City of Derby Sedgwick County City of Wichita

Joint Land Use Study

McConnell Air Force Base

May 2005

Joint Land Use Study

McConnell Air Force Base
Wichita, Kansas

May 13, 2005

Prepared for the
City of Derby ● City of Wichita ● Sedgwick County

Under the auspices of
the Joint Land Use Study
Policy and Technical Committees

With oversight by the
Wichita-Sedgwick County
Metropolitan Area Planning Department

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EXECUTIVE SUMMARY

INTRODUCTION

During the past several decades the U.S. Department of Defense (DoD) has become increasingly concerned about the impacts of conflicting land development patterns, often referred to as encroachment, adjacent to military installations. In 1985 the DoD instituted a cooperative process referred to as a Joint Land Use Study (JLUS) program to evaluate land use and development trends on property adjacent to active military facilities. A JLUS is normally initiated at military bases with aviation facilities after the completion of an Air Installation Compatible Use Zone (AICUZ) study that examines noise and other impacts associated with aviation activities. The JLUS is then used to identify actions that could be taken by the community and military installation to solve existing problems and prevent future ones.

In September 2004 the County of Sedgwick, Kansas received financial support from the Office of Economic Adjustment (a DoD agency) to initiate a Joint Land Use Study relating to McConnell Air Force Base. Located in Sedgwick County in south-central Kansas, McConnell AFB is part of the greater Wichita metropolitan area which is home to a number of aircraft manufacturing plants and other aircraft related industries. The team of RKG Associates, Inc. and Ricondo & Associates, Inc. was retained to assist the inter-jurisdictional partnership of the City of Derby, the City of Wichita, Sedgwick County, and McConnell AFB, under the coordinating efforts of the Wichita-Sedgwick County Metropolitan Area Planning Department (MAPD), in preparing this JLUS.

1. PROJECT PURPOSE AND STUDY AREA

There were two principle factors that resulted in the determination to conduct a JLUS analysis. One factor involves the continuing pressure of urban development around McConnell AFB from all sides. The City of Wichita, with an approximate population of 344,000, abuts the Base along its northern and western perimeters. To the east and south of McConnell AFB rural unincorporated areas of Sedgwick County have developed over the last 30 years with hundreds of rural residential estate lots. Adjoining this area to the south is the City of Derby, a smaller city of approximately 18,000 residents, that has been experiencing rapid growth which is also influencing development patterns around McConnell.

The second factor that triggered the undertaking of this JLUS was the recent change in mission for McConnell AFB. In 2002, McConnell's mission changed from operating B-1, C-12, and F-16 aircraft to operating KC-135 aircraft. Due to this change the size of the area

around the Base affected by aircraft noise was reduced considerably which resulted in the need to complete another Air Installation Compatible Use Zone (AICUZ) study. The U.S. Air Force (USAF) conducts AICUZ studies to encourage a cooperative planning effort between the Air Force and communities surrounding military installations to promote compatible land uses around its military bases. The primary goals of the AICUZ are to maintain the integrity of the intallation's mission, while minimizing negative impacts to the neighboring properties related to noise exposure and accident potential. One product of an AICUZ study is the creation of noise exposure maps which present a graphic representation of the annualized aircraft noise impact that would be typical for the Air Force Base and its environs.

In addition to identifying potential noise exposure, the AICUZ study also delineates zones at the end of a runway that correlate to the Air Force's statistics on accident potential during take-offs and landings. There are three different zones used to identify the risk potential in these areas. One is the Clear Zone (CZ), which is closest to the runway ends and which has the highest potential for accidents. Adjoining the CZ are two Accident Potential Zones (APZ), APZ-I and APZ-II, where the potential for accidents diminishes as the distance from the end of the runway increases.

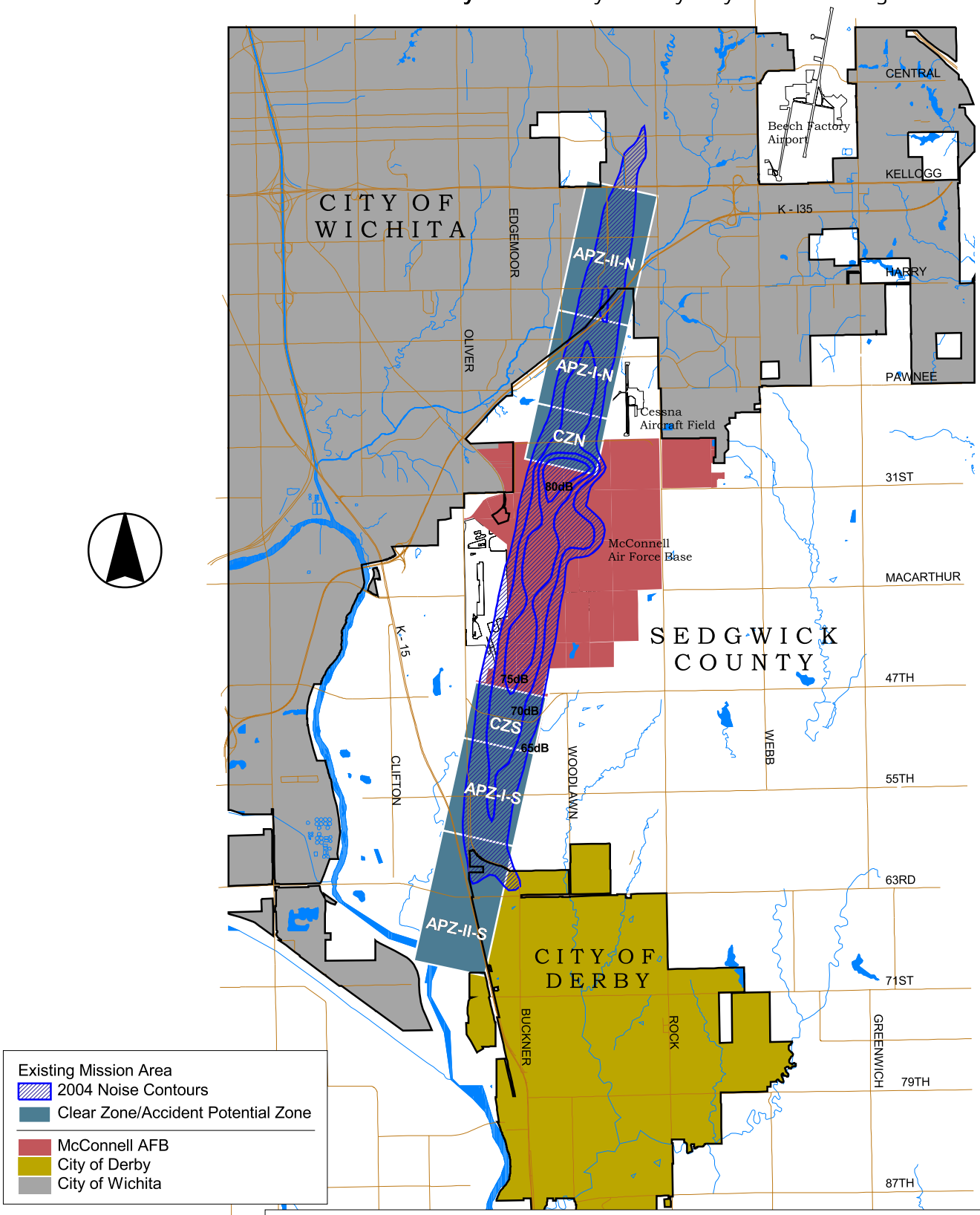
An AICUZ study was completed for McConnell AFB in 1994 and updated in 2004, due to the 2002 mission change. The 1994 noise contour area encompassed a significantly larger area than the 2004 contours resulting in a reduction in total acreage impacted by higher noise levels from approximately 17,000 to 2,500 acres. The CZ/APZ areas have a combined total of approximately 2,600 acres which did not change based on the most recent AICUZ study and corresponding change in mission status. These three AICUZ areas, along with a project-defined Joint Land Use Study (JLUS) area, formed the basis for the four study areas for which data analysis was conducted for this study. The JLUS area contains approximately 22,000 acres and represents the adjoining area of influence around McConnell AFB.

Aircraft operations related to the previous mission are referred to as the *maximum mission capability* for McConnell since it most likely represent the highest level of activity, as well as the largest noise impact area, reasonably expected to occur at the facility. The current operations associated with KC-135 aircraft is referred to as the *existing mission.* The size and location of the existing mission and maximum mission capability areas are illustrated in Figures ES-1 and ES-2, respectively. A primary requirement of this JLUS analysis, and one which added to the complexity of this project, was the preparation of a land use strategy for minimizing potential future conflicts with McConnell's maximum mission capability, even though there is presently no need for regulating the larger noise impact area given existing mission activities. Although it is possible there may be a return to the maximum mission, as well as other missions that may vary from the existing mission, there is no certainty as to if or when such a change might occur. Therefore, it will be necessary to consider alternative land use strategies that allow for flexibility in land development and management activities around McConnell if it is determined that preservation of the installation's maximum mission capability is an important goal for the community to pursue.

Existing Mission Area

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



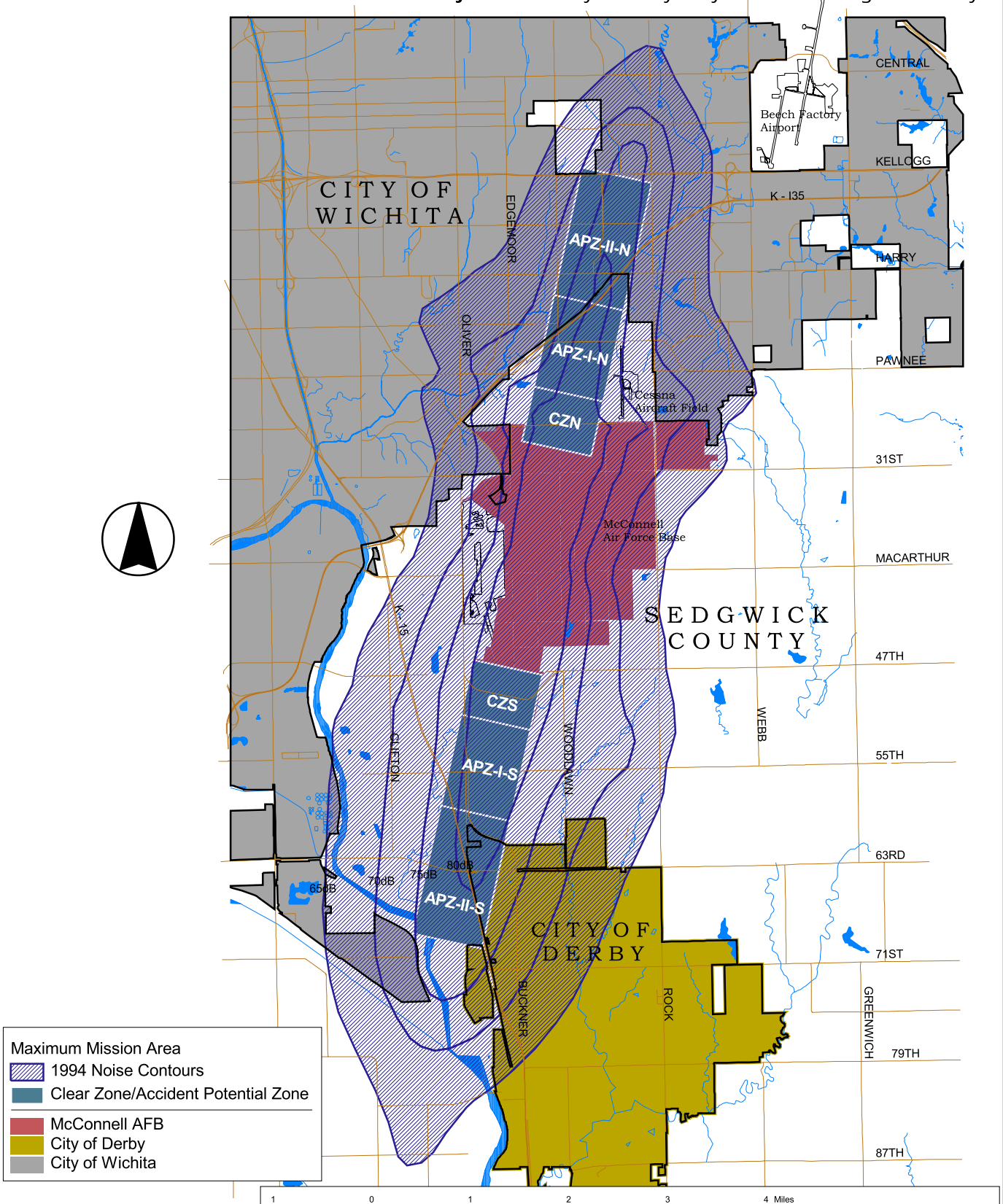
Prepared by RKG Associates, Inc. - May 2005
Source: 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure ES-1

Maximum Mission Area

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



Prepared by RKG Associates, Inc. - May 2005
Source: 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure ES-2

In light of this recent mission change several key goals were identified as being of primary importance to address as part of the JLUS process, including the following.

- Protect and promote the present and future operational/mission capacity of McConnell AFB
- Promote the long-term health, safety and welfare of the civilian and military community associated with, and in proximity to, McConnell AFB
- Evaluate the appropriateness of existing regulatory and non-regulatory measures within the study area to prevent future urban encroachment into McConnell's 1994 AICUZ area and ensure compatibility between exiting future competing land and air space uses (civilian and military)
- Develop ongoing public education/awareness initiatives to help implement JLUS recommendations

In response to the goals outlined above a scope of work was established that was designed to help the community and the military achieve the desired outcome. This Joint Land Use Study has addressed these concerns through the completion of four principle tasks listed below.

- Analysis and mapping of existing land uses as well as an assessment of land use changes since 1995 – this task also includes an evaluation of long-range planning efforts for areas adjacent to McConnell AFB
- An examination of aviation activities at McConnell AFB, as well as Colonel James Jabara Airport and nearby civilian aircraft testing facilities
- An assessment of future development potential in the study area and the identification of existing and possible future land use conflicts
- Identification of recommendations that could result in a reduction of potential land use conflicts with future operations at McConnell AFB

2. RECOMMENDATIONS AND IMPLEMENTATION STRATEGY

One of the primary goals of this JLUS analysis was to develop a *preferred land use plan* that could be used to guide future development on privately owned land within the area affected by operations at McConnell AFB. The role of the preferred land use plan was to identify land uses that are compatible with McConnell's mission while also attempting to balance the needs of the community and the rights of landowners whose property lies within the affected area. In this case, the affected areas are defined by three distinct boundaries discussed earlier in this summary including, the Clear Zones/Accident Potential Zones (CZ/APZ), the 2004 Noise Contour Area and the 1994 Noise Contour Area. Minimizing development within the CZ/APZ areas is important from a risk management and public safety standpoint because during take-offs and landings these zones are considered the most likely points of impact if in an unlikely event an accident occurred. Reducing potential conflicts within the noise contour areas is important because continuous exposure to noise can be hazardous and can lead to discontent within the adjoining community resulting in diminished support for long-term operation of the facility.

A tangent issue to potential land use conflicts is the concern related to anti-terrorism and force protection (AT/FP). Minimizing potential impacts relating to AT/FP issues are somewhat parallel to the AICUZ areas noted above, but the preferred land use plans for each are not necessarily identical or completely compatible.

The crux of developing a preferred land use plan that addresses the current mission, but which also keeps open the potential for expanded mission requirements, is the lack of, or uncertainty, about the time frame in which a change in mission status could materialize. Currently there is no definitive answer to this question. In addition, the cumulative impacts of encroachment can also be an important consideration when future mission assignments are considered. In essence there is a point at which a development threshold is crossed where the benefits of continued operation of the facility are outweighed by ever-increasing conflicts, such as with lighting, dust, radio interference and other security and safety hazards that have evolved over time.

In order to deal with these issues a two-pronged approach is recommended for establishing a preferred land use plan around McConnell that addresses both the existing mission area and the maximum mission capability area. The latter includes both a short-term and a long-term strategy.

2.1 RECOMMENDATIONS – EXISTING MISSION

The preferred land use plan for supporting the existing mission should focus on implementing a strategy designed to minimize development within the Clear Zones (CZ) and Accident Potential Zones (APZ). Addressing this issue is of primary importance for the existing mission, but it would also serve to support the maximum mission capability as well. The footprint of the 2004 AICUZ noise contours, which represents the affected area for current aircraft activities, is almost completely contained within the boundaries of the CZ and APZ areas with the exception of two small areas at the northern and southern tips of the 65 decibel (dB) contour, which are both essentially completely developed. Therefore, a strategy aimed at protecting the CZ/APZ areas would also help to minimize potential noise conflicts associated with the noise contour areas.

1. **Establish Oversight Committee to Monitor Changes Around McConnell** – The purpose of this Joint Land Use Study is to provide guidance regarding land use decisions by the local jurisdictions in the vicinity of McConnell AFB, but it is not a legal document and therefore has no force of law to ensure its recommendations are implemented. In light of this fact, it is strongly recommended that an oversight committee be established as an on-going vehicle to continue the cooperation initiated by local communities and the military as part of this JLUS process. Establishment of a McConnell/JLUS Implementation Coordinating Committee (MICC) would provide a means to maintain communication between all the involved parties, monitor on-going changes regarding McConnell's mission status, and help to insure that the JLUS recommendations are implemented to the greatest extent possible. The MICC would potentially be comprised of representatives from Wichita, Derby, Sedgwick County, and McConnell, and could also include representatives from area landowners, businesses, and other local organizations that have an interest in

supporting compatible uses around the Base. It is suggested that this committee meet quarterly to review issues related to this JLUS and the on-going mission at McConnell.

