buildings associated with golf courses and similar uses should be noise attenuated.

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McCONNELL AFB
WICHITA, KS
GRAPHIC SCALE - IN FEET

FIG. III-3

CHAPTER IV - THE MCCONNELL AIR FORCE BASE AICUZ

CHAPTER IV

THE AREA

The McConnell AFB AICUZ (Figure IV-1) and land-use guidelines (Figure IV-2) are similar to other land use determinants. Like any other factor in the planning process, the AICUZ depicts the relationship of aircraft operations to land use. The recommended AICUZ land-use guidelines are considered suitable for incorporation into the local planning process.

The boundaries of a compatible use (i.e., an AICUZ) for an airfield are dependent upon many factors affecting the public health, safety, and welfare (as discussed in Chapter III). Because land use planning must be comprehensive, it must embrace all areas affected by a given determinant.

One set of land use guidelines within a large compatible use area would be impractical and unreasonable. Recognizing this fact it is necessary to identify areas which adequately reflect the combined effects of noise, flight tracks, altitudes and accident potential. The term Compatible Use District (CUD) has been given the these areas with an AICUZ. In effect, a CUD is an area which possesses a distinct range of noise levels and specific accident potential. It is the basic "building block" for compatible land use. There are thirteen possible CUDs, of which 10(*) apply to the McConnell AFB AICUZ:

CUD 1	-	DNL 85+
*CUD 2	-	APZ I and DNL 80-85
*CUD 3	-	APZ I and DNL 75-80
*CUD 4	-	APZ I and DNL 70-75
CUD 5	-	APZ I and DNL 65-70
*CUD 6	-	DNL 80-85
*CUD 7	-	DNL 75-80
*CUD 8	-	APZ II and DNL 80-85
*CUD 9	-	APZ II and DNL 75-80
*CUD 10	-	APZ II and DNL 70-75
CUD 11	-	APZ II and DNL 65-70
*CUD 12	-	DNL 70-75
*CUD 13	-	DNL 67-70

Land use guidelines for each Compatible Use District are shown in Figure IV-2. These guidelines have been established on the basis of studies prepared or sponsored by several federal agencies, including the Department of Housing and Urban Development, the Environmental Protection Agency, and the U.S. Air Force, plus state and local agencies.

Because the types of land uses specified for each CUD are generalized (i.e.; Standard Land Use Classification), there may be specific uses that are appropriate even though the general use category is not, and vice-versa. Consequently, the table is only a guide and must be adapted to local conditions on a case-by-case basis. In the following section, existing and future land use compatibility determined through the application of these guidelines is discussed.

Land use planning and control is a dynamic rather than a "static" process. The specific characteristics of land use determinants will always reflect, to some degree, the changing conditions of the economic, social and physical environment of a community as well as changing public concern. The planning process accommodates this fluidity in that decisions are normally not based on rigid boundary line but rather on more generalized area designations.

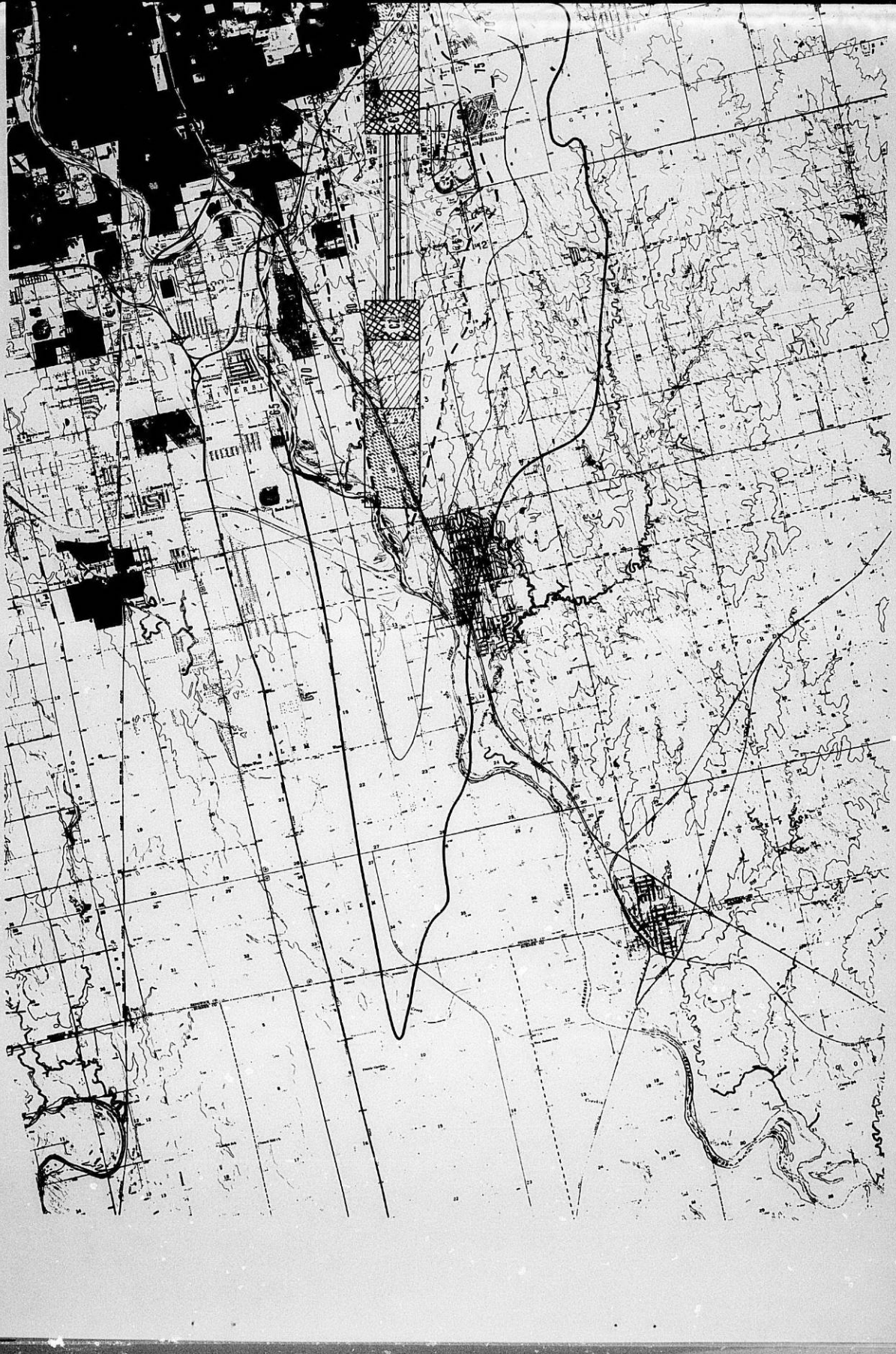
AICUZ boundaries/noise contours describe the impact of a specific operational environment and as such will change if a significant change is made operationally. If the local community attempts to use AICUZ boundaries as the boundary lines of zoning districts it is conceivable that problems will result. Such an attempt to solidify noise contour lines is not consistent with the above characteristics of planning. Additionally, the Air Force is recommending that AICUZ data be utilized with all other planning data. Specific land use control decisions will not, therefore, be based solely on AICUZ boundaries. The Air Force cannot guarantee that AICUZ boundaries (noise contours) will never change. It is reasonable to assume that any significant operational change (which would substantially modify the contours) would be subject to the Environmental Impact Statement requirement and thus be part of the continuing planning process.

In the following section, the analysis of existing and future compatibility, based on the application of these guidelines is discussed.

EXISTING AND FUTURE CONDITIONS WITHIN THE MCCONNELL AFB AICUZ

There are two basic types of land use problems in the vicinity of airports.. ..existing and possible. Most Air Force Bases are located such that development has not yet occurred to the degree that there is a substantial current problem.

However, areas north and northwest of McConnell have already been (or are being) developed in a land use pattern not always compatible with McConnell AFB operations.



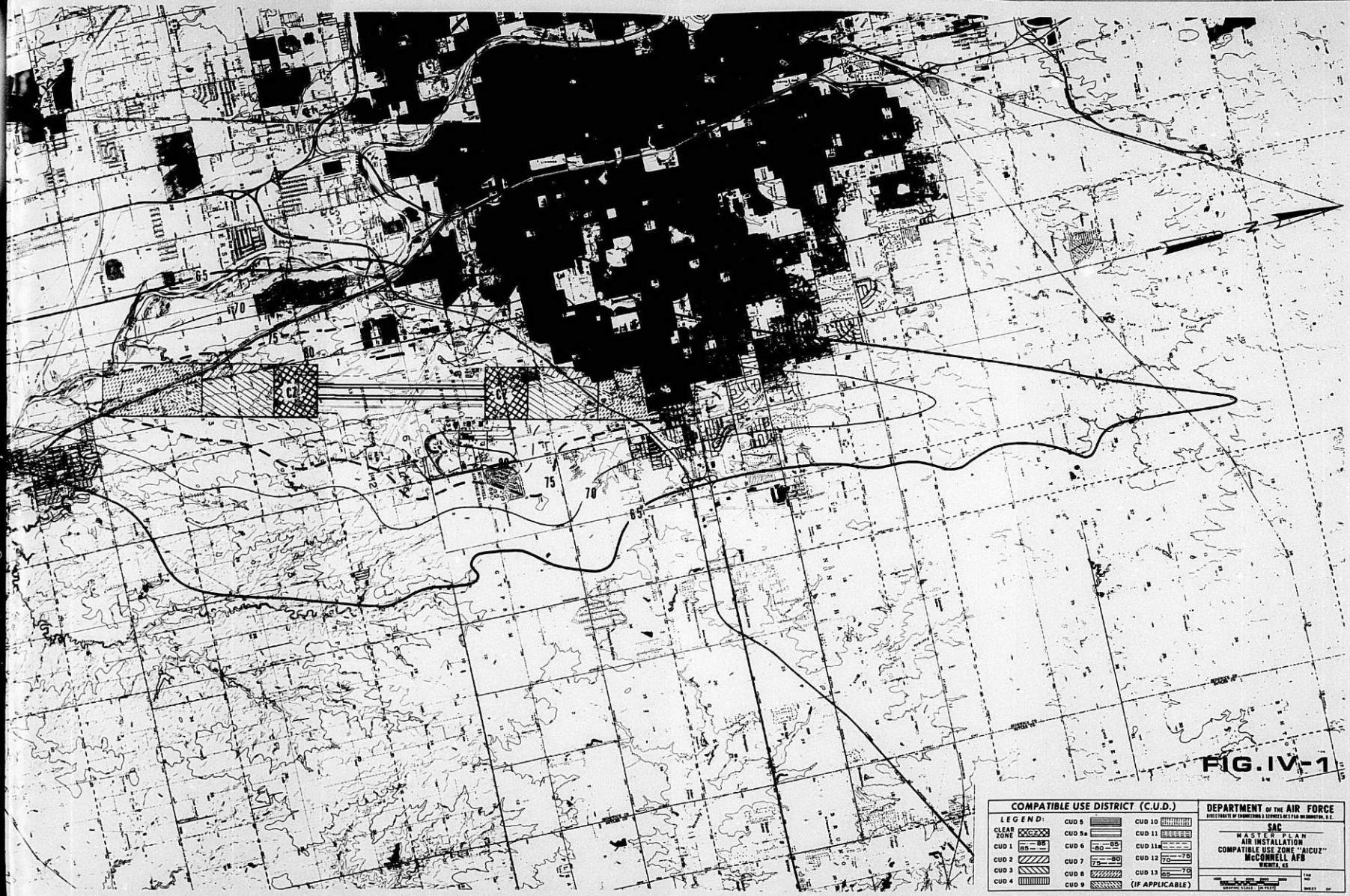

65
70
75
80
CZ
CZ
75
70
65
COMPATIBLE USE DISTRICT (C.U.D.)
LEGEND:
CLEAR ZONE
CUD 1
CUD 2
CUD 3
CUD 4
CUD 5
CUD 5a
CUD 6
CUD 7
CUD 8
CUD 9
CUD 10
CUD 11
CUD 11a
CUD 12
CUD 13
(IF APPLICABLE)
DEPARTMENT OF THE AIR FORCE
SAC
MASTER PLAN
AIR INSTALLATION
COMPATIBLE USE ZONE "AICUZ"
McCONNELL AFB
WICHITA, KS

FIG. IV-1

McConnell AFB presently is bordered on the west by Boeing Aircraft, on the north by Cessna Aircraft with commercial and residential use beyond and to the south and east by suburban and rural residential. The area to the west of the base is not in the regular flying pattern. Development directly to the west is primarily industrial. Further to the northwest is residential development and the City of Wichita. Directly north of the base. Beyond this to the north is a small amount of commercial with intense residential beyond. The development to the north of the Air Force Base has increased so rapidly within the past few years that potential problems may develop due to existing zoning and land use plans. The majority of the area to the east and south of McConnell AFB has been slow to develop.

SEDGWICK COUNTY AND THE CITY OF WICHITA:

Existing Land Use

The existing land uses in the area around McConnell AFB are shown in Figure IV-3. Currently there are industrial uses inside compatible use districts (CUDs) 2, 3, 6, 7, 23, and 13. These uses are generally compatible in all existing areas. Commercial activities exist in CUDs 7, 9, 10, 12, and 13. Most commercial uses are considered compatible if the buildings provide sufficient amounts of sound attenuation.

Residential uses are found inside CUDs 3, 4, 6, 7, 9, 10, 12 and 13. Residential uses are considered incompatible in CUDs 3, 4, 6, 7, and 9 because of the accident potential and high noise levels. In CUDs 10, 12 and 13 some residential uses may become compatible if the structures provide specific noise level reductions. Figure IV-2 gives detailed land use guidelines based on specific types of land use and compatible use districts.

As mentioned earlier, the Air Force has received Congressional authorization and funding to acquire the necessary real property interests for the clear zone areas. These real property interest will insure compatible land use in the clear zone.

Existing Zoning

Figure IV-4 depicts the existing zoning in the area around McConnell AFB. The areas zoned for industrial use include land inside CUDs 2, 3, 6, 7, 12, and 13. Industrial uses are considered generally compatible in all these districts.

Areas zoned for commercial use include land inside CUDs 3, 6, 7, 9, 10, 12, and 13. Most commercial uses are considered incompatible in CUDs 3 and 6 because of the accident potential and/or high noise levels. Commercial uses may be compatible in CUDs 7 and 9 with noise reduction of 25 dB. These uses are compatible in CUD 13. Refer to Figure IV-2 for further details.

Residential uses are permitted by existing zoning in CUDs 2, 3, 6, 7, 9, 10, 12, and 13. Because of the combinations of the accident potential and high noise levels these uses are considered incompatible in CUDs 2, 3, 6, 7, and 9. These areas are predominately east of the base with smaller areas to the north, west, and south. It is recommended that no further residential development proceed in these areas.

Residential use is strongly discourage in CUDs 10 and 12 and discouraged in CUD 13; however, these uses may be compatible if noise level reductions of 25 dB are provided in CUD 13. These areas are predominately east and north of the base with smaller areas to the west and south.

Future Land Use:

Figure IV-5 depicts the future land use around McConnell AFB. Generally the projected land use is compatible with the base flying operations. All of the projected industrial development is compatible. Most anticipated commercial development is also compatible. Those areas of future commercial use inside CUDs 7, 12, and 13 should incorporate sufficient levels of sound attenuation in building design and construction. Future residential developments inside CUDs 12 and 13 should include sound attenuation levels of at least 30 dB in CUDs 12 and 25 dB in CUD 13.

THE CITY OF DERBY:

A section of the northwest area of Derby extends into compatible use district 13. (See Figure IV-3) Industrial and commercial uses are compatible in this district. Residential uses are conditionally compatible. The existing zoning would allow further residential development in CUDs 12 and 13. (See Figure IV-4) A minimum noise level reduction of 30 dB is required for dwellings in CUDs 12 and 25 dB is required inside CUD 13 to insure compatibility guidelines.

The analysis of land use conditions in the McConnell AFB environs indicates that the major problem to be considered is the continued conversion of agricultural land to residential uses. As the county anticipates a sizable increase in population over the next two decades, there will be continued pressure for residential development.

SLUCM CODE	LAND USE CATEGORY	COMPATIBLE USE DISTRICTS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
		Ldn 85	APZ I Ldn 80-85	APZ I Ldn 75-80	APZ I Ldn 70-75	APZ I Ldn 65-70	Ldn 80-85	Ldn 75-80	APZ II Ldn 80-85	APZ II Ldn 75-80	APZ II Ldn 70-75	APZ II Ldn 65-70	Ldn 70-75	Ldn 65-70
	RESIDENTIAL													
11x	Single Family	N	N	N	N	N	N	N	N	N	$30^{1,2}$	$25^{1,2}$	30^{2}	25^{2}
11x	Two Family	N	N	N	N	N	N	N	N	N	N	N	30^{2}	25^{2}
11x	Multi-family dwelling	N	N	N	N	N	N	N	N	N	N	N	30^{2}	25^{2}
12	Group quarters	N	N	N	N	N	N	N	N	N	N	N	30^{2}	25^{2}
13	Residential hotels	N	N	N	N	N	N	N	N	N	N	N	30^{2}	25^{2}
14	Mobil home parks or courts	N	N	N	N	N	N	N	N	N	N	N	30^{2}	25^{2}
15	Transient lodging - hotels, motels	N	N	N	N	N	N	35^{2}	N	N	N	N	30^{2}	25^{2}
19	Other residential	N	N	N	N	N	N	N	N	N	N	N	30^{2}	25^{2}
	INDUSTRIAL/MANUFACTURING[3]													
21	Food and kindred product	N	N	N	N	N	Y^{4}	Y^{5}	Y^{4}	Y^{5}	Y^{6}	Y	Y^{6}	Y
22	Textile mill products	N	N	N	N	N	Y^{4}	Y^{5}	N	N	N	N	Y^{6}	Y
23	Apparel	N	N	N	N	N	Y^{4}	Y^{5}	N	N	N	N	Y^{6}	Y
24	Lumber & wood products	N	Y^{4}	Y^{5}	Y^{6}	Y	Y^{4}	Y^{5}	Y^{4}	Y^{5}	Y^{6}	Y	Y^{6}	Y
25	Furniture & fixtures	N	Y^{4}	Y^{5}	Y^{6}	Y	Y^{4}	Y^{5}	Y^{4}	Y^{5}	Y^{6}	Y	Y^{6}	Y
26	Paper & allied products	N	Y^{4}	Y^{5}	Y^{6}	Y	Y^{4}	Y^{5}	Y^{4}	Y^{5}	Y^{6}	Y	Y^{6}	Y
27	Printing, publishing	N	Y^{4}	Y^{5}	Y^{6}	Y	Y^{4}	Y^{5}	Y^{4}	Y^{5}	Y^{6}	Y	Y^{6}	Y
28	Chemicals & allied products	N	$Y^{3,4}$	$Y^{3,5}$	$Y^{3,6}$	Y^{3}	Y^{4}	Y^{5}	$Y^{3,4}$	$Y^{3,5}$	$Y^{3,6}$	Y^{3}	Y^{6}	Y
29	Petroleum refining and related industries	N	N	N	N	N	Y^{4}	Y^{5}	N	N	N	N	Y^{6}	Y

This table is a guide. Adaptations to fit local conditions and more precise land use category designations are required based on the criteria of the foregoing narrative.

Figure IV-2 Land Use Compatibility Guidelines

SLUCM* CODE	LAND USE CATEGORY	COMPATIBLE USE DISTRICTS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
		L_{dn} 85	APZ I L_{dn} 80-85	APZ I L_{dn} 75-80	APZ I L_{dn} 70-75	APZ I L_{dn} 65-70	L_{dn} 80-85	L_{dn} 75-80	APZ II L_{dn} 80-85	APZ II L_{dn} 75-80	APZ II L_{dn} 70-75	APZ II L_{dn} 65-70	L_{dn} 70-75	L_{dn} 65-70
	INDUSTRIAL/MANUFACTURING[3]													
31	Rubber & misc plastic	N	Y[4]	Y[5]	Y[6]	Y	Y[4]	Y[5]	Y[4]	Y[5]	Y[6]	Y	Y[6]	Y
32	Stone, clay & glass products	N	Y[4]	Y[5]	Y[6]	Y	Y[4]	Y[5]	Y[4]	Y[5]	Y[6]	Y	Y[6]	Y
33	Primary metal industries	N	Y[4]	Y[5]	Y[6]	Y	Y[4]	Y[5]	Y[4]	Y[5]	Y[6]	Y	Y[6]	Y
34	Fabricated metal products	N	Y[4]	Y[5]	Y[6]	Y	Y[4]	Y[5]	Y[4]	Y[5]	Y[6]	Y	Y[6]	Y
35	Professional, scientific & controlling instru	N	N	N	N	N	N	30	N	N	N	N	25	Y
39	Misc manufacturing	N	Y[4]	Y[5]	Y[6]	Y	Y[4]	Y[5]	Y[4]	Y[5]	Y[6]	Y	Y[6]	Y
	TRANSPORTATION, COMMUNI-CATIONS & UTILITIES[7]													
41	Railroad, rapid rail transit	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
45	Highway & street ROW	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46	Auto parking	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
47	Communications (noise sensitive)	N	N	30	25	Y	N	30	N	30	25	Y	25	Y
48	Utilities	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
42/43	Other trans, comm, & util	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

This table is a guide. Adaptations to fit local conditions and more precise land use category designations are required based on the criteria of the foregoing narrative.

Figure IV-2 Land Use Compatibility Guidelines

SLUCM CODE*	LAND USE CATEGORY	COMPATIBLE USE DISTRICTS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
		L_{dn} 85	APZ I L_{dn} 80-85	APZ I L_{dn} 75-80	APZ I L_{dn} 70-75	APZ I L_{dn} 65-70	L_{dn} 80-85	L_{dn} 75-80	APZ II L_{dn} 80-85	APZ II L_{dn} 75-80	APZ II L_{dn} 70-75	APZ II L_{dn} 65-70	L_{dn} 70-75	L_{dn} 65-70
	PERSONAL & BUSINESS[8] SERVICES (Cont)													
	Indoor recreation services	N	N	N	N	N	N	30	N	30	25	Y	25	Y
69	Other services	N	N	N	N	N	N	30	N	30	25	Y	25	Y
	PUBLIC & QUASI PUBLIC SERVICES													
67	Government services	N	N	N	N	N	N	30	N	30[8]	25[8]	Y[8]	25	Y
68	Educational services	N	N	N	N	N	N	N	N	N	N	N	30	25
711	Cultural activities incl churches	N	N	N	N	N	N	N	N	N	N	N	30	25
651	Medical & other health services[9]	N	N	N	N	N	N	N	N	N	N	N	30	25
624	Cemeteries	Y	Y[4,10]	Y[5,10]	Y[6,10]	Y[10]	Y[4]	Y[5]	Y[4,10]	Y[5,10]	Y[6,10]	Y[10]	Y[6]	Y
69x	Non profit organization	N	N	N	N	N	N	N	N	N	N	N	30	25
	Other public and quasi-public services	N	N	N	N	N	N	N	N	N	30	25	30	25
	OUTDOOR RECREATION													
761x	Playgrounds, neighborhood parks	N	N	N	N[11]	N[11]	N	N	N	N	Y	Y	Y[11]	Y
762x	Community & regional	N	N	N	Y[11]	Y[11]	N	N	N	N	Y	Y[11]	Y[11]	Y

This table is a guide. Adaptations to fit local conditions and more precise land use category designations are required based on the criteria of the foregoing narrative.

Figure IV-2 Land Use Compatibility Guidelines

* SLUCM CODE	LAND USE CATEGORY	COMPATIBLE USE DISTRICTS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
		L_{dn} 85	APZ I L_{dn} 80-85	APZ I L_{dn} 75-80	APZ I L_{dn} 70-75	APZ I L_{dn} 65-70	L_{dn} 80-85	L_{dn} 75-80	APZ II L_{dn} 80-85	APZ II L_{dn} 75-80	APZ II L_{dn} 70-75	APZ II L_{dn} 65-70	L_{dn} 70-75	L_{dn} 65-70
	OUTDOOR RECREATION (Cont)													
712	Nature exhibits	N	N	N	N	Y	N	N	N	N	N	Y	N	Y
722	Spectator sports incl arenas	N	N	N	N	N	N	N	N	N	N	N	N	Y
741x	Golf course[12], riding stables[13]	N	N	Y^{14}	Y^{15}	Y	N	Y^{14}	N	Y^{14}	Y^{15}	Y	Y^{15}	Y
743/ 744	Water based recreational areas	N	N	Y^{14}	Y^{15}	Y	N	Y^{14}	N	Y^{14}	Y^{15}	Y	Y^{15}	Y
75	Resort & group camps	N	N	N	N	N	N	N	N	N	N	N	Y	Y
721x	Auditoriums, concert halls	N	N	N	N	N	N	N	N	N	N	N	N	Y
721x	Outdoor amphitheaters, music shells	N	N	N	N	N	N	N	N	N	N	N	N	N
	Other outdoor recreation	N	N	N	Y^{11}	Y^{11}	N	N	N	N	N	N	N	N
	RESOURCE PRODUCTION, EXTRACTION, & OPEN SPACE													
81	Agriculture (except livestock)	Y^{17}	Y^{17}	Y^{17}	Y^{18}	Y^{19}	Y^{17}	Y^{17}	Y^{17}	Y^{17}	Y^{18}	Y^{19}	Y^{18}	Y^{19}
815/ 817	Livestock farming, animal breeding	N	N	Y^{17}	Y^{18}	Y^{19}	N	Y^{17}	N	Y^{17}	Y^{18}	Y^{19}	Y^{18}	Y^{19}
83	Forestry activities	Y^{17}	Y^{17}	Y^{17}	Y^{18}	Y^{19}	Y^{17}	Y^{17}	Y^{17}	Y^{17}	Y^{18}	Y^{19}	Y^{18}	Y^{19}

This table is a guide. Adaptations to fit local conditions and more precise land use category designations are required based on the criteria of the foregoing narrative.

Figure IV-2 Land Use Compatibility Guidelines

SLUCM* CODE	LAND USE CATEGORY	COMPATIBLE USE DISTRICTS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
		Ldn 85	APZ I Ldn 80-85	APZ I Ldn 75-80	APZ I Ldn 70-75	APZ I Ldn 65-70	Ldn 80-85	Ldn 75-80	APZ II Ldn 80-85	APZ II Ldn 75-80	APZ II Ldn 70-75	APZ II Ldn 65-70	Ldn 70-75	Ldn 65-70
	COMMERCIAL/RETAIL TRADE													
51	Wholesale trade	N	Y[4]	Y[5]	Y[6]	Y	Y[4]	Y[5]	Y[4]	Y[5]	Y[6]	Y	Y[6]	Y
52	Building materials-retail	N	Y[4]	Y[5]	Y[6]	Y	Y[4]	Y[5]	Y[4]	Y[5]	Y[6]	Y	Y[6]	Y
53	General merchandise-retail	N	N	N	N	N	N	30	N	30	25	Y	25	Y
54	Food-retail	N	N	N	N	N	N	30	N	30	25	Y	25	Y
55	Automotive, marine	N	N	30	25	Y	N	30	N	30	25	Y	25	Y
56	Apparel & accessories - retail	N	N	N	N	N	N	30	N	30	25	Y	25	Y
57	Eating & drinking places	N	N	N	N	N	N	30	N	N	N	N	25	Y
58	Furniture, home furnishing retail	N	N	30	25	Y	N	30	N	30	25	Y	25	Y
59	Other retail trade	N	N	N	N	N	N	30	N	30	25	Y	25	Y
	PERSONAL & BUSINESS[8] SERVICES													
61	Finance, insurance & real estate[8]	N	N	N	N	N	N	30	N	30	25	Y	25	Y
62	Personal services	N	N	N	N	N	N	30	N	30	25	Y1	25	Y
63	Business services	N	N	N	N	N	N	30	N	30	25	Y	25	Y
64	Repair services	N	Y[4]	Y[5]	Y[6]	Y	Y[4]	Y[5]	Y[4]	Y[5]	Y[6]	Y	Y[6]	Y
66	Contract construction services	N	N	N	N	N	N	30	N	30	25	Y	25	Y

This table is a guide. Adaptations to fit local conditions and more precise land use category designations are required based on the criteria of the foregoing narrative.

Figure IV-2 Land Use Compatibility Guidelines

SLUCM CODE*	LAND USE CATEGORY	COMPATIBLE USE DISTRICTS												
		1	2	3	4	5	6	7	8	9	10	11	12	13
		L_{dn} 85	APZ I L_{dn} 80-85	APZ I L_{dn} 75-80	APZ I L_{dn} 70-75	APZ I L_{dn} 65-70	L_{dn} 80-85	L_{dn} 75-80	APZ II L_{dn} 80-85	APZ II L_{dn} 75-80	APZ II L_{dn} 70-75	APZ II L_{dn} 65-70	L_{dn} 70-75	L_{dn} 65-70
	RESOURCE PRODUCTION, EXTRACTION, & OPEN SPACE (Cont)													
84	Fishing activities & related services	Y	Y[11]	Y[11]	Y[11]	Y[11]	Y	Y	Y	Y	Y	Y	Y	Y
85	Mining activities	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
91	Permanent open space	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
93	Water areas	Y	Y[11]	Y[11]	Y[11]	Y[11]	Y	Y	Y[11]	Y[11]	Y[11]	Y[11]	Y	Y

This table is a guide. Adaptations to fit local conditions and more precise land use category designations are required based on the criteria of the foregoing narrative.

Figure IV-2 Land Use Compatibility Guidelines

NOTES

N (NO) - The land use and related structures are not compatible and should be prohibited.

Y (YES) - The land use and related structures are compatible without restriction and should be considered.

Y^x (YES WITH RESTRICTIONS) - The land use and related structures are generally compatible; however, some special factors should be considered.

35, 30 or 25 - The land use is generally compatible; however, a Noise Level Reduction of 35, 30 or 25 must be incorporated into the design and construction of the structure.

35^x, 30^x, or 25^x - The land use is generally compatible with NLR; however, such NLR does not necessarily solve noise difficulties and additional evaluation is warranted.

1 - Because of accident hazard potential, the residential density in these CUD's should be limited to the maximum extent possible. It is recommended that residential density not exceed one dwelling unit per acre. Such use should be permitted only following a demonstration of need to utilize this area for residential purposes.

2 - Although it is recognized that local conditions may require residential uses in these CUD's, 11 and 13. The absence of viable alternative development options should be determined and an evaluation indicating that a demonstrated community need for residential use would not be met if development were prohibited in these CUD's should be conducted prior to approvals. Where the community determines that residential uses must be allowed Noise Level Reductions (NLR) of at least 30 (CUD's 10 and 12) and 25 (CUD's 11 and 13) should be incorporated into building codes and/or individual approvals. Additional consideration should be given to modify the NLR levels based on peak noise levels. Such criteria will not eliminate outdoor environment noise problems and, as a result, site planning and design should include measures to minimize this impact particularly where the noise is from ground level sources.

3 - Because these uses vary considerably by locality and within a general category, particular care should be taken to evaluate and modify guidelines to fit local conditions. Among factors to be considered: Labor intensity, structural coverage explosive inflammable characteristics, size of establishment, people density, peak period (including shopper/visitors) concentrations.

4 - A NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas or where the normal noise level is low.

5 - A NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas or where the normal noise level is low.

6 - A NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas or where the normal noise level is low.

7 - No structures in Clear Zone, no passenger terminals, and no major ground transmission lines in Clear Zones or APZ I.

8 - Low intensity office uses only (limited scale of concentration of such uses), Meeting places, auditoriums, etc. not recommended.

9 - Excludes hospitals.

10 - Excludes chapels.

11 - Facilities must be low intensity.

12 - Clubhouse not recommended.

13 - Concentrated rings with large classes not recommended.

14 - A NLR of 30 must be incorporated into buildings for this use.

15 - A NLR of 25 must be incorporated into buildings for this use.

16 - No structures in Clear Zone.

17 - Residential structures not permitted.

18 - Residential buildings require a NLR of 30.

19 - Residential buildings require a NLR of 25.