2. **Revise and Continue to Implement Current Regulatory Requirements** – Continue to manage growth within the CZ/APZ areas through the current regulatory measures contained in the Airport Overlay (A-O) zoning district (in Wichita and Sedgwick County), and the B-5 district (in Derby). However, action should be taken to address the deficiencies in the A-O district specifically identified in the JLUS report and should also re-evaluate all permitted uses in this district to minimize potential safety conflicts, as recommended in the Land Use Compatibility Guidelines (LUCG). The LUCG standards are the Federal guidelines[1] commonly used when conducting Joint Land Use Studies and are the same standards used to evaluate potential conflicts in the 2004 AICUZ study. The LUCGs identify those land uses that are recommended, not recommended, or recommended under certain conditions (e.g. if noise level reduction measures are implemented), within the CZ/APZ areas as well as the noise contour areas.

3. **Institute Noise Level Reduction Measures** – Consider amending existing building codes to include Noise Level Reduction (NLR) measures as recommended in the LUCGs. The remaining undeveloped land within the 2004 Noise Contour Area that would be affected by such measures is relatively small, totaling approximately 390 acres, almost all of which lies within the unincorporated portions of the county.

4. **Negotiate Agreement with Cessna Aircraft Company** – Sedgwick County and/or the City of Wichita should initiate discussions with the Cessna Aircraft Company with the intent of restricting future development on the approximately 250 acres of undeveloped land owned by the company in the northern APZ-I area. The goal of these discussions would be to obtain a Memorandum of Understanding (MOU), or similar type of agreement, that would restrict use of this land to agricultural activities for as long as McConnell continues to operate. If such an agreement cannot be reached then other land acquisition or growth management techniques should be considered, as discussed in Recommendation 6 below, as an alternative approach to protecting this critical land area. The Air Force had previously negotiated a perpetual easement on 90 acres owned by Cessna in the northern Clear Zone.

5. **Establish Real Estate Disclosure Process** – There is currently no law or mechanism in place within the real estate transfer process that requires prospective buyers of property located in the 2004 Noise Contour Area to be notified that they are purchasing property in an area that is susceptible to noise impacts. It is recommended that such a notification process be established in a manner that most appropriately meshes with the county's existing real estate transfer process. However, any such process should involve permanent recording of a document that has been signed by the buyer indicating that such notification has been provided.

[1] *Guidelines for Considering Noise in Land-Use Planning and Control,* Federal Interagency Committee on Urban Noise, 1980, and the *Standard Land Use Coding Manual,* U.S. Department of Transportation.

6. **Initiate Land Protection/Acquisition in APZ Areas** – As noted previously, the development of land within the Accident Potential Zones is currently regulated by the A-O and B-5 zoning districts respectively, within Wichita/Sedgwick County and the City of Derby. These zoning regulations are intended to minimize land use conflicts in the APZ areas in accordance with the LUCGs. Although this is an acceptable approach for reducing potential conflicts, it does have two drawbacks. One is that despite these regulations, the long-term cumulative impacts of development in the APZ areas can still have negative affects on McConnell's continuing mission. The other is that zoning is not permanent and can be changed at some point in the future due to a variety of economic, social, and political reasons. In light of these possibilities, it is recommended that initiation of a program to acquire the remaining undeveloped land within the APZ areas be considered. Acquisition of land within these zones would also serve to eliminate potential noise conflicts associated with the 2004 AICUZ as well as support preservation of the maximum mission capability area which includes the same Accident Potential Zones.

7. **Future Land Use Plan/Rezoning Process** – The Metropolitan Area Planning Department (MAPD) is currently in the process of updating the future land use portion of the Comprehensive Plan for areas located in Sedgwick County. The City of Derby provided input for this regional plan and is also in the process of updating its own comprehensive plan. Overall, the proposed future land use plan offers a number of appropriate planning concepts with regard to minimizing potential land use conflicts with the continuing mission of McConnell AFB. There are, however, a few issues to be considered with this proposed plan. The most critical issue revolves around the fact that the future land use plan is geared toward minimizing land use conflicts associated with the 1994 AICUZ areas that include the much larger noise contour footprint. However, there is no guarantee at this time that McConnell's mission will return to the status that reflects these AICUZ boundaries. Therefore, if this future land use plan were adopted at this time it could lead to a rezoning and adoption of regulations, including noise level reduction measures in the building code, which may not be necessary. Therefore, it is recommended that the proposed future land use plan remain somewhat flexible at this time and the existing zoning remain in place for the next two to three years, or until such time as a more definitive determination is reached by the U.S Air Force and/or the Department of Defense, regarding the long-term status of possible future missions at McConnell. During this interim period the review committee outlined in Recommendation 1 above should meet at least quarterly to evaluate the status of McConnell's mission, based on the most recent information available.

8. **Address Anti-Terrorism/Force Protection (AT/FP) Concerns** – It is recommended that representatives of McConnell AFB, the City of Wichita, Sedgwick County and the City of Derby establish a process for reviewing AT/FP issues within a specific framework, as opposed to on a case-by-case basis. One approach to establishing this process could be accomplished through implementation of the Protective Overlay (P-O) district as authorized in the Wichita/Sedgwick County (W/SC) zoning code. The

P-O district (Article III, Section C, *Special Purpose and Overlay Districts* of the zoning code) can be applied in combination with any base or underlying zoning district, and allows for tailoring use or property development standards to individual projects or specific properties.

It is recommended that the aforementioned parties work together to determine the most appropriate size and location of how the P-O district should be situated around McConnell. It is assumed that the district could resemble a "buffer area" of a certain distance extending away from the Base's fence line. Representatives from McConnell should be responsible for recommending development review guidelines and standards that would be used to evaluate proposed activities within this buffer regarding potential impacts on AT/FP issues.

3. RECOMMENDATIONS – MAXIMUM MISSION CAPABILITY

The maximum mission capability for the purpose of this JLUS is defined as the noise contour boundaries established for the 1994 AICUZ study. It also includes the CZ/APZ areas that have the same boundaries for both the existing mission (2004 AICUZ) and the maximum mission.

As noted previously, the time frame in which McConnell AFB might return to maximum mission status, or any other level of operations, cannot be specifically determined at this time. However, there is a desire to preserve all realistic options for Base operations since this facility is an important component of the area's economy as well as the nation's security forces. Maintaining McConnell's maximum mission capability will require flexibility and cooperation from all parties involved in the land use planning process including the Cities of Wichita and Derby, Sedgwick County, the U.S. Air Force, and property owners in the affected area.

Due to the uncertainty associated with a return to McConnell's previous operating mission (pre-2002), the recommendations for preserving maximum mission capability have both a short-term and long-term component. These alternatives are outlined below.

3.1 Recommended Actions – Short-Term

The short-term recommendations for preserving the maximum mission capability include all eight of the recommended actions presented in the previous section of this summary, which are intended to support the existing mission. The reason for this similarity is that recommendations related to the existing mission are primarily focused on minimizing land use conflicts within the CZ/APZ areas, which are equally important for the maximum mission operations as well.

3.2 Recommended Actions – Long-Term

The following recommendations are intended to support a long-term strategy for minimizing land use conflicts that could potentially affect McConnell's maximum mission capability. These recommendations would only be implemented if it is determined, within the next two to three years, that McConnell's mission status will be expanded and that such a change would involve a return to aircraft operations that affect land within the larger

1994 AICUZ area. Therefore, implementation of the following recommendations could be delayed during this interim time period unless it was determined that more immediate implementation would not conflict with the long-term future land use needs of Sedgwick County and the Cities of Wichita and Derby.

The management of long-term future land use conflicts related to the maximum mission capability is primarily focused on the remaining undeveloped land within the 1994 Noise Contour Area. This includes about 4,900 acres of which, approximately 1,000 acres are located in the APZ areas and therefore, would be addressed as part of the recommendations intended to preserve the existing mission status. The remaining 3,900 acres land, most of it comprised of unincorporated county land, are outside the aircraft hazard areas but subject to potential noise impacts. The alternative methods presented below would serve to reduce the potential for noise impacts but also help to lessen the effects of impacts related to cumulative development around McConnell.

1. **Land Use Regulatory Actions** – Presently, there is no comprehensive noise management plan in place for land within the 1994 noise contours located in Sedgwick County or the Cities of Wichita and Derby. The proposed future land use plan developed by the MAPD offers a reasonable strategy for achieving a long-term preferred land use plan around McConnell with a few exceptions. One of these exceptions is a lack of adequate noise controls for non-residential and residential development. Another is the fact that some proposed residential areas of the future land use plan are not considered suitable for residential development where noise exposure levels are higher than 75 dB. Implementation of the proposed future land use plan should remain flexible over the next two to three years in order to evaluate the potential for mission change at McConnell. During this interim period it is recommended that the LUCG standards be applied to proposed development within the 1994 Noise Contour Area. This could be accomplished by imposing the Protective Overlay (P-O) zoning regulations in the Wichita-Sedgwick County zoning code and using the LUCGs as a basis for reviewing development proposals within this area.

2. **Purchase Noise-Sensitive Areas** – As an alternative to regulatory methods for preserving land within the maximum mission noise contours, fee-simple purchase of noise-impacted land is the most permanent form of land-use control that could be considered. This approach is usually the most expensive however, when combined with either resale for compatible uses or retention and use for a compatible purpose, the net cost may be reduced greatly. As a preventive measure, purchase should usually be limited to critical locations or in cases for which other solutions would not work. If a property acquisition program were to be established for McConnell, it should set a hierarchy of priorities for most critical areas related to Base operations as follows: APZ-I and APZ-II; 80dB and higher noise contour; 75-79dB noise contour; 70-74dB noise contour; and 65-69dB noise contour.

3. **Acquire Easements for Noise-Sensitive Areas** – As an alternative to fee-simple acquisition of land the acquisition of easements could be applied to all or portions of

the undeveloped land within the 1994 Noise Contour Area. Easements can be an effective and permanent form of land-use control. In many instances, they may be better than zoning for dealing with the installation's compatibility issues. Easements are permanent; with the title held by the purchaser until sold or released, and work equally well within different jurisdictions. They are legally enforceable and typically acquired for a portion of the cost of the fee-simple land value. Another consideration is that the land can be made available for full development with noise-compatible uses under the terms of the easement.

4. **Transfer of Development Rights (TDR)** - The TDR concept involves transferring some of the property's developmental rights to another location where they may be used to intensify allowable development. With TDR, for example, lands within an installation's noise-impacted area could be kept in open space or agricultural areas and their developmental rights for residential uses transferred to locations outside the area. Landowners could be compensated for the transferred rights by their sale at the new location or the rights could be purchased by another organization. Depending on market conditions and/or legal requirements, the community or another organization could either hold or resell the rights. The TDR approach must be fully coordinated with the community's planning and zoning activities. It will also be necessary for the zoning ordinance to be amended so that it permits TDRs.

5. **Land Banking** - The term "land banking" is defined as a system in which an entity, such as the local governing body, acquires a substantial amount of land available for future development within a given region for the purpose of implementing a public land use policy. Land banking prohibits the land being acquired from becoming committed to a specific use at the time of acquisition; in addition, the land must be large enough to have a substantial affect on urban growth patterns. Land banking differs from permanent acquisition in that it places the land in a temporary holding status to be turned over for development at a future date. Land banking could be appropriate in the case of McConnell for purchasing undeveloped land within the 1994 noise contours until there is more certainty regarding the maximum mission status of the facility.

6. **Public/Private Leaseback** - Leaseback is a financial arrangement in which the land is acquired and controlled, but not necessarily occupied, by the owner. The leaseback arrangement typically involves a two-step process. First, real estate is purchased by either a private firm or government entity. Second, the property is leased by the purchaser to a new tenant for specific uses in accordance with the approved plan for the area. This approach could be used within the 1994 noise contour area to acquire critical land areas and lease them for the development of compatible land uses.

4. CONCLUDING OBSERVATIONS

Strategies for minimizing possible conflicts within the existing mission area focus on land use regulations, noise level reduction techniques and municipal planning procedures. Within the maximum mission capability area both short and long-term strategies are suggested. The short-term strategy is similar to actions suggested for the existing mission, while the long-

term strategy involves a variety of additional techniques for land and/or easement acquisition. The implementation of the long term strategy is predicated on a change, in the future, of the operational mission for McConnell AFB.

In addition to minimizing possible land use conflicts associated with aviation activities, some recommendations are also made relating to general security issues and the development of land adjacent to the installation.

All of these actions will require continuous formalized cooperation among officials from Sedgwick County, the Cities of Derby and Wichita and the U.S. Air Force. Part of this cooperation should involve joint meetings on a regular basis as well as an open exchange of information regarding possible changes in future land uses and mission operations at McConnell AFB.

CHAPTER I
INTRODUCTION AND STUDY AREA OVERVIEW

During the past several decades the U.S. Department of Defense (DoD) has become increasingly concerned about the impacts of land development adjacent to military installations. Across the country incompatible residential and commercial development patterns have created conflicts between the operation and training missions of military bases and local communities. These land use conflicts, often referred to as encroachment, could eventually threaten public safety and livability due to a wide variety of concerns, such as aircraft noise, associated with military operations.

In 1985, the DoD instituted a cooperative process referred to as a Joint Land Use Study (JLUS) program to evaluate land use and development trends on property adjacent to active military facilities. The JLUS is normally initiated at military bases with aviation facilities after the completion of an Air Installation Compatible Use Zone (AICUZ) study that examines possible noise and other related impacts associated with aviation activities. The JLUS is then used to identify actions that could be taken by the community and military installation to solve existing problems and prevent future ones.

In September 2004 the County of Sedgwick, Kansas received financial support from the Office of Economic Adjustment (a DoD agency) to initiate a Joint Land Use Study relating to McConnell Air Force Base. Located in Sedgwick County in south-central Kansas, McConnell AFB is part of the greater Wichita metropolitan area, which is home to a number of aircraft manufacturing plants and other aircraft related industries. The team of RKG Associates, Inc. and Ricondo & Associates, Inc. was retained to assist the inter-jurisdictional partnership of the City of Derby, the City of Wichita, Sedgwick County, and McConnell AFB, under the coordinating efforts of the Wichita-Sedgwick County Metropolitan Area Planning Department (MAPD), in preparing this JLUS.

This report is divided into four chapters, including this introductory chapter, which discusses the project purpose as well as providing an overview of the Wichita economy and a description of the project areas examined. The second chapter summarizes the recommendations and implementation strategy that have been developed for preserving McConnell's existing and future mission capability. The third chapter examines existing land use and aviation activities within the study areas as well as changes that have occurred in these areas over the last decade. This chapter also discusses existing land use and aviation conflicts related to McConnell's current mission. Finally, chapter four presents an

examination of potential land use conflicts, based on projected growth trends, that could impact future mission activities at McConnell AFB.

1. PROJECT PURPOSE AND APPROACH

There were two principle factors that resulted in the determination to conduct a JLUS analysis. One factor is the continuing process of urban development surrounding McConnell. The City of Wichita, with an approximate population of 344,000, abuts the Base along its northern and western perimeters. To the east and south of McConnell AFB rural unincorporated areas of Sedgwick County have developed over the last 30 years with hundreds of rural residential estate lots. Adjoining this area to the south is the City of Derby, a smaller city of approximately 18,000 residents, that has been experiencing rapid growth, which is also influencing development patterns around McConnell AFB.

The second factor that triggered the undertaking of this JLUS was a recent change in mission for McConnell AFB. In 2002, McConnell's mission changed from operating B-1, C-12, and F-16 aircraft to operating KC-135 aircraft. Due to this change, the size of the area around the Base affected by aircraft noise was reduced considerably, which resulted in the need to update the Air Installation Compatible Use Zone (AICUZ) study. Aircraft operations related to the previous mission are referred to as the ***maximum mission capability*** for McConnell, since it most likely represents the highest level of activity, as well as the largest noise impact area, reasonably expected to occur at the facility. The current operations associated with KC-135 aircraft are referred to as the ***existing mission***. A primary requirement of this JLUS analysis, and one which added to the complexity of this project, was to develop a land use strategy for minimizing potential future conflicts with McConnell's maximum mission capability even though there is presently no need for regulating the larger noise impact area given existing mission activities. Although it is possible there may be a return to the maximum mission, as well as other missions that may vary from the existing mission, there is no certainty as to if or when such a change might occur. Therefore, it was necessary to consider alternative land use strategies that allow for flexibility in land development and management activities around McConnell, if it is determined that preservation of the installation's maximum mission capability is an important goal for the community to pursue.

In light of this recent mission change, several key goals were identified as being of primary importance to address as part of the JLUS process, including the following.

- Protect and promote the present and future operational/mission capacity of McConnell AFB
- Promote the long-term health, safety and welfare of the civilian and military community associated with, and in proximity to, McConnell AFB
- Evaluate the appropriateness of existing regulatory and non-regulatory measures within the study area to prevent future urban encroachment into McConnell's 1994 AICUZ area and ensure compatibility between competing land and air space uses (civilian and military)
- Develop ongoing public education/awareness initiatives to help implement JLUS recommendations

In response to the goals outlined above, a scope of work was established that was designed to help the community and the military achieve the desired outcome. This Joint Land Use Study has addressed these concerns through the completion of the four principle tasks listed below.

- Analysis and mapping of existing land uses as well as an assessment of land use changes since 1995 – this task also included an evaluation of long-range planning efforts for areas adjacent to McConnell AFB
- An examination of aviation activities at McConnell AFB as well as Colonel James Jabara Airport and nearby civilian aircraft testing facilities
- An assessment of future development potential in the study area and the identification of existing and possible future land use conflicts
- Identification of recommendations that could result in a reduction of potential land use conflicts with future operations at McConnell AFB

In order to ensure that the goals of the JLUS process were achieved, an organizational structure was created that established two oversight committees, a Policy and a Technical Committee. These committees were comprised of local residents and officials, as well as representatives from the business community and McConnell AFB. These committees provided guidance and direction to the consulting team concerning the completion of the JLUS report, as well as the final recommendations. In addition to periodic meetings of these committees, a public review process was also conducted as part of the JLUS in order to identify concerns of area residents and property owners with regard to current and future operations at McConnell. Public meetings were held after the completion of the two JLUS progress reports that were ultimately combined into this final report. These public meetings were held at the Colvin Elementary School in Wichita, and at the Municipal Court Building in Derby. Meetings were held at these locations respectively, on January 12 and 13, and then again on April 12 and 13, in 2005. Informational slide presentations were made at all four of these meetings and summaries of the major findings and conclusions, which are contained in the Appendix, were distributed to those in attendance. In addition, all draft reports, slide presentations, handouts, and other work products were made available for review on the county's website.