* SLUCM: STANDARD LAND USE MANUAL: A standard system for identifying and coding land use activities. Department of Commerce 1965.

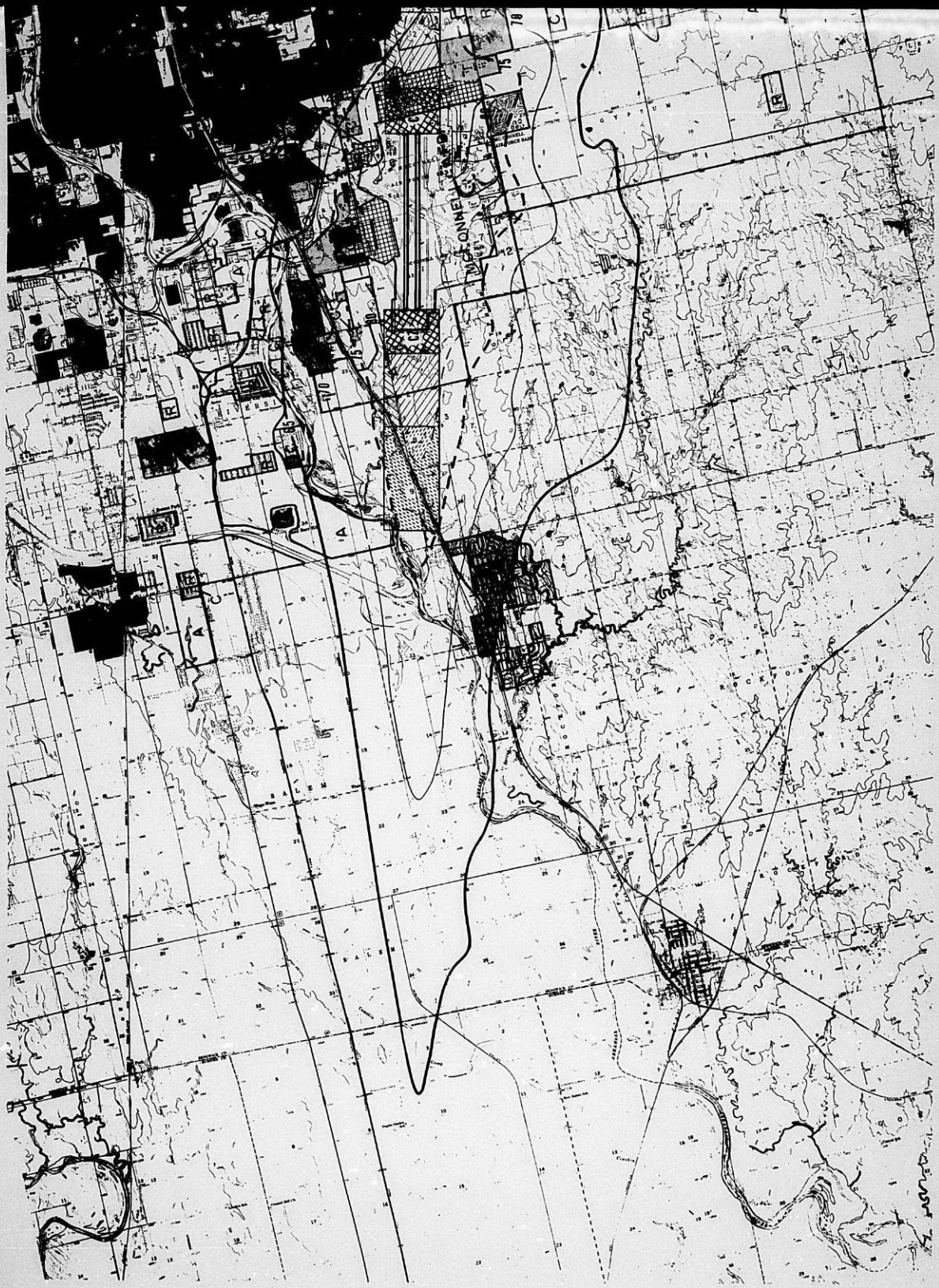
INFORMATION SUMMARY FOR MAPS

Maps IV-3 and IV-4 represent a close proximity to the actual land use occuring in the city of Wichita at present.

IV-5 represents only probable changes to existing land use and zoning for the future, in and near the McConnell noise contours.

LEGEND FOR FIGURES IV-3 through IV-5

Symbol	
A	Agricultural
R	Residential (Single & Multi)
C	Commercial (Business & Industrial)


CONNELL
SALEM

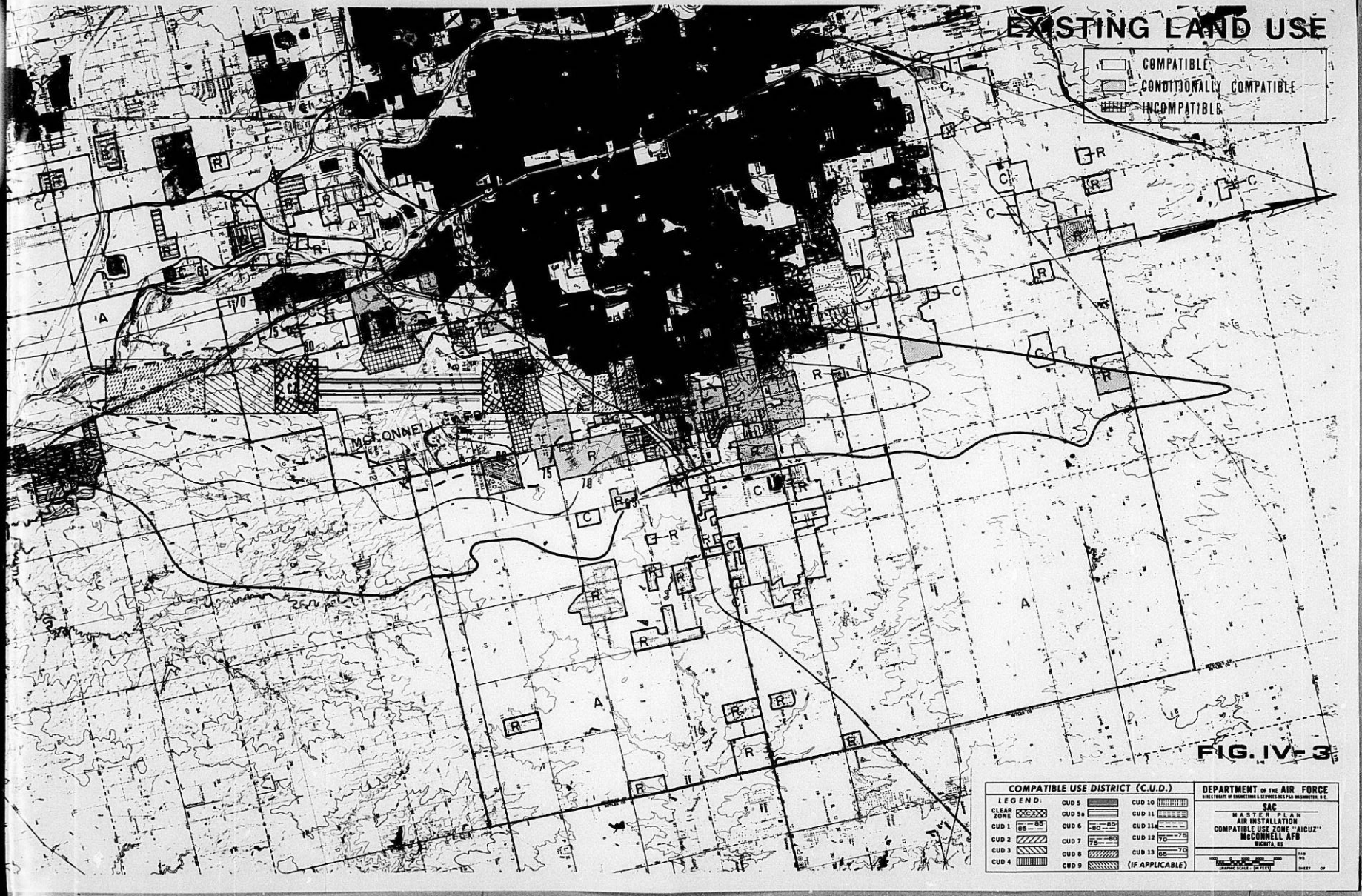


FIG. IV-3

COMPATIBLE USE DISTRICT (C.U.D.)

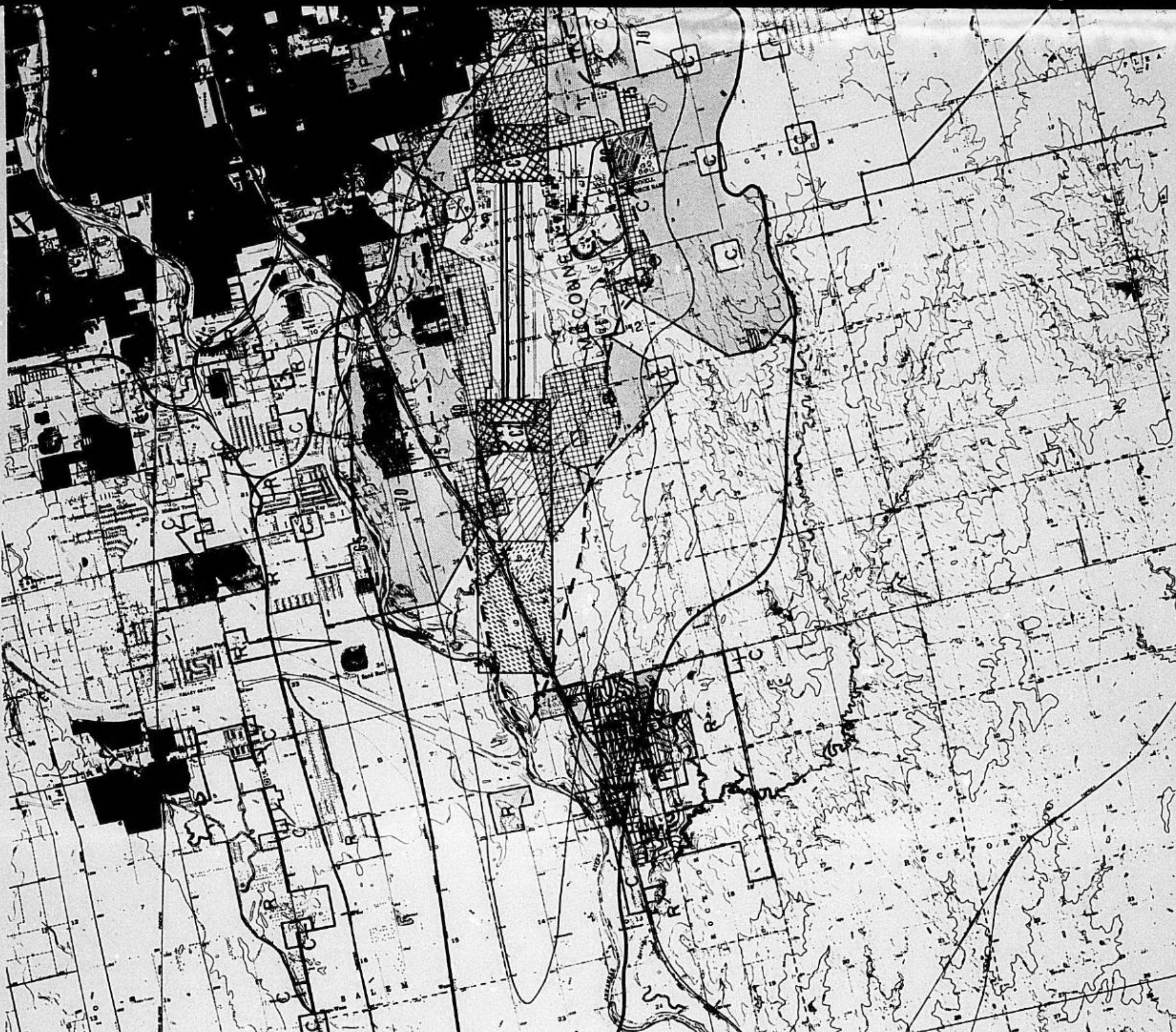
LEGEND:

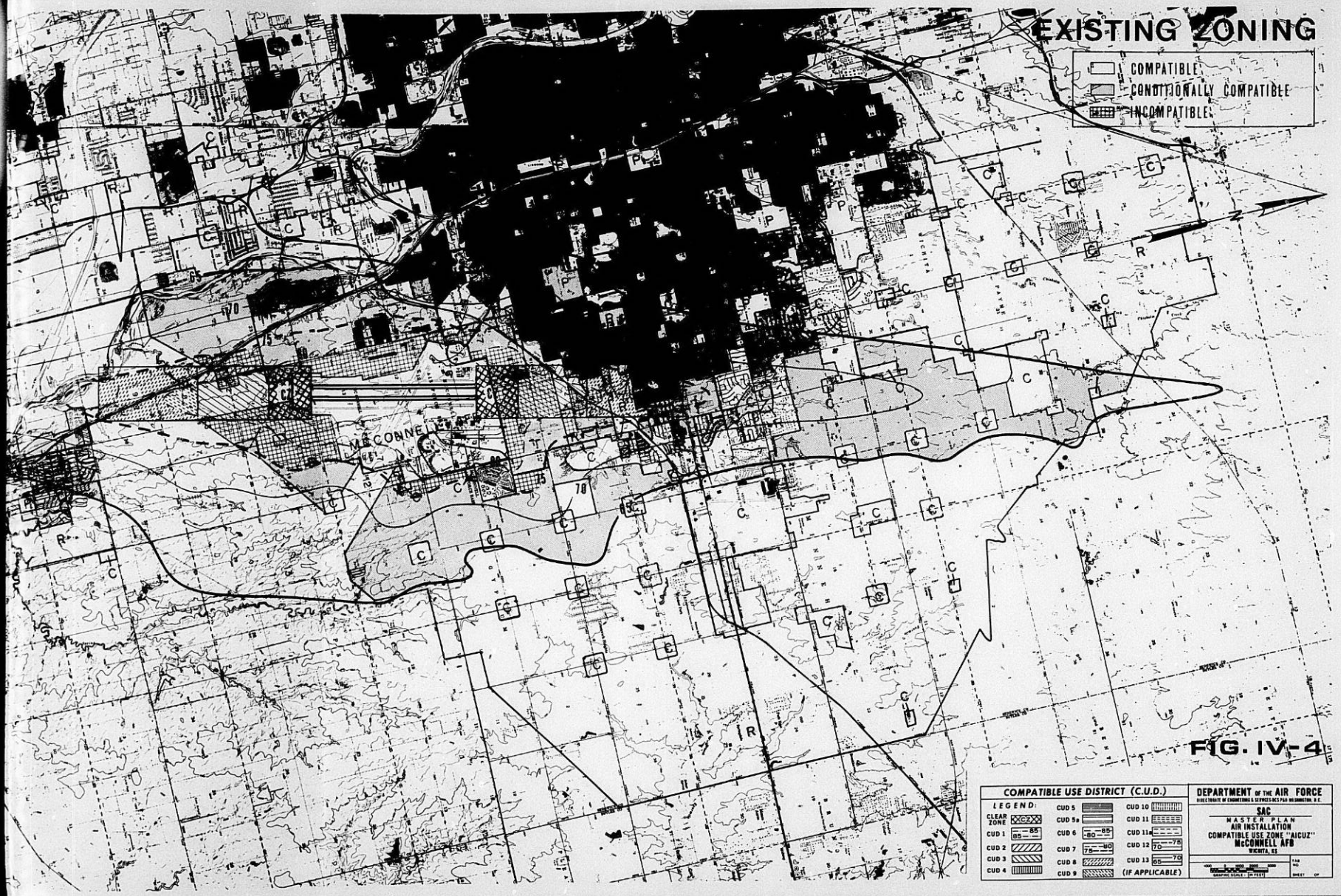
CLEAR ZONE — C2
CUD 1 — 65–85
CUD 2
CUD 3
CUD 4
CUD 5
CUD 5a
CUD 6 — 80–85
CUD 7 — 75–80
CUD 8 — 70–75
CUD 9 (IF APPLICABLE)
CUD 10
CUD 11
CUD 11a
CUD 12 — 70–75
CUD 13 — 65–70

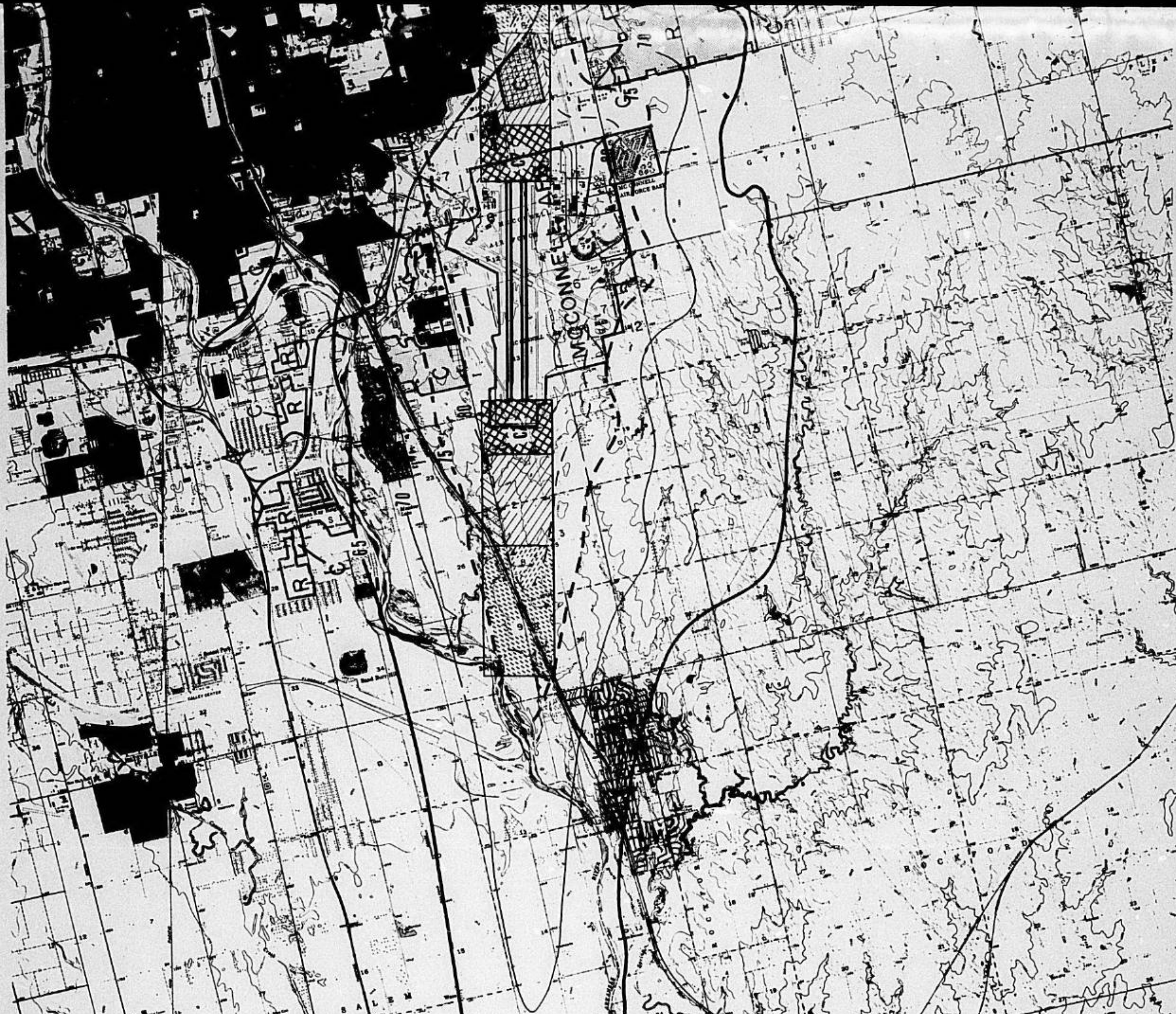
DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF ENGINEERING & SERVICES-DES PAR WASHINGTON, D.C.

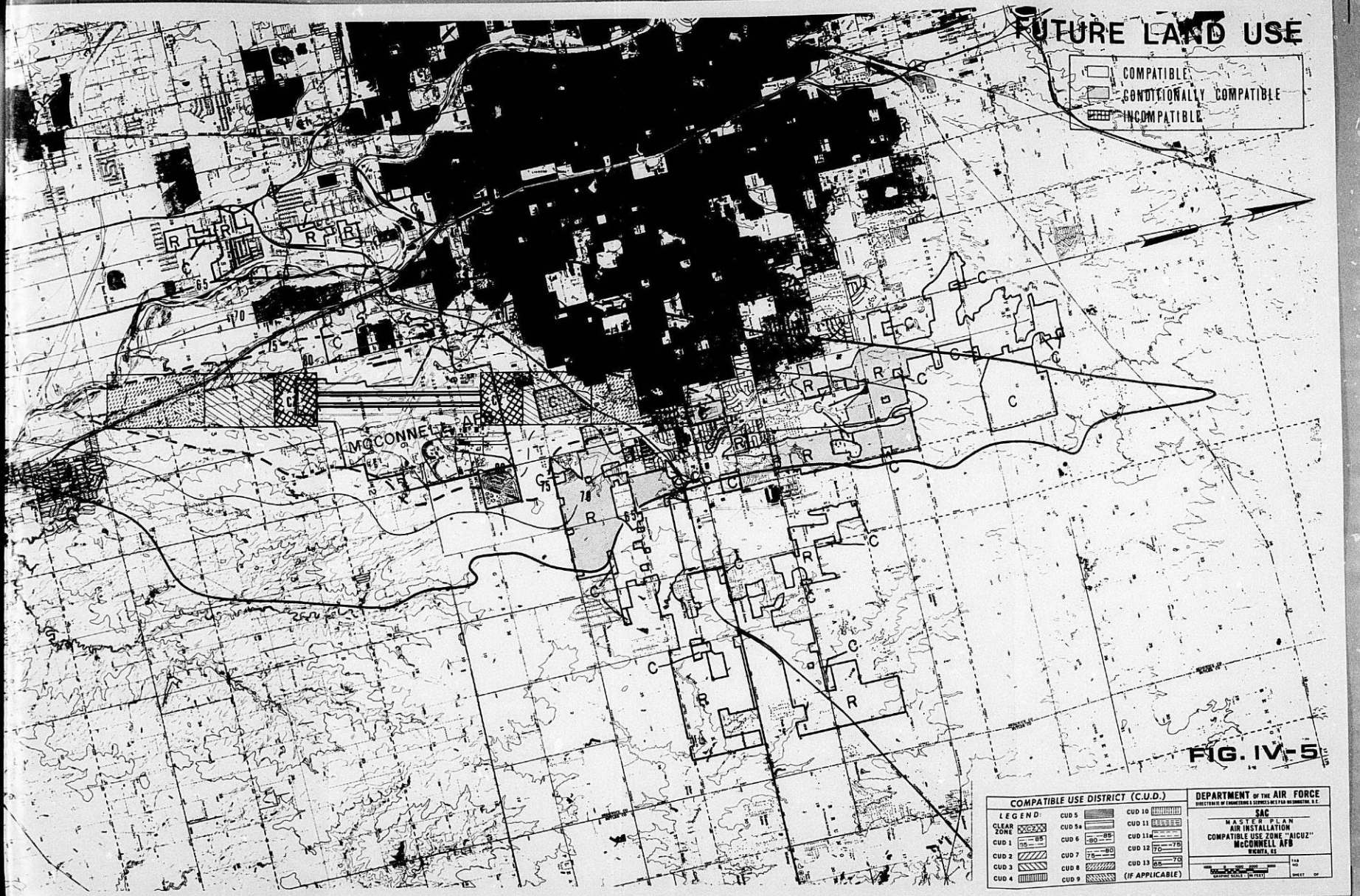
SAC
MASTER PLAN
AIR INSTALLATION
COMPATIBLE USE ZONE "AICUZ"
McCONNELL AFB
WICHITA, KS

GRAPHIC SCALE - IN FEET


SALEM
ROCKFORD


EXISTING ZONING
COMPATIBLE
CONDITIONALLY COMPATIBLE
INCOMPATIBLE
MCCONNE
FIG. IV-4
COMPATIBLE USE DISTRICT (C.U.D.)
LEGEND:
CLEAR ZONE
CUD 1
CUD 2
CUD 3
CUD 4
CUD 5
CUD 5a
CUD 6
CUD 7
CUD 8
CUD 9
CUD 10
CUD 11
CUD 11a
CUD 12
CUD 13
(IF APPLICABLE)
DEPARTMENT OF THE AIR FORCE
SAC
MASTER PLAN
AIR INSTALLATION
COMPATIBLE USE ZONE "AICUZ"
McCONNELL AFB
WICHITA, KS


SALEM
ROCKFORD
GYPSUM


FUTURE LAND USE
COMPATIBLE
CONDITIONALLY COMPATIBLE
INCOMPATIBLE
MCCONNELL AFB
N
FIG. IV-5
COMPATIBLE USE DISTRICT (C.U.D.)
LEGEND:
CLEAR ZONE
CUD 1
CUD 2
CUD 3
CUD 4
CUD 5
CUD 5a
CUD 6
CUD 7
CUD 8
CUD 9
CUD 10
CUD 11
CUD 11a
CUD 12
CUD 13
(IF APPLICABLE)
DEPARTMENT OF THE AIR FORCE
SAC
MASTER PLAN
AIR INSTALLATION
COMPATIBLE USE ZONE "AICUZ"
McCONNELL AFB
WICHITA, KS

CHAPTER V - AIR FORCE RESPONSIBILITIES

V. AIR FORCE RESPONSIBILITIES

GENERAL

The air Force views its responsibilities in the AICUZ process as being two-fold. The first of these responsibilities is to insure that all possible steps have been taken to reduce the noise impact generated by aircraft operations. The second is to be an active and willing participant in an ongoing cooperative planning process through which compatible development plans are generated by the local community.

In fulfillment of the first responsibility McConnell AFB has always participated in the noise abatement program by continually evaluating its operational procedures to determine if all steps have been taken to reduce the impact of McConnell operations on adjacent land areas. A summary of these evaluations follows.

CURRENT NOISE ABATEMENT PROCEDURES
(See Appendix G)

In conducting the McConnell AFB operational modification evaluations, various alternatives involving alterations to existing flight paths were evaluated. This extensive evaluation has indicated that some alterations could be made and still be consistent with safe conduct of the McConnell AFB mission. These alterations are summarized in Appendix G and have been incorporated within the Flight Track and Noise Contour maps in this report.

In an effort to reduce the noise level as much as possible traffic patterns have been changed to minimize traffic over the most populated area of eastern Wichita and the patterns to the south have been changed to avoid flying over Derby. Flights have been minimized during the late evening or early morning hours.

PARTICIPATION IN THE PLANNING PROCESS

The preparation and presentation of this McConnell AFB AICUZ report is a continuing phase of Air Force participation in the local planning process. It is recognized that as the local community prepares its land use plans, the Air Force must be ready to provide additional inputs. In view of this requirement, the office of the Base Civil Engineer has been designated as the official liaison with the local community on all planning matters. Personnel from this office will be responsible for collecting and conveying any additional AICUZ data the community may require. They will also be prepared to participate in any meetings involving AICUZ related land use plans.

It is also recognized that the AICUZ program will be an on-going activity even after compatible development plans are adopted and implemented. In recognition of this requirement, the Civil Engineer's Office is prepared to participate in the continuing discussion of zoning and other land use matters as they may effect McConnell AFB.

It is recommended that a re-evaluation of existing comprehensive plans be conducted to investigate the possibilities of re-orienting residential development away from the areas of greatest conflict. Any re-evaluation of existing plans or zoning should include AICUZ guidelines as part of land use determinants. It is also recommended that during the immediate future, conversion of vacant land be held to a minimum until the optimum pattern is defined.

CHAPTER VI - COMMUNITY RESPONSIBILITIES

VI. COMMUNITY RESPONSIBILITIES

The implementation of the AICUZ study should be a joint effort between the Air Force and adjacent communities of the McConnell AFB operations. The role of the communities is to insure that development of the environs is compatible with accepted planning and development principles and practices.

The McConnell AFB AICUZ affects the political jurisdictions of the City of Wichita and Derby, Sedgwick, and Sumner Counties to the extent that revisions to zoning ordinances, height controls, comprehensive plans, subdivision regulations and building codes should be considered. In addition, it is recommended that a Fair Disclosure Ordinance be considered and that Capital Improvement Programs be reviewed to encourage compatible land use patterns.

The analysis of land use conditions in the McConnell AFB environs indicates that the major problem to be considered is the continued conversion of agricultural land to residential uses. As the county anticipates a sizable increase in population over the next two decades, there will be continued pressure for residential development.

One of the best mechanisms for alleviating, or at least limiting, compatibility conflicts in areas such as CUDs 12 and 13 is the use of construction noise attenuation. Therefore it is recommended that local building codes be reviewed and modified to insure that adequate Noise Level Reduction measures are required in all new construction. See Appendix F.

With reference to height limitations as defined in Appendix E, it is recommended that Sedgwick County and the City of Wichita incorporate the height standards shown in this section into their comprehensive land use plans. The county and city should insure that these height limitations are part of their zoning ordinances.

It is further recommended that the criteria recommended for AICUZ in the McConnell AFB environs be considered for incorporation into comprehensive plans and zoning ordinances used to evaluate further land use requests.

It therefore seems appropriate that re-evaluations of county plans be conducted, incorporating the AICUZ development guidelines, to explore the possibility for redirecting growth away from the areas of greatest conflict. Where the conflicts exist in CUDs 12 and 13, these conflicts can be alleviated, or at least partially resolved, if noise attenuation measures are required for all new construction. Local building codes should be reviewed and modified to achieve the necessary degree of Noise Level Reduction.

APPENDIX A

APPENDIX A

The McConnell AFB Mission

GENERAL

The multi-missioned Air Force Base known today as McConnell is the outgrowth of the original municipal airport established by the air minded citizens of Wichita in 1928. Today McConnell is literally a small community within itself, although many of its people live off base. The 381st Strategic Missile Wing is the host organization at McConnell AFB. The complicated hardware and awesome power of their deterrent weapon, the Titan II Intercontinental Ballistic Missile, are important to the Strategic Air Command mission of deterring aggression. The Wing's mission is that of contributing to the credibility of SAC and all United States' nuclear strike forces. The 381st maintains an ever alert force of nuclear weapons so powerful that the possibility of their retaliation is a deterrent to any potential aggressor to the United States. The challenging job of keeping the Titan II ready for immediate launch belongs to the four man combat crews who serve 24 hour alert tours in the Wing's 18 missile sites scattered around Wichita, buried beneath the plains of Kansas.

384th Air Refueling Wing - The flying mission of McConnell AFB is to be prepared to rendezvous and refuel airborne aircraft any time day or night when the need exists.

Primarily, a constant alert commitment is maintained to support SAC B-52 operations in the event of general war. To fulfill this important obligation the Alert Facility keeps track of each alert crew at all times. The crews are restricted to certain areas on base where they are in visual and audible proximity to the familiar red and white SAC ALERT sign with its disquieting klaxon horn.

Within 5 minutes of the initial klaxon blast, the first of the KC-135 tankers rolls down the runway followed at minimum interval by the remaining aircraft.

Loaded with over 150,000 pounds of JP-4 jet fuel, these flying gas stations can keep SAC's bombers airborne indefinitely if need be. As single manager for the Air Force tanker fleet, SAC wings, use the military version of Boeing 707 to refuel tactical aircraft from the Air Force and its sister services as well.

The 184th Tactical Fighter Group was originally federally recognized as the 127th Observation Squadron and located at the Wichita Municipal Airport on 4 August 1941. The unit was ordered to active duty during World War II and served as both an observation squadron and a liaison squadron for the U.S. Army Air Corps. Following World War II the unit was reorganized and redesignated as the 127th Fighter Squadron and assigned the F-51 "Mustang" aircraft. Since that time the unit has flown the F-84 "Thunder Jet", F-80 "Shooting Star", F-86 "Sabre Jet" and the F-100 "Super Sabre". During that period the unit was activated twice; in October 1950 for the Korean Conflict and in January 1968 following the North Koreans' seizure of the USS Pueblo during the Vietnam Conflict.