2. HISTORY OF WICHITA AND McCONNELL AFB[2]

The City of Wichita traces its beginnings back to 1868, when J.R. Mead founded a trading post on the banks of the confluence of two rivers, the Arkansas and the Little Arkansas. For centuries, this location had also served as a trading place for Native Americans. In 1868 a Wichita Town Company was organized with Mead and six others as original incorporators. Wichita was incorporated as a city of the third class on July 21, 1870. One hundred twenty-three men and one woman signed the original incorporation petition. Within a year of incorporation, Wichita experienced phenomenal growth, due largely to the cattle trade from Texas.

[2] Based on the following sources that are excerpted from the Wichita Area Chamber of Commerce and the McConnell AFB websites: Dr. Craig Miner, The Wichita State University; "Wichita Century" by R.L. Long; and "Visions from the Heartland" by Howard Inglish.

Wichita fell on hard times in the late 1870s when the cattle trade moved further west to take advantage of the construction of rail lines. However, by 1880, the city had rebounded with a growing economy in agriculture and manufacturing. Even though the cattle trade lasted only three or four years, its presence assured Wichita's position as a commercial hub. Manufacturing and agriculture industries were thriving in the late teens and early 1920s and it was around this same time that aviation entrepreneurs moved in to take advantage of the benefits of a prosperous oil industry, agreeable climate and wide open spaces that were perfect for building and testing new flying machines. A number of important businessmen, such as Lloyd Stearman, Walter Beech, Clyde Cessna, E.M. Laird, J.M. Mollendick and George Weaver were responsible for initial development of the aircraft industry in the area. Laird started the Swallow Airplane Company to build the Swallow airplane that had been designed in Chicago. Beech, Stearman, and Weaver all worked for Laird and Mollendick until each went on to establish his own company. Stearman's company later was purchased by The Boeing Company of Seattle, which went on to become Wichita's largest employer. The Beech (now Raytheon Aircraft Co.) and Cessna companies continue today, as does Learjet (now Bombardier Aerospace Learjet), founded by William Lear in the mid 1960s. It was through the efforts of these aviation pioneers that Wichita earned the title of "Air Capital of the World."

The establishment of McConnell AFB is closely tied to the origins of the aviation industry in Wichita and efforts to create a municipal airport in the city. In 1916, as the country prepared to enter World War I, the City of Wichita started buying land to build a municipal airport at the urging of the growing base of aircraft manufacturing companies. However, it was not until 1929 that construction crews broke ground on the facility. Completion was delayed for almost six years due to the Great Depression.

In 1942 the Army Air Force Material Center (Material Command) established its headquarters in the Wichita Municipal Airport Administration Building, which consisted of one hangar and three small warehouses. The Material Command chose this site to take advantage of the airport's five, 50-foot wide runways, each with a 60,000-pound wheel load capacity. In 1945, the Material Center moved to Oklahoma City, Oklahoma as the 4156th Army Air Field Base Unit arrived at Wichita to service and maintain transient and locally based aircraft. One year later, this unit disbanded and the Air Force would not return for several years.

In 1951, the Air Force moved back to the Wichita Municipal Airport and changed the name to Wichita AFB. For the first six months after the activation of the Wing Command, a "tent city", which consisted of 174 tents, a fire tower, and a few leased buildings in Wichita, housed the initially assigned personnel. From 1954 to 1956, a $22 million construction program turned the old airport into one of the Air Force's major bases. In April 1954, the base became McConnell Air Force Base in honor of the "Flying McConnell Brothers" who where from Wichita and served in World War II.

Numerous mission changes have occurred at McConnell between its inception and the establishment of the Base’s current mission. Around 1960, the Strategic Air Command (SAC) selected the site for 18 Titan II missile complexes for the newly activated 381st

Strategic Missile Wing (SMW). In 1972 McConnell saw the establishment of the 384th Air Refueling Wing (ARW). The Titan missiles were phased out and the 381st SMW was deactivated by 1986. The 384 ARW, which was re-designated as the 384th Bombardment Wing (Heavy) was the first wing to receive the R model KC-135 tanker as well as the B-1B Lancer bomber.

Currently, the 22nd Air Refueling Wing (ARW) is the host unit for McConnell AFB, which is one of only three wings to operate supertanker KC-135 Stratotankers for the Air Force. In addition, the 931st Air Reserve Group and the Kansas Air National Guard's 184th Refueling Wing are also part of the team presently operating at the Base. In 2002, as part of a plan to reduce and consolidate the Air Force's B-1 fleet, the 184th Bomb Wing's B-1s were transferred to other bases at which time the 184th took on a new mission flying KC-135s. The unit was also officially designated as the 184th Air Refueling Wing.

3. WICHITA'S ECONOMY AND THE IMPACTS OF McCONNELL AFB

This section provides an overview of economic conditions within the Wichita Metropolitan Statistical Area (MSA). The economic information presented here is based on an analysis recently completed by the Center for Economic Development and Business Research (CEDBR) at Wichita State University (WSU). Also briefly discussed are the estimated impacts on the regional economy related to the operation of McConnell AFB.

Wichita's employment includes a broad mix of business types, with a strong base of relatively high paying manufacturing jobs. However, a significant component of the local economy is also comprised of small and mid-sized companies providing a wide variety of goods and services to markets around the globe. As an illustration of this fact the 2001 County Business Patterns indicated there where approximately 11,580 business establishments in Sedgwick County that had fewer than 100 employees. A list of Wichita's major private employers includes the Boeing Co., Cessna Aircraft Co., Raytheon Aircraft Co., Via Christi Regional Medical Center, Bombardier Aerospace Learjet, Dillon Stores, Koch Industries Inc., Wesley Medical Center, AGCO Corp., The Coleman Co., Wichita Clinic, Bank of America and Southwestern Bell.

The Wichita metropolitan area is comprised of three counties including Butler, Harvey and Sedgwick. During the decade of 1992 through 2002, total wage and salary employment within the metro area grew by 13.7%, or an average of 1.4% annually. In addition, during that time period approximately 34,000 net new jobs were created. However, more recently, total wage and salary employment in the MSA experienced a net loss of approximately 7,400 jobs in 2002 and 7,200 in 2003, according to CEDBR estimates.

Several of the economy's better performing sectors over the last decade included Education, Health Care, Government, Manufacturing, and Leisure & Hospitality. Education and Health Care services added the most net new jobs in the past decade (7,300) followed by Government (6,300), Professional & Business Services (4,200), Manufacturing (3,700) and Leisure & Hospitality (3,400) sectors. As of year-end 2004, Manufacturing was the largest employment sector followed by the Education & Health Services, Government and Retail Trade sectors.

In 2002 the U.S. economy started a slow, weak recovery. This was not the case, however, in Wichita. Following the terrorist attacks of September 11, 2001, four of Wichita's aircraft manufacturers experienced immediate and continuing order cancellations. In the 2004 update of its annual economic outlook report, the CEDBR noted that some aircraft employees had been called back, but they represented only a fraction of the 15,000 employees laid off since 9/11. However, as of 2004 the Wichita economy has started to show signs of recovery, based on WSU's Leading Economic Indicators suggesting modest growth over the next several quarters, although not within all sectors of the economy. Forecasts by CEDBR for 2005 anticipate the addition of approximately 4,300 net jobs.

An estimate of the role that McConnell AFB plays within the regional economy was presented in the most recent AICUZ study completed in 2004. This analysis examined the direct economic impacts associated with expenditures related to on-base activities, as well as the indirect impacts related to jobs and expenditures within the area's economy. The economic estimates were based on a geographic area within a 50-mile radius of McConnell. According to the AICUZ study, payroll and annual Base-related expenditures, combined with the estimated value of local wages in the affected area, resulted in an estimated total impact of over $396 million in the area's economy due to the operation of McConnell. The majority of this economic impact was attributed to payroll, retirement benefits, and contracts provided by McConnell AFB, which employs over 3,900 personnel with an annual payroll of approximately $160 million. It is estimated that the direct economic impacts related to McConnell's operations results in the support of 1,758 jobs within the affected regional area. Table 1 summarizes annual expenditures for McConnell and Table 2 provides annual payroll expenditures at the Base in 2003.

Table 1
Annual Expenditures – 2003
McConnell Air Force Base

Category	Expenditures
Construction	
Military Construction Program	$9,888,995
Military Family Housing	$4,351,158
Non-Appropriated Fund	$613,960
Operations and Maintenance	$23,854,294
Other	$630,634
Subtotal	$39,339,043
Contracts	$24,557,352
Other Materials, Equipment, Supplies	$125,452,482
Total	**$189,348,876**

Source: McConnell AFB Economic Impact Analysis, FY2003

Table 2
Annual Payroll – 2003
McConnell Air Force Base

Category	Payroll
Military	$127,364,875
DoD Civilian	$19,949,053
Non-Appropriated Fund, Contract Civilians, and Private Business	$4,361,510
Total	**$151,675,438**

Source: McConnell AFB Economic Impact Analysis, FY2003

4. DESCRIPTION OF AICUZ STUDIES

The U.S. Air Force (USAF) conducts Air Installation Compatible Use Zone (AICUZ) studies to encourage a cooperative planning effort between the Air Force and communities surrounding military installations to promote compatible land uses around its military bases. The primary goals of the AICUZ are to maintain the integrity of the installation's mission, while minimizing negative impacts to the neighboring properties related to noise exposure and accident potential. One product of an AICUZ study is the creation of noise exposure maps which provide a graphic representation of the annualized aircraft noise impact that would be typical for the Air Force Base and its environs. A computer model is used to calculate noise exposure, which is based upon several inputs, such as weather data, airport operations or runway use data, as well as aircraft type and frequency of flights. The time of day, or "day/night split" is critical because nighttime operations (between 10:00 p.m. and 7:00 a.m.) are more disruptive and therefore have a "penalty" or more stringent weighting within the model.

Land use compatibility planning for an AICUZ is based in part on these noise exposure contours. Noise contours are developed to define areas exposed to the Day-Night Average Weighted Sound Level (DNL) of 65 decibels (dB) and higher. This is the level of noise "significance" recognized by the USAF, U.S. Department of Transportation (USDOT), the Federal Aviation Administration (FAA) and other federal agencies.

As noted in the introduction, McConnell AFB experienced a change of mission in 2002. Prior to this time the Base was operating within the parameters outlined in the 1994 AICUZ study. The mission at that time, and up to 2002, included a high percentage of B-1B "Lancer" aircraft activity, which is a very loud jet aircraft. The noise characteristics of this aircraft and the overall fleet, combined with the number of sorties or missions flown at McConnell, resulted in noise contours that encompassed an area approximately 17,000 acres in size.

In 2004, the 1994 AICUZ Study was revised due to the reassignment of the B-1 aircraft and related operations to other installations and a corresponding change in mission for the 384th ARW to a KC-135 refueling wing. This change in aviation activity warranted an update of the AICUZ study in order to reassess noise exposure levels.

Figure 1 illustrates the 1994 noise contours in comparison to the recently delineated 2004 noise contours. This figure shows that the 1994 contours encompassed a significantly larger area than the 2004 contours, resulting in a reduction in total acreage impacted by higher noise levels from approximately 17,000 to 2,500 acres. This adjustment to the noise contour area is affected by changes to the type of aircraft, frequency of flights, and particularly nighttime compared to daytime operations at the Base.

In addition to identifying potential noise exposure, the AICUZ study also delineates zones at the end of a runway that correlate to the Air Force's statistics on accident potential during take-offs and landings. There are three different zones used to identify the risk potential in these areas. One is the Clear Zone (CZ), which is closest to the end of the runway and which

has the highest potential for accidents. Adjoining the CZ are two Accident Potential Zones (APZ), APZ-I and APZ-II, where the potential for accidents diminishes as the distance from the end of the runway increases. These areas are defined by a specific distance established from the end of the runway, which have a combined length of 15,000 feet, and a width of 3,000 feet from the centerline of the runway, and a total approximate acreage of 2,600. Each zone has varying degrees of recommended restrictions with regard to compatible land use. In CZs, the Air Force policy is to acquire property through purchase or easement where possible; in APZs the policy is to encourage lower densities and specific types of land uses[3]. The boundaries of the CZs and APZs are based on the Air Force's assessment of accident potential and are not affected by a change in the Base's flight activity or mission status.

5. DESCRIPTION OF PROJECT STUDY AREAS

In accordance with the specified scope of work for this JLUS, data related to four different, but generally coincident, study area boundaries have been analyzed in order to assess the potential land use conflicts related to operations of McConnell AFB. All four of these areas are illustrated in Figure 1. Three of these areas were described in the previous section and include the noise contour areas from the two AICUZ studies as well as the Clear Zones (CZ) and Accident Potential Zones (APZ). The fourth is the Joint Land Use Study Area (JLUSA) that represents the immediate area of influence around McConnell Air Force Base. The JLUSA is bounded by E. Kellogg Street to the north, S. Greenwich Road to the east, Meadowlark Road to the south, and Clifton and Oliver Avenues to the west. State Highway 135 (Kansas Turnpike) traverses across the study area from the northeast corner to the western boundary while State Highway 15 (Southeast Blvd.) cuts across the southwest corner. McConnell AFB lies essentially in the middle of the study area and is flanked by the City of Wichita to the north and the City of Derby to the south. The remaining land outside the limits of these two cities represents unincorporated portions of Sedgwick County, which encompasses the Base to the east, south, and west.

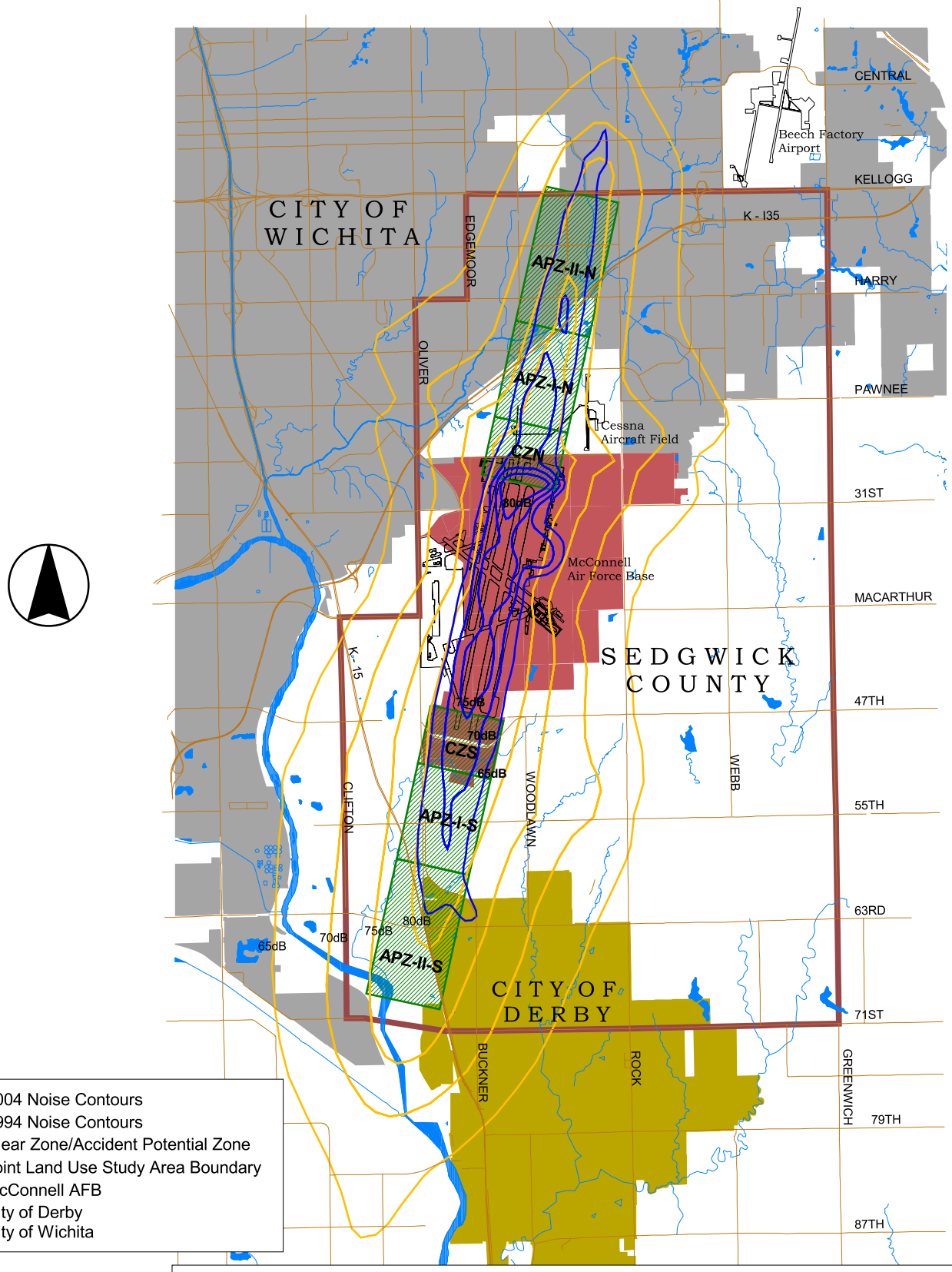
For the purposes of this study, as noted earlier, the 2004 AICUZ noise contour area is referred to as the *existing mission* area, while the 1994 AICUZ area is referred to as the *maximum mission capability* area. As noted, these noise contour areas are considerably different in size (with regard to the land area they overlay) due to the change in types of aircraft operating at the Base. It is assumed that the 1994 AICUZ represents the largest area affected by the type or number of aircraft that would potentially operate at McConnell and therefore, constitute its maximum mission capability.