In March of 1971 the 184th Tactical Fighter Group was reorganized and redesignated the 184th Tactical Fighter Training Group and assigned thirty-two F-105 "Thunder Chief" aircraft. In its newly assigned mission the unit provided combat crew training in the F-105 for the Air National Guard, the Air Force Reserve and the U.S. Air Force. The unit was again redesignated in October 1979 as the 184th Tactical Fighter Group and assigned the expanded mission of a Replacement Training Unit with thirty-six F-4D "Phantom" aircraft.

381st Combat Support Group - Provides housekeeping and service functions vital to the operation of the base. The functions of the Group are perhaps the most diversified of any unit on McConnell. The primary mission is the support of the Strategic Missile Wing activities. Secondary missions include search and rescue activities in support of local Base Rescue Plans, Disaster Control Operations, and the National Search and Rescue Plan. Det 6 utilizes UH-1F and UH-1H model HUEY Helicopters to accomplish these missions.

427 OLA (ATC) Field Training Detachment - Provides KC-135 systems training for maintenance personnel assigned to the 384th Air Refueling Wing.

Detachment 23, 26th Weather SQ (MAC) - Provides and arranges for weather support, and airweather service to the 381st Strategic Missile Wing and the 384th Air Refueling Wing.

819th Civil Engineering Squadron Heavy Repair - Provides mobile civil engineering unit, manned, trained, and equipped to perform heavy repairs and upgrade airfields and facilities to support weapons systems deployed to a theatre of operations. The 819th was deployed in August 1979 to a threatre of operations in Weathersfield, England.

These essential mission activities require numerous personnel to maintain and operate the facilities and provide services and materials to support operation of aviation activities and units of the operating force at McConnell AFB.

APPENDIX B

APPENDIX B

ECONOMIC IMPACT STUDY

McConnell AFB is a significant part of the Wichita community. It is natural that each should wonder what effect one has on the other. Wichita supports McConnell and its personnel with available housing to buy or rent, a great variety of stores, varied recreation and community activities, and a work force for the civilian jobs. In short, Wichita makes McConnell AFB a much nicer place to be assigned.

What effect does McConnell have upon Wichita? The money spent and the jobs available on the base are easily measured, but economists agree that the economic impact is always larger than the direct figures show. Every dollar brought into the community is spent several times thus magnifying its effect. This is called the turnover factor. It means that the money to pay McConnell's utility bills helps pay the salaries of utility employees, who then pay rent, buy gasoline, etc. The Wichita Area Chamber of Commerce uses a turnover rate of 5.0; the Strategic Air Command uses a more conservative rate of 2.5.

McConnell AFB directly hires approximately 750 full time civilian employees through several programs. In addition to these primary jobs, McConnell also creates secondary jobs. These are the extra gas station attendants, cosmetologists, store clerks and the various businesses that are able to make a living because of the additional military and their families that are required to live here. The Air Force estimates, based on the number and salaries of Air Force personnel, that approximately 4,000 additional jobs are indirectly created by the presence of McConnell AFB.

Therefore, the actual economic impact can be compared to an iceberg. There is so much directly visible on the surface, and much more hidden below. All figures contained in this study are actual. Turnover factors have not been applied to the dollar amounts; therefore, the 17 million dollars in local contracts awarded added at least 40 million dollars to the local economy in that category alone.

The total military and civilian payroll at McConnell AFB is more than 56 million dollars. All civilians and 3/4 of the military live off base. Even those living on base spend a significant amount in Wichita. Locally awarded contracts exceeded 11 million dollars; aviation fuels were thirteen million. That comes to approximately 86 million dollars annual. Multiply this figure by the SAC conservative turnover factor for 215 million dollars annual financial impact.

McConnell has created approximately 4,060 jobs in Wichita and 342 in the surrounding smaller communities. The estimated total gross salaries are another 38½ million dollars.

The total economic impact of McConnell AFB on the greater Wichita area was at least 190 million dollars in FY 1977.

McConnell personnel dependents attend the Derby School system. The 1976-77 official count of the Air Force families attending was approximately 25 percent of total district enrollment of 1,289. The federal government provides funds through Public Law 874 for students of the military. The district received $956,575.96. Additional amounts were received from the State of Kansas.

The Wichita Public School System received $599,199.24 in federal funds for the children of military and federal employees attending school in the area.

LOCALLY AWARDED CONTRACTS

FY 80

Supplies and Equipment	$ 4,881,812
Services	3,723,486
Construction and Engineering	6,731,307
Other	244,299
TOTAL	$15,580,904

AIR FORCE MOTOR VEHICLE INVENTORY

	AUTH	ASGD
General Purpose	281	305
Special Purpose	98	89
Base Maintenance	42	52
Material Handling	22	22
TOTAL	443	468

CONSTRUCTION PROJECTS

AS OF: 30 SEPTEMBER 1980

FY 80 - Funded by Base Operations & Maintenance, Military Family Hsg, Hospital

DESCRIPTION	AMOUNT FUNDED
A. MEDICAL	
Repair Parking Lot	9.0
Replace Air Conditioning System	362.4
Oxygen & Vacuum System	10.0
TOTAL	381.4
B. NONAPPROPRIATED FUNDS (NAF)	
Carwash	58.3
C. MILITARY FAMILY HOUSING (MFH)	
Exterior Paint Capehart	18.2
Gas Regulators Repair	47.6
Replace Furnaces	39.7
Replace Sump Pumps	49.0
Repair Patio Stoops	51.8
Paint Interior Appropriated Housing	8.3
Roof Repair Capehart	236.8
Carport Repair	129.4
Driveway Repair	53.0
Sidewalk Repair	21.0
Exterior Paint Capehart	39.5
Road Sealing MFH	58.6
Patios, Driveway & Walks	79.1
Exterior Trim Painting	60.2
Interior Paint MFH	89.8
Install Air Purifier	0.7
Fireplace Addition	4.8
Interior Paint MFH	57.6
TOTAL	1045.5
D. BASE	
Air Condition, Bldg 1218	93.1
Replace Electrical Switching Station	291.7
Repair Fire Alarms	200.0
Repair Roofs Various Facilities	475.7
Clean Silo Sump (532-8)	19.7
Repair Paint Spray Booth	41.9
Repair Heat System Condensate Lines	276.1
Emergency Roof Repair, Bldg 1106	120.0
Taxiway Pavements No. 1	237.1
Heat System Condensate Lines	104.5
Taxiway Pavements No. 1, Phase 2	62.2
TOTAL	1922.0
E. TOTAL FY 80	3407.2

DOLLAR RESOURCES

AS OF 30 SEPTEMBER 1980

Host & Tenant

CAPITAL ASSETS (Includes missile complexes)		$197,919,352
WEAPON SYSTEM		
Missiles - Titan II	$153,400,000	
Aircraft		
KC-135	193,200,000	
F-4D	159,600,000	
T-37	1,600,000	
HH-1H	3,600,000	
AIRCRAFT TOTAL	$511,400,000	
COMMUNICATIONS & ELECTRONICS (Titan Communications Only)	$ 9,544,000	
WEAPON SYSTEM TOTAL		$520,944,000
EQUIPMENT		$ 56,523,803
INVENTORIES		
Stock Fund	$ 11,581,902	
AAFES	850,000	
Nonappropriated Funds	159,070	
TOTAL INVENTORIES		$ 12,590,972
TOTAL RESOURCES		$789,978,127

EXPENDITURE FOR PAYROLL AND BASE OPERATION AND MAINTENANCE (OBAN 6792)

PAYROLL (GROSS) FY 80 (1 OCT 79 - 30 SEPT 80)		
Military	$ 41,570,960	
Civil Service	7,468,155	
Nonappropriated Fund	1,250,354	
AAFES	587,963	
TOTAL PAYROLL		$ 50,877,432
BASE OPERATIONS & MAINTENANCE (Less Civilian Pay)		$ 13,159,017
TOTAL EXPENDITURES		$ 64,036,449

MANPOWER DATA

APPROPRIATED FUND EMPLOYEES	NUMBER HOST	TENANT	TOTAL
Military	2,927	1,062	3,989
Civil Service	423	368	791
Foreign National	---	---	---
TOTAL	3,350	1,430	4,780

NONAPPROPRIATED FUND EMPLOYEES	
Nonappropriated Fund (Full Time)	61
AAFES	26
ADDITIONAL PERSONNEL - (DEPENDENTS)	
Officer	1,161
Enlisted	3,336
CONTRACTOR	255
BASE TOTAL	9,619

APPENDIX C

APPENDIX C

Accident Potential Study

One of the most important milestones of accident hazard analysis took place in 1952 with the publication of The Airport and Its Neighbors. This report of the President's Airport Commission, better known as the Doolittle Report, has several significant recommendations on the subject of airport hazard:

> 4. Incorporate cleared runway extension areas into airports. The dominant runways of new airport projects should be protected by cleared extensions at each end and at least one-half mile in length and 1000 feet wide. This area should be completely free from housing or any other form of obstruction. Such extensions should be considered an intergral part of the airport.
>
> 5. Establish effective zoning laws. A fan-shaped zone, beyond the half-mile cleared extension described in recommendation 4, at least two miles long and 6000 feet wide at its outer limits should be established at new airports by zoning law, air easement or land purchase at each end of dominant runways. In this area, the height of buildings and also the use of land should be controlled to eliminate the erection of places of public assembly, churches, hospitals, schools, etc., and to restrict residence to the more distant locations within the zone.

These recommendations were based on the knowledge that accident risk was greater in these areas than others. It was an attempt to define a relative, acceptable risk. The Doolittle Report criteria served as the general basis for the original Air Force Greenbelt and AICUZ concepts of 1971 and 1972, although the lines were somewhat different from those of FAA and Air Force criteria. Fan shaped approach-departure zones were used to a point 2½ miles from the threshold and divided into two parts: the first 2500 feet was Zone I and the remainder was Zone 2.

The use of these fan shaped zones posed a fundamental problem. It became apparent when Air Force past accidents were plotted. The occurrence of accidents simply did not fall neatly within the zones. The approach-departure zones excluded some accident intensive areas while they included some areas with little or no risk.

In mid 1973, the Air Force performed an Air Force wide accident hazard study. Its purpose was to identify land areas near airports with significant aircraft accident potential. The study covered the period 1968 through 1972 and involved the review of reports on 369 major accidents that occurred within a ten nautical mile radius of airfields and were related to airfield associated in flight mishaps.

The analysis revealed the following basic findings:

1. Accident potential increases significantly near the extended runway centerline.

2. Seventy-five percent of the accidents plotted were near the extended runway centerline.

3. Fighter and training type aircraft account for over 80% of all major USAF accidents.

4. Of the 369 accidents plotted, 84 (22.8%) occurred on or adjacent to the runway (an area 2000 feet wide from threshold to threshold).

5. Nearly 61% of the accidents occurred during the landing phase as compared to 39% for the takeoff phase.

6. Almost 70% of the accidents occurred during daylight hours.

7. Seventy-five percent of the accidents resulted in definable debris impact areas. The impact areas varied in size for each type of aircraft as well as the phase of flight during which the accident occurred. By using weighted averages for impact areas resulting from approach and departure accidents and grouping these by class of aircraft, it was determined that the average impact area per accident was 5.06 acres. Figures varied from 2.73 acres for trainer and miscellaneous, aircraft to 8.73 acres for the heavy bombers of the transport/tanker/bomber class.

ACCIDENT POTENTIAL ANALYSIS

As previously stated, the purpose of the Air Force wide study was to define accident potential zones based on the locations of post accidents. The methodology employed the plotting of accidents for all aircraft by four classes: (1) fighter, (2) trainer/miscellaneous, (3) tanker/transportation, and (4) bomber. These classes were selected because of aircraft size, speed, operational characteristics and procedures.

Because accidents cluster somewhat along the extended runway centerline, a tabulation was prepared to describe the cumulative frequency of accidents as a function of distance from the runway threshold along the extended runway centerline for widths of 2000, 3000, and 4000 feet.

The objective was to identify significant patterns of accident occurrence related to area. In other words, the result must show the maximum percentage concentration of accidents in the smallest area. Figure C-1 depicts the cumulative percentage of accidents for all four aircraft types as a function of length and width of the area along the extended runway centerline. This indicates that the optimum width to include the maximum percentage of accidents in the smallest area is 3,000 feet. Looking at distance from the threshold, curves rise very rapidly the first 3,000 feet, found out more gradually from 3,000 to 8,000 feet and then rise more gradually from 8,000 to 15,000 feet where they level off with very little slope. In other words, a zone extending beyond 15,000 feet does not include significant additional accidents and curves below this point appear to be well represented by three zones.

Optimum Zones were then determined by minimizing the area necessary to include significant percentages of accidents. Zone lengths of 3,000, 8,000 and 15,000 feet were used because they correspond to the break points of the curves in Figure C-1. These zones and their respective accident percentages are shown in Figure C-2.

Separate analysis were conducted to determine the validity of the zones for each of the four classes of aircraft. A chi-square analysis indicated that accident occurrence variation from one zone to another was within the acceptable range with the exception of fighter and trainer aircraft in the 3,000 x ,000 foot clear zone which should be only 2,000 feet wide for these aircraft. At McConnell AFB the high frequency of tanker aircraft movements generates the requirement for 3,000 foot wide zones for each runway.

BASIC LAND USE COMPATIBILITY

There are two primary considerations in defining statistically valid zones: (1) the relationship of accident occurrence to land area and (2) the relationship of a single crash to the area impacted.

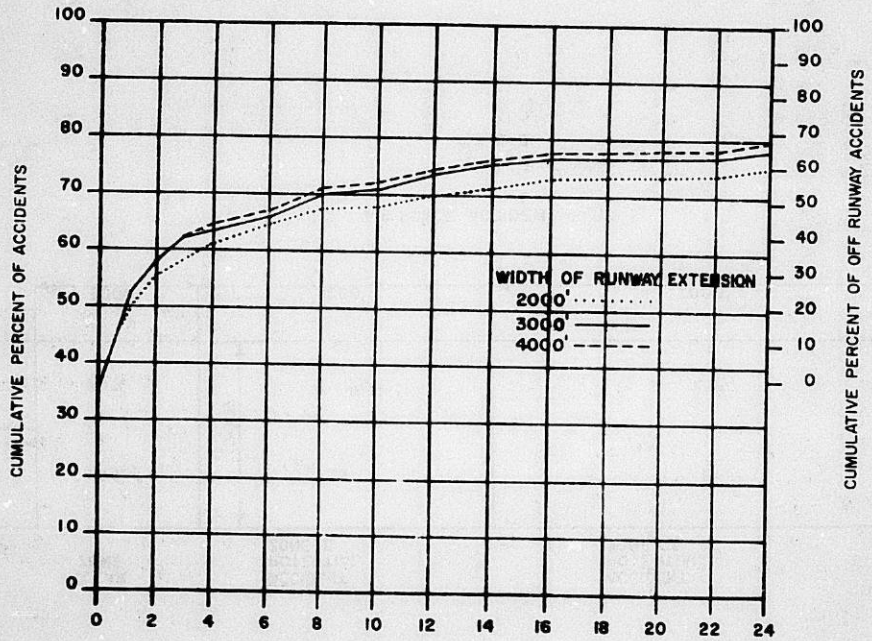
At the outset of the above referenced analysis, it was determined that the difficulties associated with producing statistically valid probabilities precluded their use. The variables are so numerous and difficult to apply to a given installation that almost any result would be subject to much discussion and controversy. However, this does not preclude the development of planning criteria based upon the employment of descriptive statistics.

Therefore, it was decided to express accident occurrence in terms of the relationships between impact points and the areas of the accident zones. Figure C-3 describes these relationships. Because the objective is to produce a relative index by which land use decisions can be made, a simple procedure is paramount. The result is accident occurrence versus area scale. It is first necessary to record basic area and accident data (columns 1-5). Then the ratio of percent of total accidents to percent of total area is computed (column 6).

In each case, the ratio of percent total accidents to percent total area is highest for the clear zone. Thus, a Hazard Index (HI) of 100 is assigned to the Clear Zone. Using column 6 for the Clear Zone as the base, the Hazard Index can then be expressed as the ratio of column 6 for each area to that of the Clear Zone. There exists an established land use standard for areas adjacent to runways--that of no buildings, structures or habitation except those to directly support flying operations. Therefore, the range between this HI and 100 determines the area for this standard.

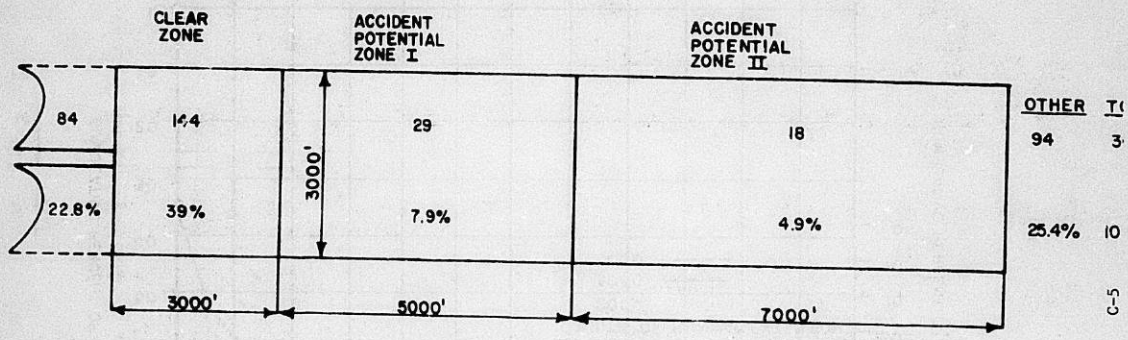
Using Figure C-3 as an example, the Clear Zone is described by HI of 100 (Column 7). The HI for the area adjacent to the runway is 50 (138/278). The HIs for zones 1 and 2 are 12 and 5 respectively.

The HIs drop appreciably for zones 2 and 3. The HI for the remaining area within the airport environs is inconsequential. It is therefore impractical to suggest any land use control on the basis of accident hazard outside these three zones.



DISTRIBUTION OF AIR FORCE AIRCRAFT ACCIDENTS WITHIN 10 NM OF A BASE.

FIG. C-1



AIR FORCE ACCIDENT DATA

FIG. C-2

HAZARD ANALYSIS USING AIR FORCE DATA (SEE FIGURE C-2)

	1/ AREA* (ACRES)	2/ NUMBER OF ACCIDENTS	3/ ACCIDENTS PER ACRE	4/ PERCENT TOTAL ACRE	5/ PERCENT TOTAL ACCIDENTS	6/ RATIO OF % ACCIDENTS TO % AREA	7/ HAZARD INDEX **
RUNWAY	487	84	1 Per 5.8 AC	.165	22.8	138	50
CLEAR ZONE	413.5	144	1 Per 2.87 AC	.140	39	278	100
APZ I	638.5	29	1 Per 23.7 AC	.233	7.9	34	12
APZ II	964.2	18	1 Per 53.6 AC	.327	4.9	15	5
OTHER	292,483	94	1 Per 3111 AC	99.133	25.4	0.26	.09
TOTAL	295,036.2	369	N/A	100	100.0	N/A	N/A

* Area includes land within 10 nautical miles of runway.

** Hazard Index is calculated by (1) dividing each figure in Column 6 by ratio of % accidents/% area for Clear Zone and (2) multiplying that number by 100.

FIGURE C-3

APPENDIX D

APPENDIX D
DESCRIPTION OF THE NOISE ENVIRONMENT

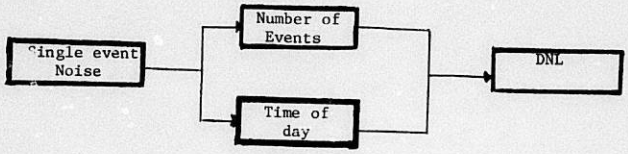
Noise Contours:

In a study of airport and aircraft noise, two different types of noise measures are needed - one to measure the noise of individual noise events such as the noise of an individual aircraft flyover, and another to describe the noise environment resulting from a complex of noise events, such as the total noise effect of aircraft operations at an air base.

Noise Environment Descriptor:

The methodology used to produce the noise contours contained in this study consists of the Day-Night Average Sound Level (DNL) system to depict the noise environment. This method of assessing the noise impact of aircraft operations on the area surrounding airports is replacing the Noise Exposure Forecast (NEF) which was used on an interim basis by the Air Force to replace the Composite Noise Rating (CNR) system which was published by the Air Force in 1964. Continuing efforts to improve the CNR procedure over the last ten years resulted in the development of NEF. Efforts to provide a national uniform standard for noise assessment have recently resulted in the announcement by the Environmental Protection Agency that DNL is a recommended procedure. In the same way as CNR, NEF and DNL are methods of assessing the amount of exposure to aircraft noise and predicting the community response to the various levels of exposure. The DNL values used for planning purposes and for which contours are shown in the body of this report are 65, 70, 75, and 80. Land use guidelines are based on the compatibility of various land uses with these noise exposure levels. For broad planning purposes NEF 30, DNL 65 and CNR 100 may be considered equivalent, as may NEF 40, DNL 75 and CNR 115. However, due to technical differences in the three systems direct comparison of conversion from one system to another can be misleading and is not recommended.

It is generally recognized that a noise environment descriptor should consider, in addition to the annoyance of a single event, the effect of repetition of such events and the time of day in which these events occur. As is typical of the various systems in use throughout the world today, DNL begins with a single event descriptor and adds corrections for the number of events and the time of day. Since the primary development concern is residential, nighttime events are considered more annoying than daytime events and are weighted accordingly. DNL values are computed from the single event noise descriptor plus corrections for number of flights and time of day.

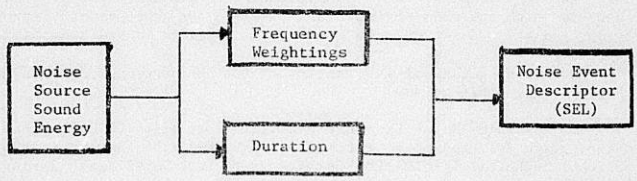


As part of an extensive data collection process, detailed information is gathered on the flight tracks flown by each type of aircraft assigned to the base and the number and time of flights on each of these tracks during a "typical" day. This information is used in conjunction with the single event noise descriptor to produce DNL values. These values are combined on an energy summation basis to provide single DNL values for the mix of aircraft operations at the base. Equal value points are connected to form the contour lines.

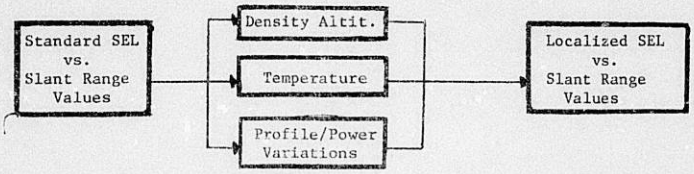
In contrast to the more familiar system of noise assessment, CNR, the DNL system's accuracy is increased since the resulting noise contours are based on incremental numbers of aircraft on each flight track rather than the step function correction factors used by CNR.

Noise Event Descriptor:

The single event noise descriptor used in the DNL system is the Sound Exposure Level (SEL). The SEL measure is a single value resulting from an analysis in 1/3 or full octave bands of the peak sound energy with consideration included which account for the duration of the sound within these bands, or can be measured with a sound level meter using an "A" weighting. Frequency, magnitude and duration vary according to aircraft type, engine type, and power setting. Therefore, individual aircraft noise data are collected for various types of aircraft/engines at different power settings and phases of flight. The following diagram shows the relationship of the single event noise descriptor (SEL) to the source sound energy.



SEL vs. slant range values are derived from noise measurements made according to a source noise data acquisition plan developed by Bolt, Beranek and Newman, Inc. in conjunction with the Air Force Aerospace Medical Research Laboratory (AMRL) and carried out by AMRL. These standard day, sea level values form the basis for the individual event noise descriptors at any location and are adjusted to the location by applying appropriate corrections for temperature, density altitude and variations from standard profiles and power settings.



Ground-to-ground sound propagation characteristics are used for altitudes up to 500 feet absolute with a linear transition between 500 and 700 feet and air-ground propagation characteristics above 700 feet.

In addition to the assessment of aircraft flight operations, the DNL system also incorporates aircraft and engine ground runup noise resulting from engine/aircraft maintenance checks on the ground. Data concerning the orientation of the noise source, type of aircraft or engine, number of test runs on a "typical" day, the power settings used and their duration, and use of suppression devices are collected for each ground runup or test position. This information is processed and the noise contribution added (on an energy summation basis) to the noise generated by flying operations to produce DNL contours reflecting the overall noise environment with respect to aircraft air and ground operations.

Noise Contour Production:

Data describing flight tracks, flight profiles, power settings, flight path and profile utilization, and ground runup information by type aircraft/engine is assembled by the individual Air Force base. These data are screened by the major command, Headquarters Air Force, and trained personnel processing the data for input into a central computer. Flight track and utilization data are loaded into the computer and flight track check plots are generated for verification by the base and major command. After verification and incorporation of any required changes, DNL contours are generated by the computer using the base-supplied operational data, and the standard source noise data corrected to local conditions. The computer system plots these contours which are then reviewed and prepared for photographic reproduction by specialists. A set of such contours is provided in the body of this report.

Additional technical information on the DNL procedure is available in the following publications:

1. Community Noise Exposure Resulting form Aircraft Operations: Application guide for Predictive Prodedure, AMRL-TR-73-105, November 1974 from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151.

2. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with Adequate Margin of Safety, EPA Report 550/9-74-004, March 1974, from Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

APPENDIX E

APPENDIX E

HEIGHT AND OBSTRUCTIONS CRITERIA

General. This appendix establishes criteria for determining whether an object or structure is an obstruction to air navigation. Obstructions to air navigation are considered to be:

1. Natural objects or manmade structures that protrude above the planes or surfaces as defined in the following paragraphs, and/or

2. Manmade objects that extend more than 500 feet above the ground at the site of the structure.

Explanation of Terms. The following will apply:

1. Controlling Elevation. Where surfaces or planes within these criteria overlap, the governing elevation is that of the lowest surface or plane.

2. Runway length. McConnell AFB has two runways built for sustained aircraft landings and takeoffs, 12,000 feet each.

3. Established Airfield Elevation. The elevation in feet above sea level for McConnell AFB is 1,371 feet.

4. Dimensions. All dimensions are measured horizontally unless other wise noted.

Planes and Surfaces. Definitions are as follows:

1. Primary Surface. This surface defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area. The primary surface comprises surfaces of the runways, runway shoulders, and laterial safety zones. The length of the primary surface is the same as the runway length of 12,000 feet. The width of the primary surface is 2,500 feet or 1,250 feet on each side of the runway centerline.

2. Clear Zone Surface. This surface defines the limits of the obstruction clearance requirements in the vicinity contiguous to the end of the primary surface. The length and width of the clear zone surface is 3,000 feet.

3. Approach-Departure Clearance Surface. This surface is symmetrical about the runway centerline extended, begins as an inclined plane (glide angle) 200 feet beyond each end of the primary surface at the centerline elevation of the runway end, and extends for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 along the runway centerline extended (glide angle) until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the start of the glide angle. The width of this surface at the runway end is 2000 feet; it flares uniformly, and the width at 50,000 is 16,000 feet.

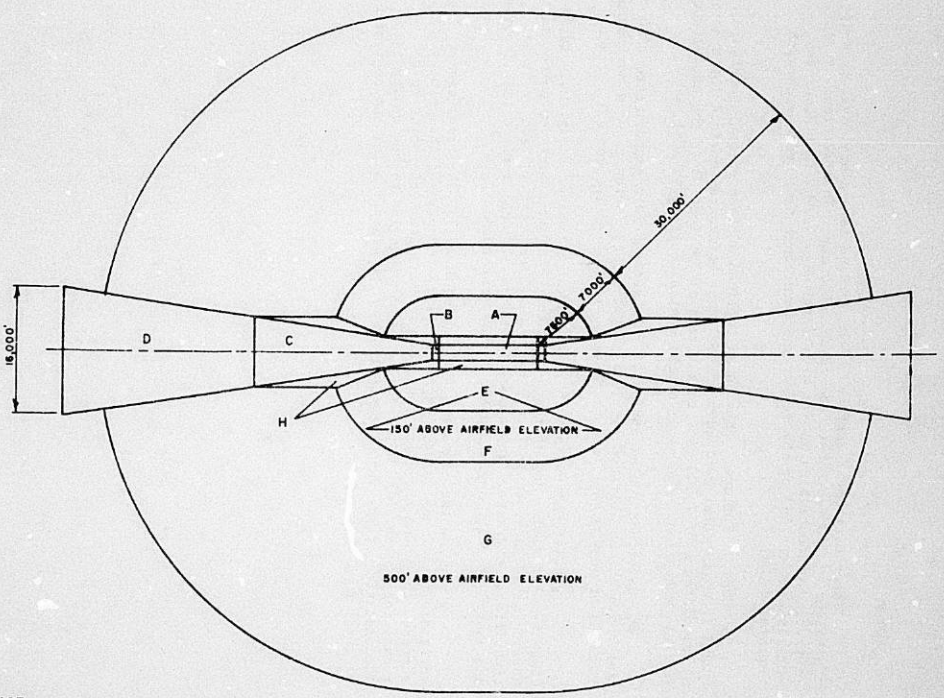
4. Inner Horizontal Surface. This surface is a plane, oval in shape at a height of 150 feet above the established airfield elevation. It is constructed by describing an arc with a radius of 7,500 feet about the centerline at the end of the runway and interconnecting these arcs with tangents.

5. Conical Surface. This is an inclined surface entending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation. The slope of the conical surface is 20:1.

6. Outer Horizontal Surface. This surface is a plane located 500 feet above the established airfield elevation. It extends for a horizontal distance of 50,000 feet from the outer periphery of the conical surface.

7. Transitional Surfaces. These surfaces connect the primary surfaces, clear zone surfaces, and approach-departure clearance surfaces to the inner horizontal surface, conical surface, outer horizontal surface or other transitional surfaces. The slope of the transitional surface is 7:1 outward and upward at right angles to the runway centerline.

To determine the elevation for the beginning of the transitional surface slope at any point along the lateral boundary of the primary surface, including the clear zone, draw a line from this point to the runway centerline. The line will be at right angles to the runway axis. The elevation at the runway centerline is the elevation for the beginning of the 7 to 1 slope.



A. PRIMARY SURFACE
B. CLEAR ZONE SURFACE
C. APPROACH / DEPARTURE CLEARANCE SURFACE (GLIDE ANGLE)
D. APPROACH / DEPARTURE CLEARANCE SURFACE (HORIZONTAL)
E. INTER HORIZONTAL SURFACE
F. CONICAL SURFACE
G. OUTER HORIZONTAL SURFACE
H. TRANSITIONAL SURFACE

AIRSPACE CONTROL SURFACE - PLAN

FIG. E-1

APPENDIX F

APPENDIX F

NOISE LEVEL REDUCTION GUIDELINES

BACKGROUND:

Environmental noise affects substantial amounts of land area within the United States. Through many years of research by a number of agencies and groups it has been determined that exterior noise may be isolated and reduced in living and working environments through design and construction techniques, noise insulation or attenuation, which selectively decrease the sound entering occupied structures from the outside. The noise reduction required is based upon calculations of noise exposure, with the index of noise exposure including the noise level, its duration, frequency of occurrence, and time of day of the occurrence (see Appendix D-description of the Noise Environment). The graduated Noise Level Reduction standards (NLR) are based upon the reduction in decibels (A-weighted) of a standard noise source from the exterior to the interior of a structure.

PURPOSE:

This appendix provides recommended standards for design and construction techniques for primarily residential construction which will achieve the NLR corresponding to the land use compatibility guidelines identified in Section IV. These standards are intended to serve as a framework to develop (amend or supplement) a building code for exterior noise isolation with respect to aircraft noise. They are not intended to repeal, abrogate, annul or in any way impair or interfere with existing provisions of other laws or ordinances, or with private restrictions placed upon property by covenant, deed, easement or other private agreement. In those instances where these standards would impose a greater restriction upon the land, buildings or structures it is recommended that they govern. Other methods exist to achieve the NLRs.