[3] McConnell Air Force Base AICUZ Study, 2004.

Study Area Base Map

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



Prepared by RKG Associates, Inc. - May 2005
Source: 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure 1

The boundaries of these two mission areas were used in conjunction with a set of Land Use Compatibility Guidelines (LUCG) to evaluate potential conflicts with existing and future Base operations. The LUCG standards are the Federal guidelines[4] commonly used when conducting Joint Land Use Studies and are the same standards used to evaluate potential conflicts in the 2004 AICUZ study. LUCG are summarized in the Appendix, as well as in the accompanying sidebar presented here. The LUCGs identify those land uses that are recommended, not recommended, or recommended under certain conditions (e.g. if noise level reduction measures are implemented), within the CZ/APZ areas as well as the noise contour areas.

Overview
Land Use Compatibility Guidelines (LUCG)

The two central issues related to land use compatibility around McConnell AFB are safety and noise. The fundamental principles of compatibility criteria are:

- Limit exposure of people and noise sensitive activities to high level noises, and
- Limit concentrations of people and safety sensitive activities in areas of highest probable accident impact.

Examples of land uses that are susceptible to higher noise levels (e.g. greater than 65dB) include:

- Residences and places were people sleep, such as hotels, hospitals, and nursing homes
- Uses such as schools, libraries, churches, museums, theaters, and uses where it is important to avoid interference with speech, and concentration on reading or visual material.

Land uses that result in concentrations of people that are incompatible with high hazard zones, which include the Clear Zone and APZ-I and APZ-II, include:

- Residences and similar uses where people reside, such as hotels or nursing homes
- Employment uses with high density of employees, such as offices or labor-intensive industrial uses
- Uses where people gather in large numbers such as churches, schools, shopping centers, restaurants, and spectator sports

[4] *Guidelines for Considering Noise in Land-Use Planning and Control,* Federal Interagency Committee on Urban Noise, 1980, and the *Standard Land Use Coding Manual,* U.S. Department of Transportation.

CHAPTER II
RECOMMENDATIONS AND IMPLEMENTATION STRATEGY

One of the primary goals of this JLUS analysis is to develop a *preferred land use plan* that can be used to guide future development on privately owned land within the area affected by operations at McConnell AFB. The role of the preferred land use plan is to identify land uses that are compatible with McConnell's mission while also attempting to balance the needs of the community and the rights of landowners whose property lies within the affected area. In this case, the affected areas are defined by three distinct boundaries discussed throughout this report including, the Clear Zones/Accident Potential Zones (CZ/APZ), the 2004 Noise Contour Area and the 1994 Noise Contour Area. Minimizing development within the CZ/APZ areas is important from a risk management and public safety standpoint because during take-offs and landings these zones are considered the most likely points of impact if in an unlikely event an accident occurred. Reducing potential conflicts within the noise contour areas is important because continuous exposure to noise can be hazardous and can lead to discontent within the adjoining community, resulting in diminished support for long-term operation of the facility.

A tangent issue to potential land use conflicts is the concern related to anti-terrorism and force protection (AT/FP) which is discussed in Chapter IV of this report. Minimizing potential impacts relating to AT/FP issues are somewhat parallel to the AICUZ areas noted above, but the preferred land use plans for each are not necessarily identical or completely compatible.

One factor that contributes to the complexity of land use compatibility issues around McConnell AFB is the desire to maintain a preferred land use plan that would preserve the maximum mission capability of the facility. For the purposes of this study, the maximum mission capability impact area is defined by the footprint of the 1994 Noise Contour Area since this represents the largest geographical area that would potentially be affected by the types of aircraft that would conceivably operate at McConnell. This footprint also includes the land within the CZ and APZ areas. However, the existing mission impact area for McConnell is defined as the 2004 Noise Contour Area footprint, an area much smaller than that of the maximum mission capability area.

The crux of developing a preferred land use plan that addresses the current mission, but which also keeps open the potential for expanded mission requirements, is the lack of, or uncertainty, about the time frame in which a change in mission status could materialize.

Currently there is no definitive answer to this question. In order to address this issue a two-pronged approach is recommended for establishing a preferred land use plan around McConnell that includes both a short-term and a long-term strategy.

One observation that inevitably arises with regard to minimizing future land use conflicts around McConnell is the fact that much of the land to the north, within Wichita's city limits, has already developed at densities, and with types of uses, that do not reflect the Land Use Compatibility Guideline standards. The same is true for areas south of the Base that lie within the City of Derby's municipal limits. Both of these areas, which lie within the 1994 Noise Contour Area, contain high density residential development that has not been constructed with Noise Level Reduction (NLR) measures to help mitigate the impact of aircraft noise generated from the Base. There are non-residential and public uses in these areas as well that are also considered to be noise sensitive and that do not have the benefit of NLR measures.

The question then is why is it necessary to protect the remaining undeveloped land in the affected area if other incompatible development already exists? Part of the answer to this question lies in the fact that development conflicts, and their potential impacts on military installation operations, are cumulative in nature. When the oversight agency, such as the U.S Air Force or Department of Defense, evaluates the long-term viability of operating a military installation, it is generally accepted there will be some level of negative impact that occurs as development encroaches on a facility's area of influence. However, there is a point at which a development threshold is crossed where the benefits of continued operation of the facility are outweighed by the ever-increasing conflicts, problems with lighting, dust, radio interference and other security and safety hazards that have evolved over time. Although these types of conditions are only one factor that is considered in an evaluation process such as Base Realignment and Closure (BRAC), it can be an important factor when an installation such as McConnell is compared to other facilities around the country that might have fewer encroachment issues. The cumulative impacts of encroachment can also be an important consideration when future mission assignments are considered as well.

Another part of the answer to the question of why protect the remaining undeveloped land is that the noise impacts associated with aircraft take-off tend to have a greater affect on nearby land uses than do landing activities. McConnell's flight patterns primarily involve take-off at the southern end of the runway, which is the portion of the Study Area that still contains the largest amount of potentially developable land. Therefore, minimizing future development to the south of McConnell would serve to reduce potential conflicts associated with noise impacts in the area where there is more likelihood for complaints to occur.

Table 3 presents a summary of the proposed JLUS recommendations, as well as an approximate time frame for implementation. Following the Table is a more detailed description of each recommendation as well as some optional actions that are not included in the matrix, but which the community may want to consider based on the changing land use conditions that may evolve around McConnell in the future. It is assumed that the Metropolitan Area Planning Department (MAPD) will be the lead organization to initiate implementation of the recommendations in Table 3, or, will work with other appropriate

agencies and organizations to establish outlined alternative methods of implementation as needed.

Table 3
McConnell JLUS Recommendations and Implementation Strategy

#	Recommendation	Purpose	Time Frame
1	Establish McConnell/JLUS Implementation Coordinating Committee	Establish oversight committee to monitor changes in McConnell's on-going mission and to ensure that recommendations are implemented to fullest extent possible	2 months
2	Revise and Continue to Implement Current Regulatory Requirements	Minimize future safety hazards by managing growth in CZ/APZ areas with existing Airport Overlay (A-O) and B-5 zoning regulations. Revise A-O standards to more fully comply with LUCG standards.	6 months
3	Institute Noise Level Reduction Measures in Local Building Codes	Minimize potential future noise related impacts on remaining undeveloped land within the existing mission's noise contour area	12 months
4	Negotiate Agreement with Cessna Aircraft Company	Work with Cessna to obtain agreement/easement intended to protect undeveloped land owned by company in northern APZ-I area to minimize safety conflicts with McConnell's future operations	12 months
5	Establish Real Estate Disclosure Process	Minimize potential future noise related conflicts by inserting notification requirement into real estate transfer process that ensures prospective property buyers are aware of aircraft noise impacts from McConnell	6 months
6	Initiate Land Protection/Acquisition in Accident Potential Zone (APZ) Areas	A land (or easement) acquisition program of remaining undeveloped land in the APZ safety areas would be a more proactive and permanent approach (than provided by zoning regulations) to minimizing land use conflicts with McConnell's future operations	18 months
7	Maintain Flexibility in Future Land Use/Rezoning Process	Delay formal adoption of long-range planning and rezoning currently being considered by host communities around McConnell. Allow 2-3 years to determine potential for mission change that might impact larger noise contour area than presently affected by Existing Mission	24-36 months
8	Address Anti-Terrorism and Force Protection Concerns through Protective Overlay Zoning	Integrate anti-terrorism mitigation measures into local land use development review process. Establish design guidelines to promote consistency in evaluating development proposals that could affect safety concerns around McConnell's perimeter.	12 months

Table 3 (continued)			
Maximum Mission Capability Strategy (Short-Term)			
#	**Recommendation**	**Purpose**	**Time Frame**
1	Implement all of the proposed recommendations identified under the Existing Mission Strategy above	Minimizing conflicts in McConnell's Existing Mission area (CZ/APZ and 2004 Noise Contour areas) in the short-term will also support the Maximum Mission Capability area, which encompasses the smaller Existing Mission area.	Same as above
	a) Establish JLUS oversight committee b) Revise and continue implementation of existing land use regulations c) Institute noise level reduction measures in building code d) Negotiate agreement with Cessna to protect APZ area e) Establish real estate disclosure process in noise impact area f) Initiate land protection/acquisition of undeveloped land in APZs g) Allow flexibility in implementation of long-range plan/zoning h) Address anti-terrorism concerns around perimeter of McConnell		Same as above
Maximum Mission Capability (Long-Term)			
#	**Recommendation**	**Purpose**	**Time Frame**
1	Manage growth within Maximum Mission area based on Land Use Compatibility Guidelines (LUCG). Consider adopting Protective Overlay zoning to enforce these standards.	With the proposed Future Land Use Plan as a basis, use the LUCG standards to minimize incompatible land uses in the Maximum Mission area. These standards would serve to reduce potential land use conflicts in noise sensitive areas.	3 months
2	Purchase undeveloped land in noise sensitive areas	Consider acquisition of land within noise sensitive areas as a more permanent means of preserving McConnell's Maximum Mission Capability. Establish hierarchy of land area to purchase (e.g. APZ, 80+dB, 75-79dB, 70-74dB, 65-69dB).	2+ years
3	Acquire easements for undeveloped land in noise sensitive areas	Acquire easements, as opposed to fee-simple purchase approach presented in #2 above, which would allow for development to occur but uses would be restricted to those that are compatible with McConnell's long-term operations.	2+ years
4	Establish Transfer of Development Rights Program (TDR)	Use TDR as an alternative for managing future development in Maximum Mission area by transferring development potential within 1994 noise contours to a "target area" outside the noise impact area	2+ years
5	Establish Land Banking program to preserve Maximum Mission Capability area from incompatible land uses	A Land Banking program would involve purchasing undeveloped land within Maximum Mission area, by the local governing body or other entity, to hold for a prescribed period of time before reselling for future development. This approach would allow for controlling incompatible development over the short-term and also support a potential long-term development strategy for this area	2+ years

Table 3 (continued			
6	Establish a public/private leaseback program to preserve Maximum Mission area from incompatible land uses.	Similar to land banking, a leaseback program would involve purchasing undeveloped land in Maximum Mission area by a local entity. However, unlike land banking, the land would be made available for development through lease arrangements that would prohibit incompatible land uses.	2+ years

1. RECOMMENDATIONS – EXISTING MISSION

The preferred land use plan for supporting the existing mission should focus on implementing a strategy designed to minimize development within the Clear Zones (CZ) and Accident Potential Zones (APZ). Addressing this issue is of primary importance for the existing mission, but it would also serve to support the maximum mission capability as well. The footprint of the 2004 AICUZ noise contours, which represents the affected area for current aircraft activities, is almost completely contained within the boundaries of the CZ and APZ areas with exception of two small areas at the northern and southern tips of the 65-decibel (dB) contour, which are both essentially completely developed. Therefore, a strategy aimed at protecting the CZ/APZ areas would also minimize potential noise conflicts associated with the noise contour areas.

Presently, development within the majority of the CZ/APZ areas is regulated by the Airport Overlay (A-O) district under the Wichita-Sedgwick County Unified Zoning Code. A small portion of the APZ-II-S zone is controlled by the City of Derby's B-5 zoning district, but there is relatively little undeveloped land remaining is this district. However, within the A-O district there are approximately 1,080 acres of potentially developable land. Of this total, approximately 430 acres are located in the northern zones where 340 undeveloped acres are owned by the Cessna Aircraft Company which is partially protected by an easement on 90 acres. The remaining 650 acres are located in the southern APZ areas.

Although the development criteria contained in the A-O district regulations are largely in compliance with the Land Use Compatibility Guidelines (LUCG), there are a few exceptions that should be addressed. These include the fact that significant land uses, including asphalt plants, warehouses, and wholesale businesses, are permitted in the Clear Zones where the LUCGs recommend only agricultural uses. In the APZ-I zones the A-O district permits low-density residential development, which is not recommended in the LUCGs. The A-O also permits a variety of commercial uses in the APZ-I zone that are not recommended within the LUCG standards.

An important consideration related to the LUCG standards is that they represent what are considered to be *minimum impact requirements,* in that they are largely tailored to reduce land use conflicts while also allowing for some reasonable levels of development to occur on privately-owned land. One drawback to the LUCG standards is that they are used only as guidelines and not always mandated or enforced in the stricter sense of a typical land use regulation, such as zoning regulations, which inevitably leads to variability in the consistency of their application to all development proposals. This is illustrated by the fact that Wichita,

Sedgwick County, and Derby have adopted zoning and subdivision controls to reduce conflicts around McConnell, but have never adopted complementary noise control measures, which are equally important. As noted previously, even with the use of LUCGs as a basis to reduce land use conflicts around a military installation, the cumulative impacts of long-term growth can still affect an installation's viability to carry out its mission in an efficient manner. Therefore, the recommendations presented in the following section for preserving the existing mission status for McConnell AFB employ both a regulatory approach as well as alternative methods that offer more permanent protection from future land use conflicts.

1.1 Recommended Actions

1) **Establish Oversight Committee to Monitor Changes Around McConnell** –A key purpose of this Joint Land Use Study is to provide guidance regarding land use decisions by the local jurisdictions in the vicinity of McConnell AFB, but it is not a legal document and therefore has no force of law to ensure its recommendations are implemented. In light of this fact, it is strongly recommended that an oversight committee be established as an on-going vehicle to continue the cooperation initiated by local communities and the military as part of this JLUS process. Establishment of a McConnell/JLUS Implementation Coordinating Committee (MICC) would provide a means to maintain communication between all the involved parties, monitor on-going changes regarding McConnell's mission status, and help to insure that the JLUS recommendations are implemented to the greatest extent possible. The MICC would potentially be comprised of representatives from Wichita, Derby, Sedgwick County, and McConnell, and could also include representatives from area landowners, businesses, and other local organizations that have an interest in supporting compatible uses around the Base. It is suggested that this committee meet quarterly to review issues related to this JLUS and the on-going mission at McConnell.

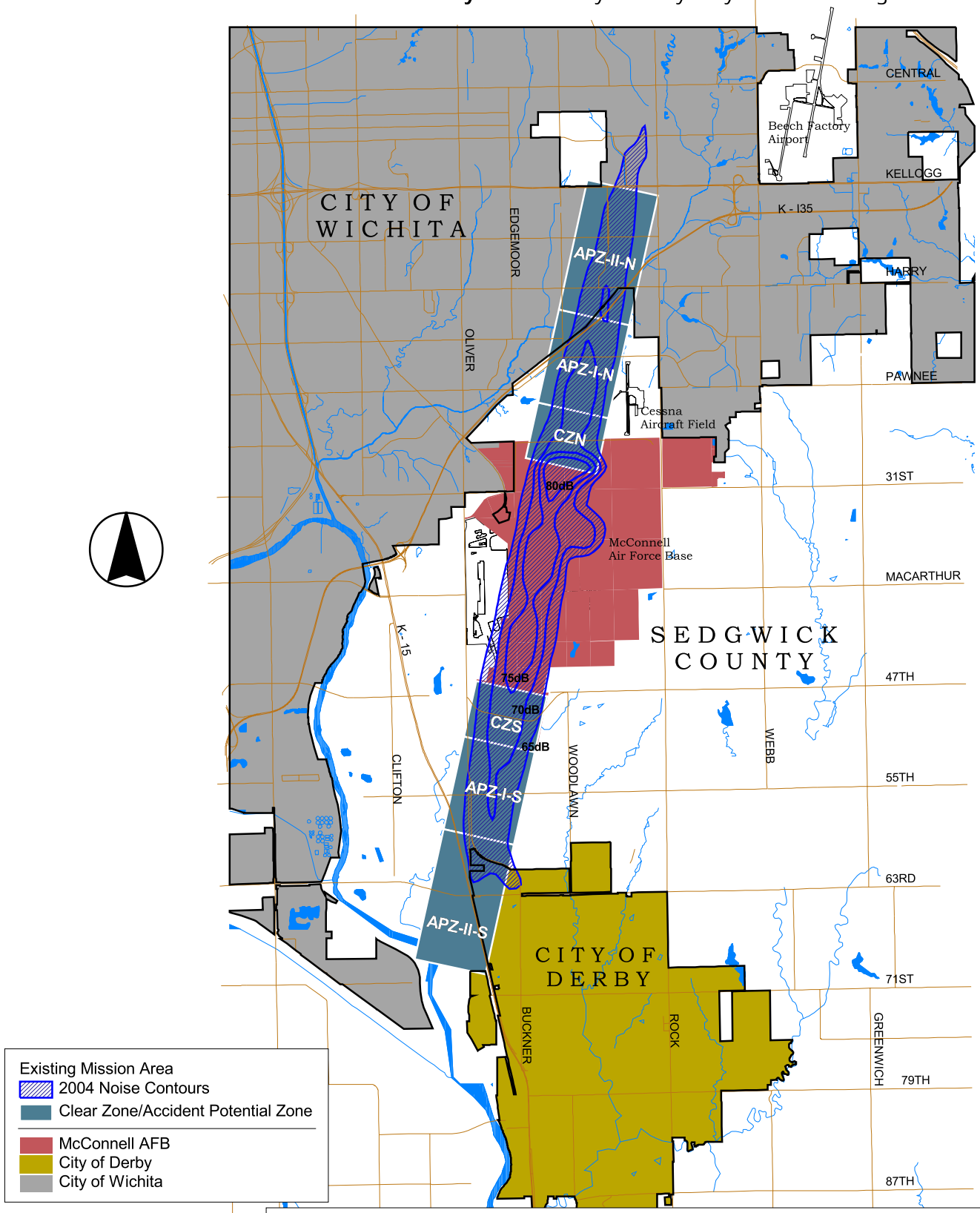
2) **Revise and Continue to Implement Current Regulatory Requirements** – Continue to manage growth within the CZ/APZ areas through the current regulatory measures contained in the Airport Overlay (A-O) zoning district (in Wichita and Sedgwick County), and the B-5 district (in Derby). However, action should be taken to address the deficiencies in the A-O district specifically identified in Chapter IV and should also re-evaluate all permitted uses in this district to minimize potential safety conflicts, as recommended in the LUCGs.