DEFINITIONS:

Words or phrases not defined in this appendix shall derive their meaning from nationally approved agencies, publications, common usage or court cases.

A-WEIGHTED SOUND LEVELS: See Sound Level

Adjusted Noise Level Reduction (ANLR): (See Noise Level Reduction) Noise level reduction outside-to-inside a designated room that has been adjusted as if the room when furnished contained an amount of sound absorption equal to the floor area of the room.[1] The adjustment is accomplished by adding to a measured sound level reduction ten times the common logarithm of the ratio of the floor area of the room to the measured sound absorption of the room. No adjustment is added if the sound level reduction measurement is made in a room that is furnished for its intended usage.

ANSI SPECIFICATIONS:

Specifications by the American National Standards Institute adopted by reference herein. Such references to decibels, frequency bands and others as referred to in such specifications are inclusive as definitions within the meaning of this appendix.

ASTM SPECIFICATIONS:

Specifications by the American Society for Testing Materials adopted by reference herein. Such references to decibels, frequency bands and others as referred to in such specifications are inclusive as definitions within the meaning of this appendix.

DECIBEL (db):

The physical unit commonly used to describe noise levels; the unit of level such as the sound pressure level. One decibel is the level of the squared sound pressure that is 10 1/10 = 1.259 times the squared reference sound pressure; also, one decibel is the level of the sound pressure that is 10 1/20 = 1.122 times the reference pressure.

ENFORCING OFFICER:

The person designated by properly constituted authority to enforce the regulation.

FREQUENCY:

Number of complete oscillation cycles per unit of time. The unit of frequency often used is the Hertz (Hz).

FREQUENCY BAND:

Difference in Hertz between the upper lower frequencies that delimit a band, or the interval in octaves between the two frequencies. The band is located frequency-wise by the geometric mean frequency between the two band-edge frequencies. Examples are: "an octave band centered at 500 Hz", or more simply, "the 500 Hz octave band."

HERTZ:

Unit of frequency equal to one cycle per second.

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1 In many living rooms the sound absorption therein is equal to the floor area, or 10 to 20 percent more, so the adjusted noise level reduction measured in an unfurnished room is expected to be nearly equal to the sound level reduction that will exist when the room is normally furnished.

DNL (DAY-NIGHT AVERAGE SOUND LEVEL):

The A-weighted average sound level in decibels (re: 20 micropascals during a 24-hour period (or specified multiple thereof, such as a year) with a 10-decibel weighting applied to night time sound levels (2200-0700).

NOISE LEVEL:

Same as sound level, for airborne sound, unless specified otherwise.

NOISE LEVEL REDUCTION (NLR):

Difference in decibels, between the noise level outside a building and the noise level inside a designated room in the building that was caused by exterior noise.

NOISE REDUCTION (NR):

Reduction in decibels, of the sound pressure levels between two designated locations or rooms, for a stated frequency or frequency band.

NOISE ZONE:

Any area of land or water which is between two noise contour lines as designated by the DNL noise descriptor system.

OCCUPIED ROOMS:

Rooms within enclosed structures which are, or may reasonably be expected to be used for human activities which involve speech communication, sleeping, eating, listening to live, recorded or broadcast music or speech, or regular usage of telephones.

PERSON:

Individual, firm, partnership, corporation, company, association, joint stock association, or body politic, includes the trustee, receiver, assignee, administrator, executor, guardian, or other representatives.

QUALIFIED ACOUSTICAL CONSULTANT:

A person who, by reason of his training and experience in the science and technology of acoustics and his knowledge of construction methods and materials, is considered qualified to pass judgement on acoustical design, materials, and methods of construction for the attenuation of noise, and who is acceptable to the Enforcing Officer.

REVERBERATION TIME:

Time that would be required for sound pressure level in a room to decay 60 decibels, after a sound source in the room is stopped.

SOUND ABSORPTION:

Capacity of materials and furnishings in a room to absorb sound. For the purposes of this appendix, the sound absorption is equal to 0.05 times the room volume in cubic feet divided by the measured reverberation time in seconds determined with an octave band of noise centered at 500 Hertz.[1]

SOUND LEVEL:

In decibels, the quantity measured by an instrument satisfying requirements of American National Standard Specification for Sound Level Meters S1.4.-1971, or the latest revision thereof. Unless explicitly described otherwise, the sound level shall be the frequency-weighted sound pressure level obtained with the frequency weighting A and the standardized dynamic characteristic SLOW.[2]

SOUND PRESSURE LEVEL:

In decibels, 20 times the logarithm to base ten of the ratio of a sound pressure to the reference sound pressure. The reference pressure for airborne sound is 20 micronewtons per square meter (0.0002 microbar).

SOUND TRANSMISSION CLASS (STC):

A single-figure rating of the sound insulating properties of a partition as determined by methods described in "Determination of Sound Transmission Class", American Society of Testing and Materials Designation E413-73.

SOUND TRANSMISSION LOSS:

The noise reduction between two rooms, in a specified frequency band, plus ten times the common logarithm of the ratio of the area of the partition to the total sound absorption in the receiving room, as determined by methods described in "Measurement of Airborne Sound Insulation in Building", American Society of Testing and Materials Designation #90-70 or latest revision thereof.[1]

DELINEATION OF DISTRICTS

It is recommended that the Compatible Use Districts defined and delineated in Chapter IV be utilized for determining the required NLR.

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[1]In many normally furnished rooms, the sound absorption is roughly equal, numerically, to the floor area of the room. Sound absorption measured in a room, either empty or furnished, can be obtained from measurements of the reverberation time and the volume of the room.

[2]In this appendix, the sound level is to be understood to be the A-weighted sound level (meter response-slow). With the A-weighting, the sound-level meter is relatively less sensitive to low-frequency sound, somewhat in the air is progressively less sensitive to sounds of frequency below 1000 Hertz (cycles per second).

ADOPTED SPECIFICATIONS

It is recommended that the following specifications be adopted and made a part of any ordinance: Sound level measuring instrument: ANSI S1.4-1971; Sound transmission loss: ASTM E90-66T or ASTM E90-70; Air Filtration test: ASTM E283-65T or latest revision thereof.

NLR DESIGN REQUIREMENTS

General Requirements.

a. The recommended NLR requirements for Chapter IV - Compatible Use Districts (CUD) may be achieved by any suitable combination of building design, choice of building materials and execution of construction details in accordance with established architectural and acoustical principles. The NLR requirements should apply to all occupied rooms having one or more exterior walls or ceilings, when furnished in accordance with the intended final usage of the rooms.

b. Compliance with the recommended design and construction standards of this appendix satisfies the NLR requirements recommended in the CUD's of Chapter IV. The standards should be applied to plans and specifications for any proposed structure of use for which an NLR 25, NLR 30, or NLR 35 is recommended. If the plans or specifications do not indicate compliance with the recommended standards of this appendix, a written statement from a qualified accoustical consultant should accompany the plans and specifications certifying that the construction of the building will result in a NLR for appropriate occupied rooms at least as great as the NLR value specified for the applicable CUD. Additions, alterations, repairs and changes of use or occupancy in existing buildings should comply with the provisions of this appendix except as recommended in the Uniform Building Code.

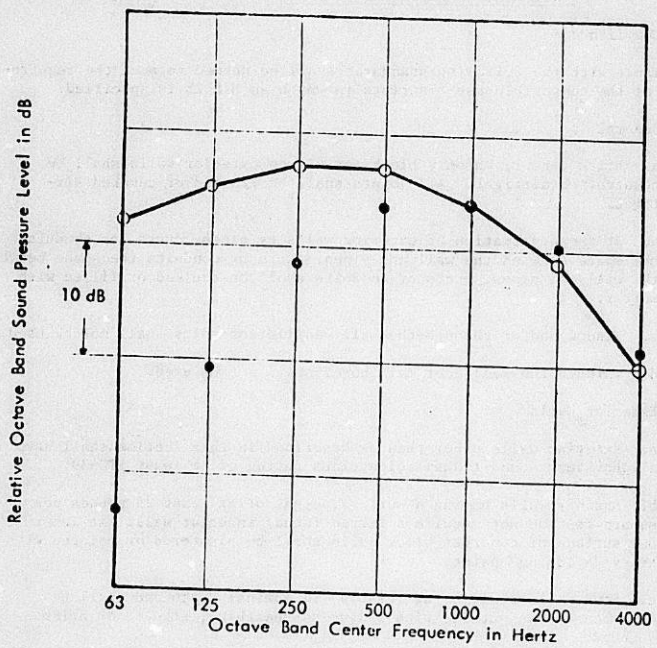
NLR DESIGN INFORMATION

For calculations undertaken for purposes of meeting the recommendations of this appendix, a Qualified Acoustical Consultant may use the assumed outside noise spectrum shown in figure F-1. Such calculations should take into account the area of exposed room surfaces, the sound transmission loss characteristics of exposed room surfaces and the amount of sound absorption in the room. For rooms in residential structures the ratio of the sound absorption in each room to the room floor area may be assumed to be:

OCTAVE CENTER FREQUENCY BAND, H_3	SOUND ABSORPTION FLOOR AREA
63	0.30
125	0.50
250	0.75
500 and higher	1.0

Allowances should be made for a decrement of at least two decibels for sound leaks and flanking sound transmission paths.

[1] A measure of the sound insulating properties of a wall/floor/ceiling/window/door, that are characteristics of the partition itself and not the room of which it is a part.



Note: Closed Circles show the corresponding relative A-Weighted octave band sound pressure levels.

FIGURE F - 1 OCTAVE BAND NOISE SPECTRUM TO BE USED FOR CALCULATION OF NOISE LEVEL REDUCTION

RECOMMENDED BUILDING REQUIREMENTS:

A. SECTION 1 - RECOMMENDED BUILDING REQUIREMENTS FOR A MINIMUM NOISE LEVEL REDUCTION OF 25 db

1-1 Compliance

Compliance with the following standards shall be deemed to meet the requirements of the compatible use districts in which an NLR 25 is specified.

1-2 General

a. Brick veneer, masonry blocks or stucco exterior walls shall be constructed airtight. All joints shall be grouted or caulked airtight.

b. At the penetration of exterior walls by pipes, ducts, or conduits the space between the wall and pipes, ducts or conduits the space between the wall and pipes, ducts or conduits shall be caulked or filled with mortar.

c. Window and/or through-the-wall ventilation units shall not be used.

d. Through-the-wall/door mail boxes shall not be used.

1-3 Exterior Walls

a. Exterior walls other than as described in this section shall have a laboratory sound transmission class rating of at least STC-39.

b. Masonry walls having a surface weight of at least 25 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered or painted with heavy "bridging" paint.

c. Stud walls shall be at least 4" in nominal depth and shall be finished on the outside with siding-on-sheathing, stucco, or brick veneer.

(1) Interior surface of the exterior walls shall be of gypsum board or plaster at least 1/2" thick, installed on the studs.

(2) Continuous composition board, plywood or gypsum board sheathing at least 1/2" thick shall cover the exterior side of the wall studs behind wood, or metal siding. Asphaltic or wood shake shingles are acceptable n lieu of siding.

(3) Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.

(4) Insulation material at least 2" thick shall be installed continuously throughout the cavity space behind the exterior sheathing and between wall studs. Insulation shall be glass fiber or mineral wool.

1-4 Windows

a. Windows other than as described in this section shall have a laboratory sound transmission class rating of at least STC-28.

b. Glass shall be at least 3/16" thick.

c. All operable windows shall be weather stripped and airtight when closed so as to conform to an air infiltration test not to exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM E-283-65-T.

d. Glass of fixed-sash windows shall be sealed in an airtight manner with a non-hardening sealant, or a soft elastomer gasket or glazing tape.

e. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal Specifications: TT-S-00227, TT-S-00230, or TT-S-00153.

f. The total area of glass in both windows and doors in sleeping spaces shall not exceed 20% of the floor area.

1-5 Doors

a. Doors, other than as described in this section shall have a laboratory sound transmission class rating of at least STC-28.

b. All exterior side-hinged doors shall be solid-core wood or insulated hollow metal at least 1-3/4" thick and shall be fully weather stripped.

c. Exterior sliding doors shall be weather stripped with an efficient airtight gasket system with performance as specified in Section 1-4C. The glass in the sliding doors shall be at least 3/16" thick.

d. Glass in doors shall be sealed in an airtight non-hardening sealant, or in a soft elastomer gasket or glazing tape.

e. The perimeter of door frames shall be sealed airtight to the exterior wall construction as described in Section 1-4E.

1-6 Roofs

a. Combined roof and ceiling construction other than described in this section and Section 1-7 shall have a laboratory sound transmission class rating of at least STC-39.

b. With an attic or rafter space at least 6" deep, and with a ceiling below, the roof shall consist of closely butten 1/2" composition board, plywood or gypsum board sheathing topped by roofing as required.

c. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6", the roof construction shall have a surface weight of at least 25 pounds per square foot. Rafters, joists or other framing may not be included in the surface weight calculation.

d. Window or dome skylights shall have a laboratory sound transmission class rating of at least STC-28.

1-7 Ceilings

a. Gypsum board or plaster ceilings at least 1/2" thick shall be provided where required by Paragraph 1-6B above. Ceiling shall be substantially airtight, with a minimum number of penetrations.

b. Glass fiber or mineral wool insulation at least 2" thick shall be provided above the ceiling between joists.

1-8 Floors

a. Openings to any crawl spaces below the floor of the lowest occupied rooms shall not exceed 2% of the floor area of the occupied rooms.

1-9 Ventilation

a. A mechanical ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without the need to open any windows, doors, or other openings to the exterior.

b. Gravity vent openings in attics shall not exceed code minimum in number and size.

c. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with 1" thick coated glass fiber, and shall be at least 5 ft. long with one 90 degree bend.

d. All vent ducts connecting the interior space to the outdoors, excepting domestic range exhaust ducts, shall contain at least a 5 ft. length of internal sound absorbing duct lining. Each duct shall be provided with a bend in the duct such that there is no direct line of sight through the duct from the venting cross section to the room-opening cross section.

e. Duct lining shall be coated glass fiber duct liner at least 1" thick.

f. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a baffle plate across the exterior termination which allows proper ventilation. The dimensions of the baffle plate should extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be of the same material and thickness as the vent duct material.

g. Fireplaces shall be provided with well-fitted dampers.

RECOMMENDED BUILDING REQUIREMENTS:

B. SECTION 2 - RECOMMENDED BUILDING REQUIREMENTS FOR A MINIMUM NOISE LEVEL REDUCTION OF 30 db

2-1 Compliance

Compliance with the following standards shall be deemed to meet the requirements of the Compatible Use Districts in which an NLR 30 is specified.

2-2 General

a. Brick veneer, masonry blocks or stucco exterior walls shall be constructed airtight. All joints shall be grouted or caulked airtight.

b. At the penetration of exterior walls by pipes, ducts or conduits, the space between the wall and pipes, ducts or conduits shall be caulked or filled with mortar.

c. Window and/or through-the-wall ventilation units shall not be used.

d. Operational vented fireplaces shall not be used.

e. All sleeping spaces shall be provided with either a sound-absorbing ceiling or a carpeted floor.

f. Through-the-wall/door mailboxes shall not be used.

2-3 Exterior Walls

a. Exterior walls other than as described below shall have a laboratory sound transmission class rating of at least STC-44.

b. Masonry walls having a surface weight of at least 40 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered or painted with heavy "bridging" paint.

c. Stud walls shall be at least 4" in nominal depth and shall be finished on the outside with siding-on-sheathing, stucco, or brick veneer.

(1) Interior surface of the exterior walls shall be of gypsum board or plaster at least 1/2" thick, installed on the studs. The gypsum board or plaster may be fastened rigidly to the studs if the exterior is brick veneer or stucco. If the exterior is siding-on-sheathing, the interior gypsum board or plaster must be fastened resiliently to the studs.

(2) Continuous composition board, plywood or gypsum board sheathing shall cover the exterior side of the wall studs behind wood, or metal siding. The sheathing and facing shall weight at least 4 pounds per square foot.

(3) Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.

(4) Insulation material at least 2" thick shall be installed continuously throughout the cavity space behind the exterior sheathing and between wall studs. Insulation shall be glass fiber or mineral wool.

2-4 Windows

a. Windows other than as described in this section shall have a laboratory sound transmission class rating of at least STC-33.

b. Glass of double-glazed windows shall be at least 1/8" thick. Panes of glass shall be separated by a minimum 3" air space.

c. Double-glazed windows shall employ fixed sash or efficiently weather stripped operable sash. The sash shall be rigid and weather stripped with material that is compressed airtight when the window is closed so as to conform to an infiltration test not to exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM E-283-65-T.

d. Glass of fixed-sash windows shall be sealed in an airtight manner with a non-hardening sealant, or soft elastomer gasket or glazing tape.

e. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal Specifications: TT-S-00227, TT-S-00230, or TT-S-00153.

f. The total area of glass of both windows and exterior doors in sleeping spaces shall not exceed 20% of the floor area.

2-5 Doors

a. Doors, other than as described in this section shall have a laboratory sound transmission class rating of at least STC-33.

b. Double door construction is required for all door openings to the exterior. Openings fitted with sidehinged doors shall have one solid-core wood or insulated hollow metal core door at least 1-3/4" thick separated by an airspace of at least 4" from another door, which can be a storm door. Both doors shall be tightly fitted and weather stripped.

c. The glass of double-glazed sliding doors shall be separated by a minimum 4" airspace. Each sliding frame shall be provided with an efficiently airtight weather stripping material as specified in Section 2-4C.

d. Glass of all doors shall be at least 3/16" thick. Glass of double sliding doors shall not be equal in thickness.

e. The perimeter of door frames shall be sealed airtight to the exterior wall construction as indicated in Section 8-4.E.

f. Glass of doors shall be set and sealed in an airtight non-hardening sealant, or a soft elastomer gasket or glazing tape.

2-6 Roofs

a. Combined roof and ceiling construction other than described in this section and Section 2-7 shall have a laboratory sound transmission class rating of at least STC-44.

b. With an attic or rafter space at least 6" deep, and with a ceiling below, the roof shall consist of clesely butted 1/2" composition board, plywood or gypsum board sheathing topped by roofing as required.

c. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6", the roof construction shall have a surface weight of at least 40 pounds per square foot. Rafters, joists or other framing may not be included in the surface weight calculation.

d. Window or dome skylight shall have a laboratory sound transmission class rating of at least STC-33.

2-7 Ceilings

a. Gypsum board or plaster ceilings at least 1/2" thick shall be provided where required by Paragraph 2-6.B above. Ceilings shall be substantially airtight, with a minimum number of penetrations.

b. Glass fiber or mineral wool insulation at least 2" thick shall be provided above the ceiling between joists.

2-8 Floors

The floor of the lowest occupied rooms shall be slab on fill, below grade, or over a fully enclosed basement. All door and window openings in the fully enclosed basement shall be tightly fitted.

2-9 Ventilation

a. A mechanical ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without the need to open any windows, doors, or other openings to the exterior.

b. Gravity vent openings in attics shall not exceed code minimum in number and size. The openings shall be fitted with transfer ducts at least 3 ft. in lenght containing internal sound absorbing duct lining. Each duct shall have a lined 90 degree bend in the duct such that there is no direct line of sight from the exterior through the duct into the attic.

c. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with 1" thick coated glass fiber, and shall be at least 5 ft. long with one 90 degree bend.

d. All vent ducts connecting the interior space to the outdoors, excepting domestic range exhaust ducts, shall contain at least a 10 ft. length of internal sound absorbing duct lining. Each duct shall be provided with a lined 90 degree bend in the duct such that there is no direct line of sight through the duct from the venting cross section to the room opening cross section.

e. Duct lining shall be coated glass fiber duct liner at least 1" thick.

f. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a baffle plate across the exterior termination which allows proper ventilation. The dimensions of the baffle plate should extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be of the same material and thickness as the vent duct material.

g. Building heating units with flues or combustion air vents shall be located in a closet or room closed off from the occupied space by doors.

h. Doors between occupied space and mechanical equipment areas shall be solid core wood or 20 gauge steel hollow metal at least 1-3/4" thick and shall be fully weather stripped.

RECOMMENDED BUILDING REQUIREMENTS:

C. SECTION 3 - RECOMMENDED BUILDING REQUIREMENTS FOR A MINIMUM NOISE LEVEL REDUCTION OF 35 db

3-1 General

a. Brick veneer, masonry blocks or stucco exterior walls shall be constructed airtight. All joints shall be grouted caulked airtight.

b. At the penetration of exterior walls by pipes, ducts or conduits the space between the wall and pipes, ducts or conduits shall be caulked or filled with mortar.

c. Window and/or through-the-wall ventilation units shall not be used.

d. Operational vented fireplaces shall not be used.

e. All sleeping spaces shall be provided with either a sound absorbing ceiling or a carpeted floor.

f. Through-the-wall/door mailboxes shall not be used.

g. No glass or plastic skylight shall be used.

3-3 Exterior Walls

a. Exterior walls other than as described below shall have a laboratory sound transmission class rating of at least STC-49.

b. Masonry walls having a surface weight of at least 75 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered or painted with heavy "bridging" paint.

c. Stud walls shall be at least 4" in nominal depth and shall be finished on the outside with siding-on-sheathing, stucco, or brick veneer.

(1) Interior surface of the exterior walls shall be of gypsum board or plaster at least 1/2" thick, installed on studs. The gypsum board or plaster may be fastened rigidly to the studs if the exterior is brick veneer. If the exterior is stucco or siding-on-sheathing, the interior gypsum board or plaster must be fastened resiliently to the studs.

(2) Continuous composition board, plywood or gypsum board sheathing shall cover the exterior side of the wall studs behind wood, or metal siding. The sheathing and facing shall weigh at least 4 pounds per square foot.

(3) Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.

(4) Insulation material at least 3-1/2" thick shall be installed continuously through the cavity space behind the exterior sheathing and between wall studs. Insulation shall be glass fiber or mineral wool.

3-4 Windows

a. Windows other than as described in this section shall have a laboratory sound transmission class rating of at least STC-38.

b. Double-glazed windows shall employ fixed sash. Glass of double-glazed windows shall be at least 1/8" thick. Panes of glass shall be separated by a minimum 3" air space and shall not be equal in thickness.

c. Glass of windows shall be sealed in an airtight manner with a non-hardening sealant, or a soft elastomer gasket or glazing tape.

d. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal Specifications: TT-S-00227, TT-S-00230, or TT-S-00153.

e. The total area of glass of both windows and exterior doors in sleeping spaces shall not exceed 20% of the floor area.

3-5 Doors

a. Doors, other than as described in this section shall have a laboratory sound transmission class rating of at least STC-38.

b. Double door construction is required for all door openings to the exterior. The door shall be side-hinged and shall be solid-core wood or insulated hollow metal, at least 1-3/4" thick, separated by a vestibule at least 3 ft. in length. Both doors shall be tightly fitted and weather stripped.

c. The perimeter of door frames shall be sealed airtight to the exterior wall construction as specified in Section III-4.d.

3-6 Roofs

a. Combined roof and ceiling construction other than described in this section and Section 3-7 shall have a laboratory sound transmission class rating of at least STC-49.

b. With an attic or rafter space at least 6" deep, and with a ceiling below, the roof shall consist of closely butted 1/2" composition board, plywood or gypsum board sheathing topped by roofing as required.

c. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6", the roof construction shall have a surface weight of at least 75 pounds per square foot. Rafters, joists or other framing may not be included in the surface weight calculation.

3-7 Ceilings

a. Gypsum board or plaster ceilings at least 1/2" thick shall be provided where required by Paragraph 3-6. Ceilings shall be substantially airtight, with a minimum number of penetrations. The ceiling panels shall be mounted on resilient clips or channels. A non-hardening sealant shall be used to seal gaps between the ceiling and walls around the ceiling perimeter.

b. Glass fiber or mineral wool insulation at least 3 1/2" thick shall be provided above the ceiling between joists.

3-8 Floors

The floors of the lowest occupied rooms shall be slab on fill or below grade.

3-9 Ventilation

a. A mechanical ventilation system shall be installed that will provide the minimum air curculation and fresh air supply requirements for various uses in occupied rooms without need to open any windows, doors, or other openings to the exterior.

b. Gravity vent openings in attic shall not exceed code minimum in number and size. The openings shall be fitted with transfer ducts at least 6 ft. in length containing internal sound absorbing duct lining. Each duct shall have a lined 90 degree bend in the duct such that there is no direct line of sight from the exterior through the duct into the attic.

c. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with 1" thick coated glass fiber, and shall be at least 10 ft. long with one 90 degree bend.

d. All vent ducts connecting the interior space to the outdoors excepting domestic range exhaust ducts, shall contain at least a 10 ft. length of internal sound absorbing duct lining. Each duct shall be provided with a lined 90 degree bend in the duct such that there is no direct line of sight through the duct from the venting cross section to the room-opening cross section.

e. Duct lining shall be coated glass fiber duct liner at least 1" thick.

f. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a baffle plate across the exterior termination which allows proper ventilation. The dimensions of the baffle plate should extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be of the same material and thickness as the vent duct material.

g. Building heating units with flues or combustion air vents shall be located in a closet or room closed off from the occupied space by doors.

h. Doors between occupied space and mechanical equipment areas shall be solid core wood or 20 gauge steel hollow metal at least 1-3/4" thick and shall be fully weather stripped.

RECOMMENDED ADMINISTRATION AND ENFORCEMENT

General

It is recommended that an Enforcing Officer administer and enforce these recommendations if adopted as an ordinance. Application for permits and variances should be made to the Enforcing Officer.

Verification of Building Noise Level Reduction

It is recommended that the Enforcing Officer, prior to granting final approval of the finished building construction, require at the expense of the owner, field tests by a Qualified Acoustical Consultant to verify the noise level reduction (NLR) of the building whenever it appears that variations from sound-isolation features in the approved plan, poor sealing methods, or defective workmanship may have been employed. The report of verification should be filed with the Enforcing Officer and include a description of the verification method, measurement instrumentation and the results of the noise level reduction-measurements.

The noise level reduction requirements of Chapter IV should be satisfied for each occupied room. For the purposes of verification, it would suffice to test only in those occupied rooms in which exterior noise is most likely to penetrate.

Verification Test Procedure

For the purpose of verifying compliance with the noise level reduction requirements in a completed building, aircraft noise prevailing outside the building may be used as the sound source.

Using the noise signal generated by an individual aircraft operation (flyover event), outside and inside noise levels should be measured simultaneously. The difference between the maximum noise levels measured outside and inside the room for the flyover event should be taken as the measured NLR for the flyover event, provided that the maximum inside noise level exceeds by at least seven decibels the background noise level in the absence of the flyover.

The NLR shall be determined for at least four flyover events for each room tested. The resulting NLR value assigned to the room should be the arithmetic average of the individual flyover event NLR values.

For occupied rooms in residential structures, the inside noise level should be measured with a single microphone four feet above the floor near the center of the room. For other than residential structures, the inside noise level should be measured with a single microphone five feet above the floor, either near the center of the room, or eight feet into the room from the center of the exterior wall most directly exposed to the aircraft noise, whichever distance from the most directly exposed wall is smaller.

The outside noise level should be measured at an unobstructed location approximately five feet above the level of the floor of the room under the test and eight feet outside the exterior wall most directly exposed to the aircraft noise source, near the center of the wall.

For structures in which several rooms are to be evaluated, the tests need be conducted only for those rooms whose exterior walls are most directly exposed to the noise source. If noise level reduction requirements are met for these rooms, the tests need not be repeated for rooms of similiar construction which are not as directly exposed to the flyover event.

For structures where a number of rooms receive nearly equal exposure to aircraft noise, tests need be conducted in only two of the near-identical rooms.

For residential units, it will usually be sufficient to conduct tests in two rooms. One of the rooms to be tested should be the bedroom most directly exposed to aircraft noise. The other room to be tested should be either the living room, dining room or family room, whichever is most directly exposed to the aircraft noise source.

When the noise level reduction is measured in an unfurnished room or a room furnished less than normally, the adjusted noise level reduction should be computed by adding ten times the logarithm to the base ten of the ratio of the floor area of the room to the sound absorption in the unfurnished room, but in any event, such correction should not exceed two decibels. The adjusted noise level reduction value should be used in determining compliance with the NLR requirements. If the noise level reduction is measured in a furnished room, no adjustment in the noise level reduction shall be made.

The noise levels measured outside and inside the room under test may be observed directly by simultaneously reading the maximum noise levels on two sound level meters. Alternatively, the outside and inside flyover event noise signals shall be recorded on magnetic tape with noise level reduction determined by analysis of the recorded signals. In either case, the two measuring systems used for outside and inside noise measurements must each satisfy the requirements for a Type 2 sound level meter according to ANSI S1.4-1971 and be operated in the manner designated by ANSI S1.13-1971 (or latest revisions thereof). Further, the two systems are to be calibrated prior to and following the flyover events so that they indicate the same sound level, within one decibel, for the same noise, using suitable calibration procedures as specified by the sound level meter manufacturer.

APPENDIX G

APPENDIX G

OPERATIONAL CHANGE EVALUATION

Patterns as flown today have evolved throughout the history of McConnell Air Force Base as being the best possible in consonance with Air Force directives, safety, noise abatement and pollution.

The following actions have been taken to abate the noise problem in Wichita and Derby caused by McConnell assigned aircraft:

Aircraft will not fly over Derby in Visual Flight Rule (VFR) conditions. Air Traffic Control (ATC) will avoid vectoring aircraft over Derby unless it is required to achieve traffic separation of safety. Flying over Wichita is prohibited except where absolutely necessary for making an instrument approach to 18L or 18R. VFR approaches are flown as close to McConnell as possible to the north.

All aircraft departing McConnell are given vectors to 010 degrees. This heading avoids the most populated area of eastern Wichita as much as possible without interfering with the Beech Aircraft Company airfield traffic pattern. A further right turn is not possible due to location of Beech airport.

All non-precision approaches to runways 18L or 18R have been redesigned to keep aircraft as high as practical over populated areas. Crews have also been instructed to request altitude advisories for the final approach segment of all approach surveillance radar (ASR) approaches in order to hold power changes to a minimum.

Max mode on the FD 109 flight director system is used for all KC-135 takeoffs to the north. This results in the maximum angle of climb after takeoff to 2,000 feet above ground level (AGL).

All traffic patterns at McConnell are flown to the east to minimize traffic over Wichita. Traffic pattern altitudes have not been changed as a result of AICUZ since McConnell has a very congested traffic situation with many different types of military and civilian aircraft interspersed at different altitudes. This arrangement was arrived at after long deliberation, and works well from a safety standpoint. Raising the altitude of any one type of aircraft would cause a corresponding change in all others and would not be feasible, as it would result in F-4D aircraft entering Instrument Flight Rule (IFR) traffic patterns at unrealistically high altitudes, which would also unduly expand the traffic pattern or require overly steep and unsafe approaches.

A steeper precision approach (PAR) glide slope has been considered and rejected. The present 2.5 degree glide slope is optimum. A steeper glide slope of 3.0 degrees would increase crew workload on final, during transition for touchdown, and could impose safety problems for crews. The resulting noise abatement would also be minimal since an altitude difference of only 274 feet would result at the point of maximum variance between a 2.5 and 3.0 degree glide slope. KC-135 VFR traffic patterns are flown as close in as possible, already resulting in as steep a final approach as is reasonably practical.

Multiple approaches after 11:00 p.m. have been severely restricted. All pilot proficiency missions are terminated by 11:00 p.m. and no takeoffs are scheduled before 6:00 a.m. except for those directed by higher headquarters.

McConnell AFB has been designated as "Official Business Only" and transient aircraft may not file for refueling stops or as a stop over base on training flights, thus reducing flying activity.

Effective with the 4 November 1976 edition of the IFR Supplement, all transient aircraft arriving at McConnell AFB are required to make an instrument approach for landing. This is for safety in a very congested flying area and to insure noise abatement altitudes and traffic patterns are maintained.