3) **Institute Noise Level Reduction Measures** – Consider amending existing building codes to include Noise Level Reduction (NLR) measures as recommended in the LUCGs. The remaining undeveloped land within the 2004 Noise Contour Area that would be affected by such measures is relatively small, totaling approximately 390 acres, almost all of which lies within the unincorporated portions of the county. Building construction standards, as well as other measures associated with implementing a comprehensive noise reduction strategy, are presented later in this chapter.

Existing Mission Area

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



Prepared by RKG Associates, Inc. - May 2005
Source: 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure 2

4) **Negotiate Agreement with Cessna Aircraft Company** – Sedgwick County and/or the City of Wichita should initiate discussions with the Cessna Aircraft Company with the intent of restricting future development on the approximately 250 acres of undeveloped land owned by the company in the northern APZ-I area. The goal of these discussions would be to obtain a Memorandum of Understanding (MOU), or similar type of agreement, that would restrict use of this land to agricultural activities for as long as McConnell continues to operate. If such an agreement cannot be reached, then Recommendation 6 below should be considered as an alternative approach to protecting this critical land area. The Air Force has previously negotiated a perpetual easement on 90 acres owned by Cessna in the northern Clear Zone.

5) **Establish Real Estate Disclosure Process** – There is currently no law or mechanism in place within the real estate transfer process that requires prospective buyers of property located in the 2004 Noise Contour Area to be notified that they are purchasing property in an area that is susceptible to noise impacts. It is recommended that such a notification process be established in a manner that most appropriately meshes with the county's existing real estate transfer process. However, any such process should involve permanent recording of a document that has been signed by the buyer indicating that such notification has been provided.

6) **Initiate Land Protection/Acquisition in APZ Areas** – As noted previously, the development of land within the Accident Potential Areas is currently regulated by the A-O and B-5 zoning districts respectively, within Wichita/Sedgwick County and the City of Derby. These zoning regulations are intended to minimize land use conflicts in the APZ areas in accordance with the LUCGs. Although this is an acceptable approach for reducing potential conflicts, it does have two drawbacks. One is that despite these regulations, the long-term cumulative impacts of development in the APZ areas can still have negative affects on McConnell's continuing mission. The other is that zoning is not permanent and can be changed at some point in the future due to a variety of economic, social, and political reasons. In light of these possibilities, it is recommended that initiation of a program to acquire the remaining undeveloped land within the APZ areas be considered. Acquisition of land within these zones would also serve to eliminate potential noise conflicts associated with the 2004 AICUZ as well as support preservation of the maximum mission capability land areas located within the 1994 AICUZ areas. The protection/acquisition of this land area, or the development rights associated with this land, could be accomplished through a number of techniques that are described later in this chapter.

7) **Future Land Use Plan/Rezoning Process** – The Metropolitan Area Planning Department (MAPD) is currently in the process of updating the future land use portion of the Comprehensive Plan for areas located in Sedgwick County. The City of Derby provided input for this regional plan and is also in the process of updating its own comprehensive plan. Overall, the proposed future land use plan offers a

number of appropriate planning concepts with regard to minimizing potential land use conflicts with the continuing mission of McConnell AFB. There are, however, a few issues to be considered with this proposed plan. The most critical issue revolves around the fact that the future land use plan is geared toward minimizing land use conflicts associated with the 1994 AICUZ areas that include the much larger noise contour footprint, as illustrated in Figures 2 and 3. However, there is no guarantee at this time that McConnell's mission will return to the status that reflects these AICUZ boundaries. Therefore, if this future land use plan were adopted at this time, it could lead to a rezoning and adoption of regulations, including noise level reduction measures in the building code, which may not be necessary. Therefore, it is recommended that the proposed future land use plan remain somewhat flexible at this time and the existing zoning remain in place for the next two to three years, or until such time as a more definitive determination is reached by the U.S Air Force and/or the Department of Defense, regarding the long-term status of possible future missions at McConnell. During this interim period the review committee outlined in Recommendation 1 above should meet at least quarterly to evaluate the status of McConnell's mission, based on the most recent information available.

8) **Address Anti-Terrorism/Force Protection (AT/FP) Concerns** – The issues associated with AT/FP, although not normally addressed as part of a JLUS process, are a related issue in that they are potentially affected by the types of land uses that exist, or could exist, within proximity to the perimeter of McConnell AFB. Given the current state of affairs in this country and around the world with regard to terrorism, the importance and necessity of addressing AT/FP issues is likely to continue to expand for the foreseeable future. It must be recognized that the issues related to AT/FP are still relatively new and continually evolving, and therefore the methods being developed to address such issues are also still being refined.

   It is recommended that representatives of McConnell AFB, the City of Wichita, Sedgwick County and the City of Derby establish a process for reviewing AT/FP issues within a specific framework, as opposed to on a case-by-case basis. One approach to establishing this process could be accomplished through implementation of the Protective Overlay (P-O) district as authorized in the Wichita/Sedgwick County (W/SC) zoning code. The P-O district (Article III, Section C, *Special Purpose and Overlay Districts* of the zoning code) can be applied in combination with any base or underlying zoning district, and allows for tailoring use or property development standards to individual projects or specific properties with the following objectives:

   - Ensure compatibility among incompatible or potentially incompatible land uses;
   - Ease the transition from one zoning district to another;
   - Address sites or land use with special requirements, and
   - Guide development in unusual situations or unique circumstances.

It is recommended that the aforementioned parties work together to determine the most appropriate size and location of how the P-O district should be situated around McConnell. It is assumed that the district could resemble a "buffer area" of a certain distance extending away from the Base's fence line. Representatives from McConnell should be responsible for recommending development review guidelines and standards that would be used to evaluate proposed activities within this buffer regarding potential impacts on AT/FP issues.

An alternative to using the P-O district for this purpose would be to establish an *encroachment district* as outlined later in this chapter. The establishment of encroachment districts was recently considered by the Kansas Legislature although it was not enacted at this time. If this legislation is reconsidered in the future it could be used to address AT/FP issues as well as other potential land use conflicts that have been identified as part of the JLUS.

2. RECOMMENDATIONS – MAXIMUM MISSION CAPABILITY

The maximum mission capability for the purpose of this JLUS is defined as the noise contour boundaries established for the 1994 AICUZ study, as illustrated in Figure 3. It also includes the CZ/APZ areas that have the same boundaries for both the existing mission (2004 AICUZ) and the maximum mission.

As noted previously, the time frame in which McConnell AFB might return to maximum mission status, or any other level of operations, cannot be specifically determined at this time. However, there is a desire to preserve all realistic options for Base operations since this facility is an important component of the area's economy as well as the nation's security forces. Maintaining McConnell's maximum mission capability will require flexibility and cooperation from all parties involved in the land use planning process including the Cities of Wichita and Derby, Sedgwick County, the U.S. Air Force, and property owners in the affected area.

Due to the uncertainty associated with a return to McConnell's previous operating mission (pre-2002), the recommendations for preserving maximum mission capability have both a short-term and long-term component. These alternatives are outlined below.

2.1 Recommended Actions – Short-Term

The short-term recommendations for preserving the maximum mission capability include all of the actions presented in the previous section of this chapter, which are intended to support the existing mission. The reason for this similarity is that recommendations related to the existing mission are primarily focused on minimizing land use conflicts within the CZ/APZ areas, which are equally important for the maximum mission operations as well. Based on this conclusion, the short-term strategy for helping to preserve the maximum mission capability would include the following.

1) Establish an oversight committee to monitor on-going land use and mission changes around McConnell AFB.

2) Continue regulatory control of future land uses in the CZ/APZ areas by means of the Airport Overlay (A-O) zoning district, with appropriate revisions as noted previously.
3) Consider instituting a noise mitigation plan within the areas impacted by the 2004 AICUZ noise contour area.
4) Negotiate MOU or easement with Cessna Aircraft Company to limit development on 250 acres of land owned by the company that is located in the northern APZ area.
5) Establish real estate disclosure process for properties transferred within the noise impact area of the 2004 AICUZ.
6) Initiate process to acquire remaining undeveloped land, or the development rights for this land, within the APZ areas.
7) Allow for flexibility in the implementation of proposed future land use plan for Sedgwick County, in the affected portions of the JLUSA, for two to three years (or less if circumstances warrant) in order to determine if a change in McConnell's mission status is imminent.
8) Address Anti-Terrorism/Force Protection concerns by establishing a buffer around the Base by means of either a Protective Overlay (P-O) zoning district or by creating an Encroachment Zone, if the legislation for this regulatory method is adopted by the Kansas Legislature.

2.2 Recommended Actions – Long-Term

The recommendations presented in this section are intended to support a long-term strategy for minimizing land use conflicts that could potentially affect McConnell's maximum mission capability. These recommendations would only be implemented if it is determined, within the next two to three years, that McConnell's mission status will be expanded and that such a change would involve a return to aircraft operations that affect land within the larger 1994 AICUZ area. Therefore, implementation of the following recommendations could be delayed during this interim time period unless it was determined that more immediate implementation would not conflict with the long-term future land use needs of Sedgwick County and the Cities of Wichita and Derby.

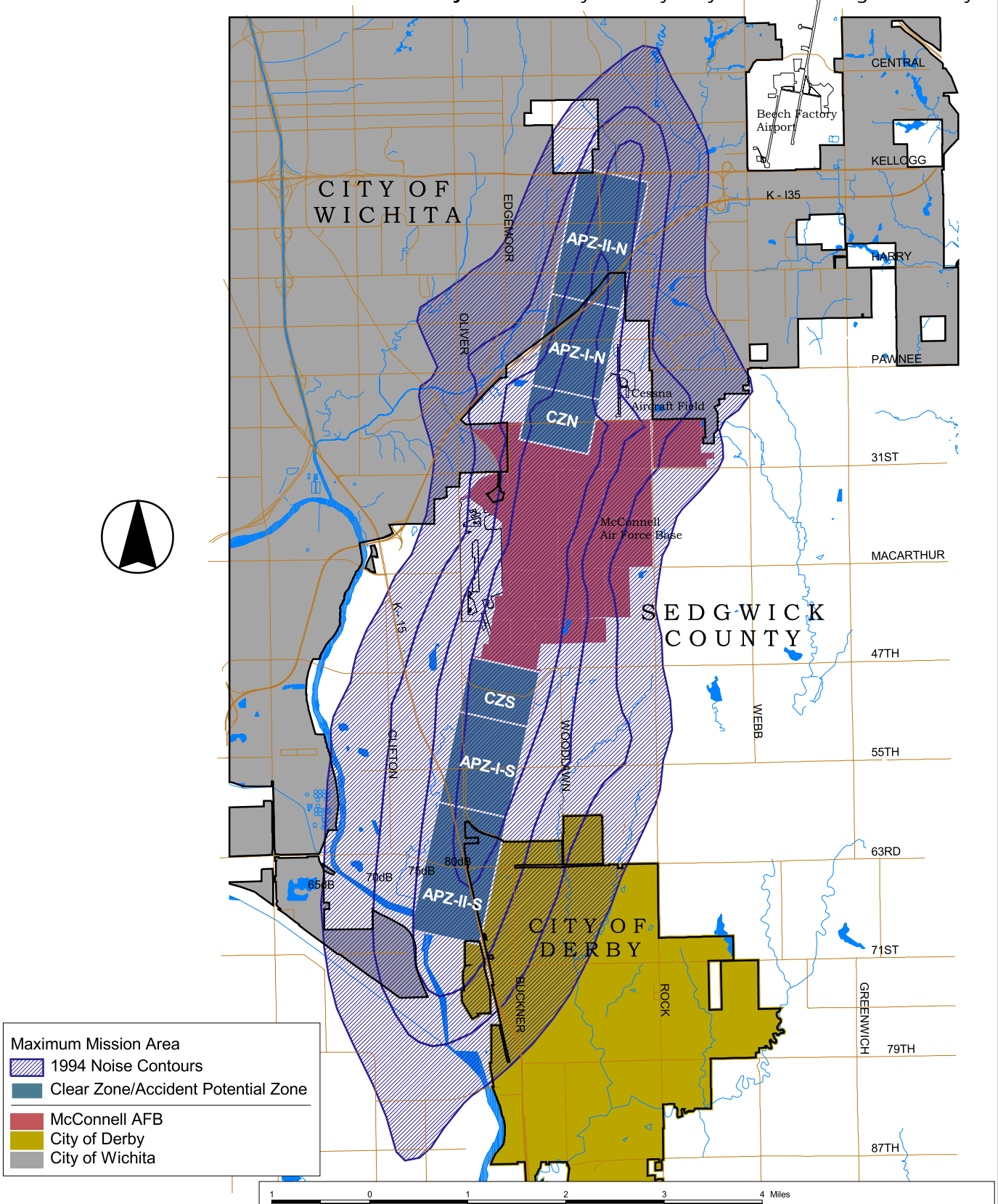
The management of long-term future land use conflicts related to the maximum mission capability is primarily focused on the remaining undeveloped land within the 1994 Noise Contour Area. This includes about 4,900 acres of which, approximately 1,000 acres are located in the APZ areas and therefore, would be addressed as part of the recommendations intended to preserve the existing mission status. The remaining 3,900 acres land, most of it comprised of unincorporated county land, are outside the aircraft hazard areas but subject to potential noise impacts. The alternative methods presented below would serve to reduce the potential for noise impacts, but also help to lessen the effects of impacts related to cumulative development around McConnell.

1) **Land Use Regulatory Actions** – Presently, there is no comprehensive noise management plan in place for land within the 1994 noise contours located in Sedgwick County or the Cities of Wichita and Derby. As noted in the preceding recommendations, the proposed future land use plan developed by MAPD offers a reasonable strategy for achieving a long-term preferred land use plan around

Maximum Mission Area

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



Prepared by RKG Associates, Inc. - May 2005
Source: 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure 3

McConnell with a few exceptions. One of these exceptions is a lack of adequate noise controls for non-residential and residential development. Another is the fact that some proposed residential areas of the future land use plan are not considered suitable for residential development, based on LUCG standards. These locations include areas with noise exposure higher than 75 dB where residential development is considered unsuitable even if noise level reduction measures are implemented.

As recommended previously, implementation of the proposed future land use plan should remain flexible over the next two to three years in order to evaluate the potential for mission change at McConnell. During this interim period it is recommended that the LUCG standards be applied to proposed development within the 1994 Noise Contour Area. This could be accomplished by imposing the Protective Overlay (P-O) zoning regulations in the Wichita-Sedgwick County zoning code and using the LUCGs as a basis for reviewing development proposals within this area. Application of the LUCG standards would regulate the types of uses in specific areas related to noise level intensities, and also require that noise mitigation techniques be incorporated into the construction of buildings, as outlined in Section 2.3 of this chapter, which also contains additional regulatory measures for reducing or mitigating land use conflicts.

2) **Purchase Noise-Sensitive Areas** – As an alternative to regulatory methods for preserving land within the maximum mission noise contours, fee-simple purchase of noise-impacted land is the most permanent form of land-use control that could be considered. This approach is usually the most expensive. However, when combined with either resale for compatible uses or retention and use for a compatible purpose, the net cost may be reduced greatly. As a preventive measure, purchases should usually be limited to critical locations or in cases for which other solutions would not work. Possible funding sources for purchase of land in encroachment areas are discussed in Section 2.3 of this report. If a property acquisition program were to be established for McConnell, it should set a hierarchy of priorities for most critical areas related to Base operations as follows: APZ-I and APZ-II; 80dB and higher noise contour; 75-79dB noise contour; 70-74dB noise contour; and 65-69dB noise contour.

Positive Features - An obvious positive feature of this method is that it allows the community and military installation to gain complete control over the use of surrounding land. Ownership also allows eventual sale of property. This type of program also reduces initial expenditures by allowing the property to be acquired over time.

Negative Features - The biggest problem with this method is the cost of acquiring the land. The initial outlay may prove too expensive to justify the acquisition. It could also potentially remove a considerable amount of land from taxable property status to tax exempt.

3) **Acquire Easements for Noise-Sensitive Areas** – As an alternative to fee-simple acquisition of land the acquisition of easements could be applied to all or portions of the undeveloped land within the 1994 Noise Contour Area. Easements can be an effective and permanent form of land-use control. In many instances, this approach may be better than zoning for dealing with the installation's compatibility issues. Easements are permanent; with the title held by the purchaser until sold or released, and work equally well within different jurisdictions. They are legally enforceable and typically acquired for a portion of the cost of the fee-simple land value. Another consideration is that the land can be made available for full development with noise-compatible uses under the terms of the easement.

   There are two basic classes of easements – positive and negative. In positive easements, the right to do something with the property (e.g., build a road, install power line, or create high levels of noise over the property) is acquired. In negative easements, the rights to prevent the use of the property by its owner for certain activities is acquired. For noise compatibility issues, both the positive easement to make noise over the land and the negative easement to prevent the creation of an unprotected noise-sensitive use on the property may need to be acquired to ensure adequate control. The easement should give its owner the right to make noise over the property. It should also include purchase of all the property owner's rights to establish or maintain an unprotected noise-sensitive use on the property.

   Positive Features - Easement purchases are relatively straightforward transactions and are almost always less expensive than fee-simple purchases. They allow the community or installation to retain control over land without the burden of actual ownership. They are also usable in cases for which development already surrounds the installation.

   Negative Features - There may be difficulty in obtaining the necessary easements, particularly when many landowners are involved, because their cooperation is required. Unless otherwise specified, the rights are not automatically transferred upon a resale of the land, so further negotiations may be required.

4) **Transfer of Development Rights (TDR)** - The TDR concept involves transferring some of the property's developmental rights to another location where they may be used to intensify allowable development. With TDR, for example, lands within an installation's noise-impacted area could be kept in open space or agricultural uses and their developmental rights for residential uses transferred to locations outside the area. Landowners could be compensated for the transferred rights by their sale at the new location or the rights could be purchased by another organization. Depending on market conditions and/or legal requirements, the community or another organization could either hold or resell the rights. The TDR approach must be fully coordinated with the community's planning and zoning activities. It will also be necessary for the zoning ordinance to be amended so that it permits TDRs.

Positive Features - The program would be inexpensive or cost-free to the military installation since the local government would administer it. The program could also stimulate growth and development of the property to which development rights were being transferred.

Negative Features - One potential problem is record keeping. Because of the complexity of the transaction, it is often difficult to keep track of the principals and the exact number of rights that are sold and bought.

5) **Land Banking** - The term "land banking" is defined as a system in which an entity, such as the local governing body, acquires a substantial amount of land available for future development within a given region for the purpose of implementing a public land use policy. Land banking prohibits the land being acquired from becoming committed to a specific use at the time of acquisition; in addition, the land must be large enough to have a substantial affect on urban growth patterns. Land banking differs from permanent acquisition in that it places the land in a temporary holding status to be turned over for development at a future date. Land banking could be appropriate in the case of McConnell for purchasing undeveloped land within the 1994 noise contours until there is more certainty regarding the maximum mission status of the facility.

Positive Features - The two primary arguments in favor of land banking are that it will have an anti-inflationary affect on land prices, thus preventing land speculation, and it will permit more rational patterns of development rather than urban sprawl.

Negative Features - Positive aspects of land banking are disputed on the basis that if there is an orderly development of land, there will be no land that is "wasted". Therefore, the functional use of each parcel of land will increase, thus raising the price of that parcel. Another factor to consider is that the program may become politically manipulated. Government officials in charge of the program could show favoritism both when lands are acquired and opened for sale on the market. In addition, the expenditure required may be too large to even begin a program of land banking. Proponents claim, however, that the money can be recovered once the site is developed.

6) **Public/Private Leaseback** - Leaseback is a financial arrangement in which the land is acquired and controlled, but not necessarily occupied, by the owner. The leaseback arrangement typically involves a two-step process. First, real estate is purchased by either a private firm or government entity. Second, the property is leased by the purchaser to a new tenant for specific uses in accordance with the approved plan for the area. This approach could be used within the 1994 noise contour area to acquire critical land areas and lease them for the development of compatible land uses.

Positive Features - Leaseback offers a way for public agencies to acquire land, yet provide for the continued use of the land by others. Public agencies can thus limit the land use, while acquiring some income from the property. The leaseback method is popular in the private sector because it provides capital from outside sources and is a flexible form of financing.

Negative Features - Public agencies often have the usual landlord's management problems. The leaseback arrangement also keeps land off the tax roles when acquired by the public sector, which lowers income to the government. Problems arise in the private sector when there is no repurchase option and the value of the property appreciates. Without this option, the lessee will not share in any value increases.

2.3 Additional Legislative and Regulatory Methods for Supporting JLUS Recommendations

This section provides an overview of several additional federal and state legislative programs that could potentially be used to either fund recommended land acquisition programs or provide statutory support at the state and local levels for minimizing future land use conflicts around McConnell. Also presented is a generalized description of building code standards that could be integrated into local building codes as a means to implement noise level reduction measures in order to reduce potential noise impacts related to existing and future missions of the Base.

1) Federal Funding of Land Acquisition

As part of the National Defense Authorization Act of 2003 (Public Law 107-314) Congress enacted a new statute entitled "Agreements to Limit Encroachments and Other Constraints on Military Training, Testing and Operations." (refer to Section 2811 under Subtitle B – Real Property and Facilities Administration located in the Appendix).

Under this legislation the Secretary of Defense, or a Secretary of a Military Department, can work with state and local governmental agencies or private conservation organizations to acquire property outside the boundaries of a military installation. The primary purpose of this initiative is the acquisition of property that could, if developed, limit current or anticipated future military training, testing or operations. In addition, the Department of Defense is authorized to participate in the costs of acquiring property. It should be emphasized, however, that this new statute does not authorize land acquisition for active military uses. Some communities are now beginning to take advantage of this new approach. For example, Tucson, Arizona approved a $10 million bond issue to assist with land acquisition at nearby Davis-Monthan AFB.

This legislation also permits DoD to work with private organizations, whose stated purpose is the conservation, restoration or preservation of land or natural resources. Land of environmental significance, that is subject to development that would result in encroachment on military operations, could be acquired with DoD financial support by a local land trust or national conservation organization. Fort Lewis in Washington is

currently exploring this type of approach to acquire and protect training lands with state agencies and several local conservation organizations.

2) State Action

In a study prepared by the National Governors' Association (NGA) (*State Strategies to Address Encroachment at Military Installations*, July 2004), it was noted that a number of states have taken a variety of actions to prevent encroachment in order to protect public safety and maintain jobs and economic activities associated with military facilities. Based on NGA's research, it was determined that states have adopted a number of approaches to address encroachment issues including:

- Drafting state legislation that requires compatible land use;
- Enacting local zoning, planning and noise requirements;
- Using existing statutory authority to designate land around military installations as areas of critical state concern;
- Acquiring property surrounding military installations; and
- Creating state military advisory boards

A number of states (Florida, Georgia, Kentucky, North Carolina, Virginia and Washington) have enacted legislation during the past two years requiring that municipal and regional plans address the compatibility of land uses adjacent to military bases with the mission of the installation. Many of these new statutes also permit the commander of the installation to review and offer recommendations on proposed changes in existing land use plans and regulations that could impact the operation of the military facility.

The Governor of Kansas established a Strategic Military Planning Commission in February 2004. In addition, HB 2019 was introduced in the state legislature in December 2004. The bill is entitled "An Act concerning cities and counties; concerning encroachment restriction districts." Under this bill, cities or counties could create, enlarge or dissolve encroachment restriction districts at the request of property owners. An application for an encroachment district would include information relating to the specific encroachment restrictions "…such as light, noise, height and distance requirements…" and the reason for the encroachment restrictions. In addition, the application would also include "…a description of the impact of the applicant's operation on property not owned or possessed by the applicant including noise and noise levels at specific distances and the frequency of such noises." This information would then be available to any person seeking to develop or make property improvements and would serve as an affirmative defense to any nuisance claim arising from the activity. This bill was not enacted by the Kansas Legislature during its initial consideration of the proposal.

3) Building Codes and Noise Mitigation Plan

A building code prescribes the basic requirements that regulate construction of structures. The building code is adopted by the local governing body to protect the health, safety, and general welfare of the occupants of these structures. The code

establishes a set of requirements covering matters such as fire protection, building materials, lights, ventilation, exits, plumbing, and other related activities. Although building codes are not a technique to actually prevent development, they can restrict it, especially near military installations. A code could require that walls, partitions, and floor-ceiling construction have minimum sound transmission capabilities. The code could specify a certain sound transmission class (STC) that must be obtained. Specific construction techniques and materials can be stated in the code. In addition, the code should require that certain noise level reductions are maintained after the structure is complete.

The following information summarizes components that could be included in building codes or a typical sound insulation project. It should be noted that this would require a more detailed study regarding whether the implementation of such a program would be feasible and reasonable, how the program would be managed, as well as funding options and responsibilities. Typical acoustical treatments would include:

- Windows – Acoustically treated windows are available that meet criteria for noise level reduction. They are double-paned windows with a "cushion" of air between the panes of glass that is normally as wide as 3 inches. The air provides the noise level reduction or insulation that aids in the noise level reduction.
- Insulation – Additional insulation that covers pull-down attic stairs, attic spaces or panels
- Storm windows and doors – Where appropriate, exterior storm doors or windows in addition to primary doors or windows
- Fireplace doors – Additional fitting of glass doors over a fireplace
- Baffled gable vents and turbines
- Weather stripping – Additional weather-stripping to doors, garage doors and interior doors (i.e. from garages)
- Ventilation System – Central heat and air conditioning provide superior noise level reduction over window ventilation units

Municipalities must follow certain guidelines when considering an acoustical treatment program under Federal Aviation Administration (FAA) programs relating to civilian airports. Without an approved FAR Part 150 Noise Compatibility Study that recommends sound insulation as a mitigation measure, federal funding for such a project will likely not be available. Two categories of noise-sensitive land uses are not eligible for funding under FAR Part 150: 1) homes constructed after October 1, 1998; and, 2) homes impacted by military aircraft operations from a military base. Additionally, municipalities should be cautious about the public perception that some communities would be treated differently than others, should a noise insulation program be implemented for only certain communities. For example, if the City of Wichita were to implement a noise mitigation measure such as requiring sound insulation for new residential construction around McConnell Air Force Base, residents in close proximity to Wichita Mid-Continent who are impacted by noise from aircraft

overflights may interpret the city's participation in only one community as favoring one population over another. Typically, cities would adopt community-wide measures.

When considering a program for acoustical treatment, the philosophy of "the chain is only as strong as the weakest link" is appropriate to follow. For example, if a homeowner agrees to install only acoustically treated windows, but prefers decorative entry doors, sliding glass doors and window air conditioning units, a noise level reduction would not be achieved that meets the program's noise level reduction initiatives or homeowner satisfaction goals. Noise level reduction and compliance with performance specifications are key to an effective acoustical treatment, since every dwelling unit is unique.

At the initiation of acoustical treatment to a residential unit or other incompatible land use, the unit would undergo a pre-modification noise test. Noise, comparable to the level that is typically experienced at the dwelling, is created and noise-measuring equipment is placed inside the home to measure the loudness. This quantifies how effective the current dwelling is with regard to reducing noise. The same test would be conducted after the improvements are made, to evaluate the noise level reduction that is provided by the additional acoustical treatments. Typical acoustical treatments would include similar measures as described for inclusion under a building code.

The cost to complete such improvements factors in many variables. Some of them include the following.

- noise level impact
- number of improvements to be made (i.e. the number of windows, can vary significantly, whether central ventilation is installed, etc.)
- general type of construction such as peaked roofs vs. low pitch ranch style homes
- overall construction costs in a particular region
- number of residential units to be included in a project

Given the many variables, the costs of sound insulation projects can range between $20,000 and $30,000[5] per unit for existing single family houses. This cost does not include separate fees for administration of the project, management of the contractors and homeowner coordination. It would likely be more challenging for the City of Wichita to implement such a sound insulation project in the established residential development north of McConnell because the City would have to consider candidate areas around all of the airports and not just McConnell.

Positive Features - The positive feature of the building code is that it promotes construction and development of structures that contain noise-proofing features.

[5] Rough order-of-magnitude estimate; base on year 2000 improvements completed for five homes in San Antonio, Texas.

Negative Features - The negative feature of building codes is that they do not prevent or restrict any type of land use around installations.

4) Capital Improvement Program (CIP)

Capital improvements programming is the multi-year scheduling of physical upgrades to public property. A capital improvements program (CIP) is a planning tool used by local jurisdictions to phase-in the installation of needed public facilities (e.g., water and sewer, roads, schools) on a priority basis. A CIP usually estimates needs three to six years into the future and specifies what public improvements will be constructed. Scheduling is based on studies of fiscal resources available and improvements needed. Many communities are starting growth management systems, of which a CIP is an important component. The CIP identifies the methods by which improvements will be financed and the source of the funds. Usually, development occurs where capital improvements are located. Extension of municipal services into a particular portion of a community increases the attractiveness of an area to developers (i.e., the developer saves both time and money and density is usually greater). Local governments should avoid extending capital improvements into high-noise areas to avoid the possibility of incompatible uses.

Positive Features - There are many benefits to an effective CIP. For example, the CIP can ensure that plans for community facilities are completed; effectively schedule public improvements that require more than one year to construct; avoid improvement mismanagement; and lead to effective growth management, among other features. CIP can and should be coordinated with local zoning ordinances to provide for growth management.

Negative Features - Capital improvements are limited to expenditures for physical facilities with relatively long-term usefulness and permanence. Often, misuse of a CIP can lead to haphazard or unwanted development.

5) Special Tax Treatment

Special or preferential tax assessment of land by a local government allows an owner of a piece of property to pay lower or no property tax. By taxing land around a military installation differently, open space can be maintained. There are three primary methods of using taxes to keep space open. First, tax exemption of open property could be encouraged. Second, preferential assessment of land would allow agricultural or open land to be taxed at a substantially lower rate. Third, tax-deferral allows the owner of open property to forego property tax payments until a non-open space use is developed. Before such use is approved, however, all tax deferrals would have to be paid. The State of Kansas currently has a statewide right-to-farm law and differential tax assessment rates for agricultural land, while local governments have the authority to protect farmland from being developed through agricultural protection zoning.

Positive Features - These methods are, again, a way of preventing development at no cost to the military. The preservation of existing uses, especially agriculture, is promoted as well. Property that abuts the open space will become more valuable

through the amenity that open space provides. The added value translates into increased tax revenue for the local government. Because the open space is adjacent to a military installation, the value of the amenity is somewhat diminished, however. Even if the value of the abutting land use stays constant, the tax program has worked.

Negative Features - The cost of the program must be absorbed by the local government, which may refuse to implement it for this reason.

CHAPTER III
BASELINE CONDITIONS AND TRENDS

This chapter presents an overview of population changes that have occurred over the last decade within the Joint Land Use Study Area (JLUSA) as well as the three AICUZ areas being evaluated as part of this study[6]. The analysis of population change within these areas relies primarily on U.S. Census data from the 1990 and 2000 decennial census', as well as information presented in the Wichita-Sedgwick County Comprehensive Plan updates through 2003, prepared by the Metropolitan Area Planning Department (MAPD)[7]. For comparison purposes, population change and growth rates for the county as a whole, as well as the Cities of Wichita and Derby, are also presented (refer to Figure 1 for an illustration of the study areas and municipal boundaries).

1. JOINT LAND USE STUDY AREA AND AICUZ AREAS

Table 4 summarizes the population growth that occurred within the JLUSA, Wichita, Derby and Sedgwick County between 1990 and 2000. As illustrated, the study area's population increased by an estimated 4,153, or 12.5% over the decade.[8] This rate of growth is generally commensurate with that of the county (12.2%) and the City of Wichita (13.2%) during that time period. However, the City of Derby grew at a considerably faster rate of 21.1% over the decade adding approximately 3,100 residents.

More recent changes in population, which occurred between 2000 and 2004, are presented in the second part of Table 4. The change in population over the last four years was estimated based on building permits issued and the number of dwelling units constructed during this time period. Based on these estimates, the average annual rate of growth has remained steady in the JLUSA, as well as in the City of Wichita and Sedgwick County, although it has slowed slightly in comparison to the previous decade. However, Derby's average annual growth rate has increased by almost one half percent suggesting that this municipality is still experiencing a continuation of the steady growth that occurred during the previous decade.

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[6] In addition to the JLUSA, the three other study areas include the 1994 noise contour area, the 2004 noise contour area, and the Clear Zones/Accident Potential Zones at either end of the runway.

[7] *The Wichita-Sedgwick County Comprehensive Plan, Preparing for Change,* 1999 Update, and *Wichita-Sedgwick County Development Trends Report,* 2004, Prepared by the Metropolitan Area Planning Department.

[8] The study area's population was estimated based on population counts provided by the U.S. Census Bureau at the block level, the most detailed level of geography available. If only a portion of the census block was located within the JLUSA boundary, or an AICUZ area, the population estimate for that block was adjusted proportionately based on the amount of land area contained within the area.

Table 4
Population Change 1990 – 2030
JLUSA, Cities of Wichita and Derby, and Sedgwick County

Population Change 1990 - 2000					
	1990	**2000**	**Change 90-00**	**% Change**	**Avg. Annual Rate**
JLUSA*	33,159	37,312	4,153	12.5%	1.19%
Wichita	304,011	344,248	40,237	13.2%	1.25%
Derby	14,699	17,807	3,108	21.1%	1.94%
Sedgwick Cnty	403,662	452,869	49,207	12.2%	1.16%
Estimated Population Change 2000 – 2004**					
	2000	**2004 Est.**	**Change 00-04**	**% Change**	**Avg. Annual Rate**
JLUSA*	37,312	38,786	1,474	4.0%	0.97%
Wichita	344,248	360,715	16,467	4.8%	1.17%
Derby	17,807	19,646	1,839	10.3%	2.49%
Sedgwick Cnty	452,869	471,360	18,491	4.1%	1.01%
Projected Population Change 2000 – 2030					
	2000	**2030 Proj.**	**Change 00-30**	**% Change**	**Avg. Annual Rate**
JLUSA*	37,312	45,509	8,197	22.0%	0.66%
Wichita	344,248	412,762	68,514	19.9%	0.61%
Derby	17,807	31,144	13,337	74.9%	1.88%
Sedgwick Cnty	452,869	567,033	114,164	25.2%	0.75%

*Population estimates do not include people residing on McConnell AFB
** JLUSA estimates are as of June 2004. Estimates for the remaining areas are as of January 2004.
Source: US Census and Wichita-Sedgwick County MAPD.

Observations presented in the most recent Comprehensive Plan update noted that Wichita's historical growth has occurred primarily in the far west, east, and northeast portions of the city through the annexation of county land. The plan also indicates that this predominantly east-west growth pattern is expected to continue at least for the near future through 2010. Based on this conclusion, it is expected that the JLUSA will absorb a portion of this projected growth in the area located northeast of McConnell AFB (between Rock Road and Greenwich Road), as land is annexed adjacent to the current urban boundary of Wichita. This anticipated growth of Wichita's urban area, combined with the expectation of continued rapid growth in Derby, may have a strong influence on attracting additional development to areas east and south of the Base that are presently located in unincorporated portions of the county.

The population projections presented in Table 4 indicate that Derby's rapid growth is expected to continue for a sustained period, albeit at a slower rate than that which occurred over the last decade. These projections were developed by the MAPD as part of their comprehensive plan update efforts as well as the traffic modeling that has been developed for the county. Projections for areas within the JLUSA were derived from the geographic information system (GIS) Traffic Analysis Zones (TAZ) data layer prepared by the MAPD, for the TAZs that correspond to the boundaries of the study area. As the data shows, Derby's population is projected to increase by approximately 75% over the next 30 years with the addition of over 13,300 residents. In comparison, the JLUSA's population is projected to increase by a rate of only 22% during this time period, with the addition of approximately 8,200 people. The current Small City Growth Area boundaries, which are illustrated in Figure 8, indicate that a portion of Derby's future expansion area will occur on land

contained within the JLUSA, which may in turn, result in higher than anticipated growth levels within the study area in the vicinity of the Base.

The change in population between 1990 and 2000 within the two noise contour areas, as well as the APZ areas is presented in Table 5. There was no resident population located in the clear zone areas for either time period examined. These population figures have been estimated based on U.S. Census Block data for blocks that most closely corresponded to the area of analysis being evaluated.[9] For comparison purposes, the population change in the JLUSA has also been included in the table. The population data for these analysis areas does not include people residing in Base-related housing. However, the table does illustrate that the population associated with the facility declined by an estimated 476 people between 1990 and 2000.

The 1994 Noise Contour area is the largest of the AICUZ analysis areas, containing 17,777 acres or approximately 28 square miles. The population in this area increased by approximately 2,000 people between 1990 and 2000, representing a growth rate of 5% or about one half percent per year. This is less than half the rate of growth that occurred within the JLUSA where population increased by 12.5% or 1.19% annually over that ten-year

Table 5
Population Change 1990 - 2000
AICUZ Areas and JLUSA

	1994 Noise Contours**	2004 Noise Contours**	APZ*** Areas	Study Area
Total Estimated Population*				
1990	39,924	1,697	4,410	33,159
2000	41,923	1,698	4,643	37,312
Change	1,999	1	233	4,153
% Change	5.0%	0.1%	5.3%	12.5%
Avg. Annual	0.49%	0.01%	0.52%	1.19%
Land Area				
Sq. Miles	28.4	3.9	3.4	30.9
Acres	17,777	2,515	2,093	19,321
Population Density				
		1990		
Persons/Sq Mi	1,405.8	435.1	1,297.1	1,073.1
Persons/Acre	2.2	0.7	2.1	1.7
		2000		
Persons/Sq Mi	1,476.2	435.4	1,365.6	1,207.5
Persons/Acre	2.4	0.7	2.2	1.9
McConnell AFB Population				
1990	3,057			
2000	2,581			
Change	(476)			
% Change	-15.6%			

* Population estimates do not include people residing in AFB housing
** Represents the estimated number of people with noise exposure of 65 dB or greater
*** There is no resident population within the clear zones
Source: US Census

[9] Ibid

period. This indicates that the majority of the growth that has occurred around the Base over the last decade has been located outside the 1994 contour areas. The population density within these contours increased slightly from 2.2 persons per acre in 1990 to 2.4 persons in 2000. The number of people per square mile increased by approximately 70 during that time.

Population change within the 2004 Noise Contour area presents a considerably different scenario. According to estimates derived from the census block data there was essentially no change in the population in this area between 1990 and 2000. This conclusion is supported by the analysis of land use presented later in this report that found no new housing units constructed within this contour area after 1991. This noise contour area has an estimated population density of less than one person per acre.

In the APZ areas, census data indicates that population increased by approximately 233 people between 1990 and 2000, a growth rate of 5.3%. All of this increase is estimated to have occurred in APZ-II located south of the Base. With a size of approximately 2,100 acres the APZ areas had a population density of 1.8 persons per acre in 2000 which had increased only slightly from 1.7 persons per acre in 1990.

2. ANALYSIS OF EXISTING LAND USES

2.1 Methodology for Data Collection and Analysis

The primary source relied on for identifying and evaluating existing land uses was the real property database obtained from the Sedgwick County Appraiser's Office. This database contains a property record for every parcel of land in the county and a variety of attributes including the type of land use, parcel size, building size, year built of structure, and many other variables. This database is linked to a digital parcel map that forms the basis for the county's geographic information system (GIS).

The land use information contained in the county's database divides land use types into over 200 specific uses. Since that level of detail was not necessary for this analysis, these land use codes were collapsed into eight or nine more generalized land use categories that were appropriate for evaluating potential conflicts with Base operations. Use of the GIS allowed for all four of the study area boundaries to be overlaid onto the land use map, as well as other features of the study areas that were examined. This land use database and GIS, which was current through June 2004, was ultimately used to calculate land use acreages and create the various maps presented throughout this report. Where a question may have arisen with regard to the accuracy of particular parcels in the land use database, recent aerial photography was used to corroborate the information. It is possible that recent land use changes may not be reflected in this report, but every effort was made to use the best available information in order to present an accurate assessment of existing conditions.

Since some of the study area boundaries are irregularly shaped (e.g. the noise contour areas) it would have been somewhat problematic to estimate land use acreage for parcels that fell within two or more noise contour intervals. In these cases, the parcel land use map was converted into a grid format, with cells approximately one-quarter acre in size, that allowed for calculations to be completed within these irregularly shaped areas. While this approach does result in a slight loss of detail in the information, the grid size used was

considered to be of suitable area to evaluate land use characteristics given the size of the study areas.

Throughout the land use analysis, as well as other sections of this report, reference is made to the Land Use Compatibility Guidelines (LUCG). These guidelines, which are the same as those used in the 2004 AICUZ study, are based on those published by the Federal Interagency Committee on Urban Noise in 1980. The LUCGs provide recommendations for which land uses are appropriate in various AICUZ locations based on the types of structures and estimated densities of people. A summary table of these LUCGs is located in the Appendix.

2.2 Existing Land Use – Joint Land Use Study Area

The Joint Land Use Study Area (JLUSA) is the largest of the four areas analyzed for this study containing slightly over 22,000 acres and approximately 14,160 land parcels, based on the county's real property records. Table 6 presents the acreage contained in the JLUSA based on generalized land use categories, which are also illustrated in Figure 4.

Table 6
Existing Land Use Acreage for Joint Land Use Study Area – 2004

	Developed			
Land Use	**Acreage**	**% Total**	**# Parcels**	**% Total**
Residential	3,958	18.0%	11,282	79.7%
Commercial	658	3.0%	431	3.0%
Industrial	1,634	7.4%	63	0.4%
TCPU	85	0.4%	24	0.2%
Institutional	382	1.7%	86	0.6%
Recreation	164	0.7%	11	0.1%
AFB/Federal*	2,721	12.3%	59	0.4%
Subtotal	9,603	43.6%	11,956	84.4%
	Potentially Developable			
	Acreage	**% Total**	**# Parcels**	**% Total**
Agricultural	9,158	41.5%	1,424	10.1%
Undeveloped	882	4.0%	727	5.1%
Subtotal	10,041	45.6%	2,151	15.2%
Total Parcel Area	19,644	89.1%	14,107	99.6%
ROW/Other**	2,398	10.9%	52	NA
Total Land Area	22,042	100.0%	14,159	100.0%

* Includes land that is part of McConnell AFB and/or other Federally owned land
** Includes road rights-of-way, river/stream corridors, and other unclassified parcels
TCPU = Transportation, Communication, Public Utilities
Source: Sedgwick County Appraiser's records 2004 and RKG Associates, Inc.

As the data indicates, an estimated 9,600 acres, or approximately 44% of the total land contained in the study area can be generally classified as "developed." In this instance, the term "developed" includes land uses such as residential subdivisions and apartment complexes, industrial facilities, business establishments, or government and institutional uses that are likely to have a significant structural development associated with those uses. There may be potential for additional infill development on these previously developed

parcels; however, for the purpose of this analysis these properties are assumed to be essentially built out based on current zoning.

The existing development patterns within the study area are strongly influenced by growth in the Cities of Wichita and Derby, their current zoning regulations, and the availability of municipal water and sewer systems. The last item, availability of municipal water and sewer, is perhaps the most significant factor since access to these systems permits development at much higher densities. The study area is also well served by a roadway system of Interstate highways, state highways, and surface roads that provide good internal circulation as well as access to other regions.

North of the Base, land within the City of Wichita is predominantly high density residential development. A significant amount of commercial retail and service development is concentrated along several major arteries, while a modest amount of supporting institutional and recreational uses are disbursed throughout the area. Residential development represents the largest amount of developed land within the study area with approximately 3,960 acres, or 18% of the total land area.

Industrial land uses represent the second largest use of land in the study area totaling approximately 1,600 acres, which is primarily concentrated along the northern and western boundaries of the Base. This development lies in Sedgwick County but receives water and sewer service from Wichita. West of the Base this industrial development is comprised of large, high density manufacturing facilities operated by the Boeing Corporation. The industrial development north of the Base, which is operated by the Cessna Corporation, is at considerably lower densities. Cessna also operates a small airstrip in this area for testing equipment.

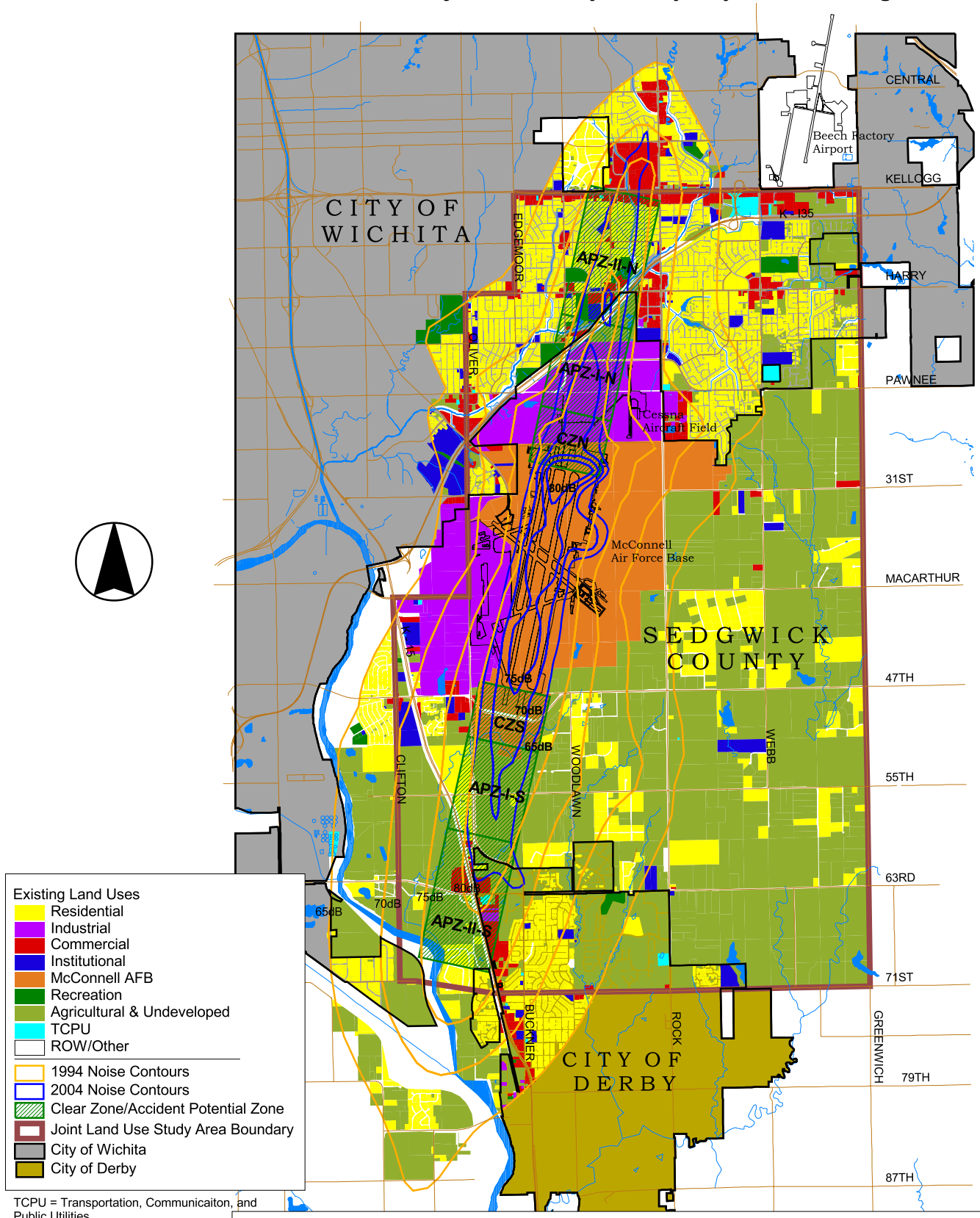
As illustrated in Figure 4, existing land use in the unincorporated portions of Sedgwick County is comprised predominantly of agricultural activities and low density residential housing. One exception to this pattern is found west of the Base along Clifton Avenue in the Oaklawn/Sunview Improvement District where several high density subdivisions and a school exist. This improvement district, which receives water and sewer service from the City of Wichita, is discussed in more detail in Chapter IV dealing with future land uses. Agricultural land in the study area totals 9,158 acres, or 42% of the total land area. This is the single largest use of land in the study area and represents a considerable supply of potentially developable land for future growth. There is an additional 882 acres of land in the study area that is classified as undeveloped in the county's property records; however, a portion of this acreage is land set aside as open space within residential developments and therefore, is not actually developable.

Existing land use within the city limits of Derby is predominantly high density residential development. Although a portion of this land area is classified as agricultural in Figure 4, these properties have already been platted for a mixed-use development containing a golf course and over 600 units of housing. Although many of the single-family house lots remain undeveloped at this time, approximately 400 multi-family units have already been

Existing Land Use

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



Prepared by RKG Associates, Inc. - May 2005
Source: 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure 4

constructed. It is also important to note that some residential development has begun to occur to the north and west, just beyond the city boundary of Derby, north of 63rd Street, extending into the city's area of influence which is currently within the unincorporated portion of Sedgwick County. Aside from this residential development there is also a modest amount of commercial and industrial development within the city's municipal boundaries located along Southeast Boulevard, which includes a recently constructed Lowe's retail home improvement center.

2.3 Existing Land Use - 1994 Noise Contour Areas

A summary of the estimated acreage of existing land uses located within the 1994 noise contour boundaries is presented in Table 7. The estimated acreage figures are divided into four noise contour intervals ranging between DNL 65 dB and 80+ dB in order to illustrate the potential conflicts that may exist between various land uses as noise levels increase. The generalized existing land use patterns are also illustrated in Figure 4 in relation to the noise contour boundaries.

As noted in Table 7, the entire land area within the 1994 noise contours encompasses approximately 17,777 acres, of which 2,721 acres are located on the Base. Of the total acreage the largest single component is agricultural uses which comprise approximately 4,140 acres, or 23%, most of which lies in unincorporated portions of Sedgwick County. Agricultural activities are generally considered to be favorable land uses within these noise boundaries based on federal Land Use Compatibility Guidelines (LUCG), which are summarized in the Appendix (Table A-1). However, some of these agricultural operations also include a residential component (e.g. homesteads), albeit at lower densities, therefore the implementation of noise level reduction (NLR) measures is recommended.

Table 7
Generalized Existing Land Use Acreage for 1994 Noise Contour Intervals

	Noise Contour Intervals (dB)					
Land Use	**65-69**	**70-74**	**75-79**	**80+**	**Total**	**% Total**
Residential	2,232.3	961.9	498.9	37.2	3,730.3	21.0%
Commercial	250.2	275.7	208.0	42.2	776.2	4.4%
Industrial	335.4	657.7	542.0	320.0	1,855.1	10.4%
TCPU	12.4	6.2	0.7	5.3	24.6	0.1%
Institutional	218.8	103.1	27.3	3.4	352.6	2.0%
Recreation	107.2	64.3	35.4	1.8	208.7	1.2%
Agricultural	1,920.6	961.9	776.6	484.2	4,143.3	23.3%
Undeveloped	383.1	275.5	96.4	19.7	774.8	4.4%
AFB/Federal*	327.4	551.2	472.5	1,370.1	2,721.1	15.3%
Total Parcel Area	5,787.4	3,857.4	2,657.7	2,284.0	14,586.5	82.1%
ROW/Other**					3,190.5	17.9%
Total Land Area					17,777.0	100.0%

* Includes land that is part of McConnell AFB and/or other Federally owned land
** Includes road rights-of-way, river/stream corridors, and other unclassified parcels
TCPU = Transportation, Communication, Public Utilities
Source: Sedgwick County Appraiser's records 2004 and RKG Associates, Inc.

Although agricultural activities are generally considered to be compatible uses under the LUCGs, a caveat should be noted with regard to future growth potential. Agricultural land can be easily converted into residential and/or commercial uses since it has already been

cleared, leveled and drained. Therefore, the 4,140 acres of agricultural land within the 1994 noise contour areas has the potential to support a considerable amount of growth, especially if water and sewer lines are extended into these areas.

Residential uses represent the second largest component of existing land use within the 1994 noise contour areas. As illustrated in Table 7, residential uses accounted for approximately 3,730 acres, or 21% of the total land area. The vast majority of this development is located north of the Base, and represents higher densities of housing units, since these areas are largely within the corporate boundaries of the City of Wichita with access to municipal water and sewer. A review of existing land uses illustrated in Figure 4 suggests that most of the land north of the Base, which is also contained within the 1994 noise contours, has been built out. However, there may still be the potential for further infill development that could not be determined as part of this analysis.

South of the Base, higher densities of residential uses are also concentrated within the municipal boundaries of the City of Derby where future development potential still exists. The remaining residential uses in the unincorporated portions of the county have generally occurred at lower densities of five acres or more per dwelling unit, given the lack of access to municipal water and sewer systems.

Residential uses within the DNL 65-69 dB are discouraged under the LUCGs and strongly discouraged in DNL 70-74 dB, as illustrated in the Appendix. However, if residential development is permitted in these areas it should be accompanied by the implementation of NLR measures, according to the LUCGs. There are approximately 3,190 acres of residential development located within these noise contours, as shown in Table 7. Residential uses within the DNL 75 dB or greater are considered incompatible based on land use compatibility guidelines even if NLR measures are implemented. Table 7 shows that approximately 535 acres of residential development presently exists within these two (75-80 and 80+) 1994 noise contour intervals.

Commercial and industrial uses account for a combined total of approximately 2,630 acres, or 15% of the area within the 1994 noise contours area. For the most part, both commercial and industrial uses are considered to be largely compatible with the LUCGs for all but the highest levels of noise exposure (i.e. DNL 80 dB or greater). Commercial and industrial uses established within the DNL 70-79 dB ranges are recommended to initiate NLR measures in the portions of buildings where the public is received, as well as office areas or noise sensitive areas, as noted in Appendix Table A-1. However, certain types of retail, service, and office commercial uses are not recommended in DNL 80 dB or greater. As illustrated in Table 7, there are approximately 42 acres of commercial uses that presently exist within this noise contour interval.

The three remaining categories of developed land uses within the noise contour areas include institutional, recreation, and TCPU (transportation, communication, and public utilities) that have a combined acreage of approximately 586 acres, or 3% of the total. Institutional and recreation uses are generally considered to be compatible land uses, although there are some exceptions, within DNLs 65-69 dB and 70-75 dB provided that

NLR measures are implemented. For higher noise exposure areas greater than 75 dB, institutional and recreation uses are generally considered incompatible. There are approximately 74 acres of existing institutional and recreation uses within these higher noise exposure areas, based on the 1994 noise contour intervals. TCPU land uses are all considered to be compatible uses, based on LUCGs, provided that NLR measures are implemented.

Land that is categorized as undeveloped in the county's appraisal records (other than agricultural land) constitutes approximately 775 acres, or 4%, of the area within the 1994 noise contour areas. However, a review of the land use map generated from this data reveals that a significant portion of the acreage has already been platted for residential uses (with access to municipal utilities) or represents land that is designated as permanent open space within residential subdivisions. Therefore, the majority of this acreage has in fact, already been "developed" although construction may not yet have occurred or been recorded in the property records.

2.4 Existing Land Use - 2004 Noise Contour Areas

The "footprint" of the 2004 noise contour areas is considerably smaller than the 1994 contour areas discussed above. The 2004 noise contours encompass an area that contains approximately 2,515 acres, which is only 14% of the acreage contained in the 1994 affected area. As illustrated in Table 8, the only existing land uses located in the two highest noise exposure areas (75-79 and 80+ dB) are those that are associated with McConnell AFB and therefore, do not represent potential conflicts with the Base's mission. Approximately half of the total acreage within the contour areas is located on the Base.

On land area that is not part of the Base, industrial uses represent the largest amount of development at 384 acres, or 15% of the total, all of which is located within noise exposure areas of less than DNL 75 dB. As discussed previously, industrial uses are generally considered compatible land uses at these noise levels, provided that NLR measures are

Table 8
Generalized Existing Land Use Acreage for 2004 Noise Contour Intervals

	Noise Contour Intervals (dB)					
Land Use	**65-69**	**70-74**	**75-79**	**80+**	**Total**	**% Total**
Residential	135.7	-	-	-	135.7	5.4%
Industrial	234.2	150.1	-	-	384.3	15.3%
Commercial	94.4	1.6	-	-	96.0	3.8%
Institutional	20.2	2.5	-	-	22.7	0.9%
Recreation	28.2	-	-	-	28.2	1.1%
Agricultural	347.1	40.4	-	-	387.5	15.4%
Undeveloped	6.2	1.1	-	-	7.3	0.3%
AFB/Federal*	369.1	503.2	321.6	71.9	1,265.8	50.3%
Total Parcel Area	1,235.1	699.0	321.6	71.9	2,327.6	92.5%
ROW/Other**					187.4	7.5%
Total Land Area					2,515.0	100.0%

* Includes land that is part of McConnell AFB and/or other Federally owned land
** Includes road rights-of-way, river/stream corridors, and other unclassified parcels
TCPU = Transportation, Communication, Public Utilities
Source: Sedgwick County Appraiser's records 2004 and RKG Associates, Inc.

implemented for portions of buildings containing public receiving areas and offices, as illustrated in the Appendix.

The remaining developed land area within the 2004 contour areas is located within the DNL 65-69 dB range, with the exception of a few acres. This developed land area totals approximately 279 acres, or 11% of the total area. Approximately half of this acreage is residential uses while the remainder is comprised of commercial, institutional, and recreational land uses. Based on the LUCGs, residential uses should be discouraged within this level of noise exposure, but all remaining development is generally characterized as compatible land uses although NLR measures are considered appropriate for some uses.

Agricultural uses represent the largest amount of acreage overall within the 2004 contours areas at approximately 388 acres, or 15% of the total land area. The majority of this acreage is located south of the Base although a lesser amount is also located north of the facility. As noted previously, agricultural activities are generally considered compatible within all four noise contour intervals, but NLR measures are recommended for associated residential structures.

2.5 Existing Land Use - Clear Zones and Accident Potential Zones

The remaining AICUZ areas for which existing land use was examined includes the Clear Zones (CZ) and the Accident Potential Zones (APZ). Unlike the noise contour areas discussed above, the boundaries of the CZs and APZs have remained unchanged for the two time periods (1994 and 2004) considered as part of this analysis. Table 9 presents a summary of existing land uses in theses zones that differentiates whether the acreage lies north or south of the Base runways.

Table 9
Generalized Existing Land Use Acreage for Clear Zones and Accident Potential Zones - 2004

	North of Runways			South of Runways				
Land Use	**CZN**	**APZ-I-N**	**APZ-II-N**	**CZS**	**APZ-I-S**	**APZ-II-S**	**Total**	**% Total**
Residential	-	9.9	250.5	-	69.6	52.1	382.0	14.6%
Industrial	138.2	296.4	0.7	0.2	-	11.9	447.4	17.1%
TCPU	-	-	1.8	-	-	6.0	7.8	0.3%
Commercial	-	7.3	65.4	1.1	-	80.6	154.5	5.9%
Institutional	-	0.9	28.2	-	-	-	29.2	1.1%
Recreation	-	11.5	53.7	-	-	-	65.2	2.5%
Agricultural	-	35.4	38.6	3.2	300.0	334.9	712.1	27.2%
Undeveloped	-	9.6	5.7	0.5	3.7	6.0	25.5	1.0%
AFB/Federal*	123.5	-	-	239.2	22.3	-	385.0	14.7%
Total Parcel Area	261.7	371.0	444.7	244.3	395.5	491.5	2,208.7	84.4%
ROW/Other**							409.3	15.6%
Total Land Area							2,618.0	100.0%

* Includes land that is part of McConnell AFB and/or other Federally owned land
** Includes road rights-of-way, river/stream corridors, and other unclassified parcels
TCPU = Transportation, Communication, Public Utilities
Source: Sedgwick County Appraiser's records 2004 and RKG Associates, Inc.

The total area contained within the CZs and APZs is approximately 2,618 acres, which includes 385 acres located on the Base. Non-Base related development in the CZ areas is predominantly industrially related land uses encompassing 138 acres located north of the

runways. Based on LUCGs, industrial activities are considered incompatible in these zones even though these parcels are used for aviation-related activities. South of the runways, just over an acre of commercial land is the only non-Base related development in the CZ that would be classified as an incompatible use. The three remaining acres of agricultural land in the southern CZ are considered to be an acceptable use in this area.

Of the two APZ-I areas the northern zone has considerably more developed land area than the southern zone, which is illustrated both in Table 9 and Figure 4. The northern zone has approximately 326 acres of developed land, 296 acres of which are classified as industrial, based on property records. However, it is estimated that only 25 acres of this industrial land contains manufacturing facilities, with the remaining acreage presently undeveloped. Generally speaking, LUCGs consider some industrial and commercial uses to be compatible within these zones if they are at sufficiently low densities. The same is true for institutional and recreational uses, although larger public gathering areas, such as schools, churches, or auditoriums, are considered to be incompatible in this zone. The 10 acres of residentially developed land in APZ-I-N and the 70 acres in APZ-I-S are considered incompatible uses based on LUCG standards. The 300+ acres of agriculturally developed land in the APZ-I areas are considered compatible uses provided that there are no related structures.

The APZ-II areas contain approximately 300 acres of residentially developed land. Although lower density single-family housing is considered compatible in these zones the existing housing, which has access to municipal water and sewer, is not of sufficiently low density to be considered acceptable, based on LUCG recommendations. It should be noted that additional residential lots exist in the southern APZ-II area, a fact which is not reflected in the 300 acre total due to the fact that houses have not yet been built on these lots. This development activity is located along the northern boundary of the Derby city limits along 63rd Street.

Commercial and industrial uses in the APZ-II areas total approximately 158 acres which is split relatively evenly between the northern and southern zones. From an overall perspective the LUCGs consider many commercial and industrial uses compatible within this zone; however, facilities accommodating higher densities of people, such as shopping malls, are not recommended for inclusion in these areas.

The same recommendations apply to institutional and recreational uses of which there are approximately 72 acres in the APZ-II-N area. Activities within these land use categories that do not involve the gathering of higher densities of individuals are considered acceptable. The remaining acreage in the APZ-II areas is comprised of agricultural uses encompassing approximately 373 acres, or 27% of the total. As in the other zones, agricultural activities are considered compatible land uses provided that no structures are involved.

3. CHANGES IN LAND USE

This section presents an overview of changes in land use development patterns that have occurred within the last decade. Two primary data sources have been examined to assess

changes in development that include subdivision activity and the number of structures built annually. Following the same approach that was used to describe existing land use patterns in the preceding section, the changes in development are examined for all four of the project study areas which include the JLUSA, 1994 noise contour areas, 2004 noise contour areas, and the clear zone/accident potential areas.

The data in this section is presented for three time periods which includes 1991 to 1995, 1996 to 2000, and 2001 to 2004 (through June). The primary concern of this analysis is the changes in development patterns that have occurred after 1995, which is the demarcation point for when the previous AICUZ study but was completed for McConnell AFB.

3.1 Land Use Changes - Joint Land Use Study Area

Subdivision activity within the JLUSA is presented in Table 10 and illustrated in Figure 5. As the data shows there have been 96 subdivisions approved since 1991 that involved approximately 2,250 acres. These subdivisions represent a combination of residential and non-residential development although the vast majority involves housing development in residential zoning districts.

Since 1995, 68 subdivisions on 1,775 acres of land have been approved within the study area which represents approximately 78% of the total subdivisions approved over the last 14 years. Although the number of subdivisions approved (24) between 2001 and 2004 has decreased in comparison to the 44 approved between 1996 and 2000, the total acreage subdivided over the last four years has increased. Therefore, while the number of subdivisions may have declined, the total number of parcels and/or dwelling units appears to have actually increased, based on the amount of land area involved.

Table 10
Subdivision Activity in the JLUSA 1991-2004*

Year Subdv.	# Subdv.	% Total	Total Acres	% Total
1991-1995	28	29.2%	475	21.1%
1996-2000	44	45.8%	821	36.5%
2001-2004*	24	25.0%	954	42.4%
Total	96	100.0%	2,250	100.0%

*Through June 2004
Source: Wichita-Sedgwick County MAPD

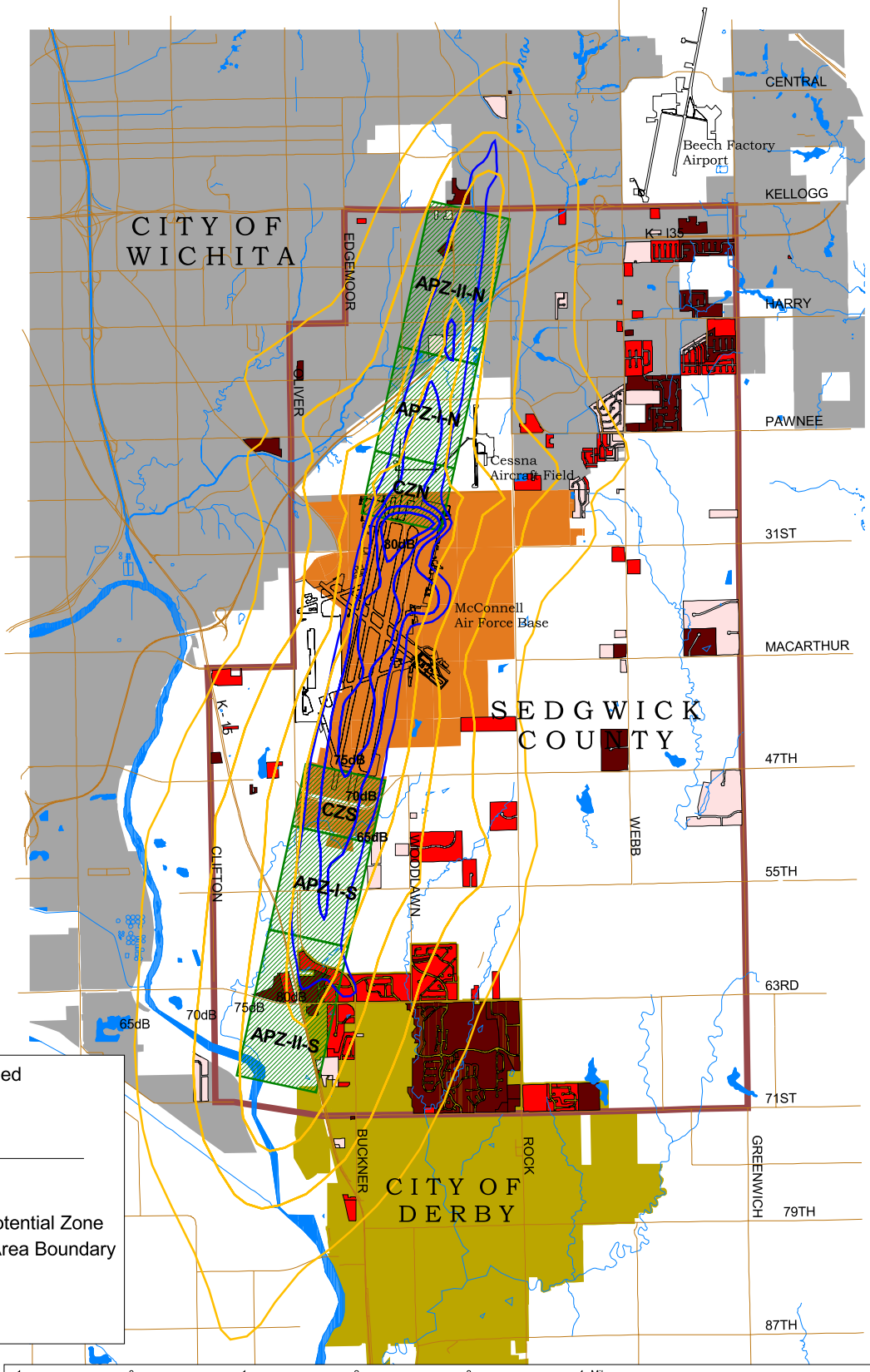
As illustrated in Figure 5, subdivision activity that has occurred since 1995 in the JLUSA is concentrated in three primary locations. These include the eastern edge of Wichita's city limits, areas within the City of Derby, and the unincorporated county area that lies between Derby and the southern edge of the Base. Recent subdivisions in this latter area have resulted in encroachment on land within the southern APZ area associated with Base operations.

Table 11 illustrates the existing number of residential dwelling units, by type of unit, for the JLUSA as well as the other analysis areas being evaluated for this study. The second half of the Table illustrates the number of units constructed in the study area since 1991 for the time intervals before and after 1995. The location of these dwelling units is depicted in Figure 6. According the county's real estate records an estimated 2,718 dwellings have been constructed over the last 14 years, over 80% of which were single-family dwellings. Approximately equal amounts of units were constructed before and after 1995. Between 1996 and 2000, 890 dwellings were constructed, representing an average of approximately

Subdivision Activity 1991-2004

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



Prepared by RKG Associates, Inc. - May 2005
Source: Wichita-Sedgwick MAPD; 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure 5

178 units per year. After 2000, 550 units were constructed in the 3½ year period between 2001 and June of 2004 which results in an average of approximately 157 units per year. Therefore, the trend represented by this data illustrates an overall decline in the rate of housing development in the study area that appears to have dropped to its slowest rate within the last four years.

Table 11
Residential Dwelling Units by Year Built* and Location – 2004*

Total Dwelling Units by Location

Location	SF	Duplex	3-4 Units	Condos	MH	Farmstds	Apts	Total
JLU Study Area	10,040	464	432	448	317	199	6,054	17,954
1994 Contours	11,136	526	474	384	601	82	5,013	18,216
2004 Contours	480	4	85	-	3	2	180	754
APZ Areas**	1,208	60	114	-	12	15	618	2,027

JLUSA Dwelling Units by Year Built

Year Built	SF	Duplex	3-4 Units	Condos	MH	Farmstds	Apts	Total	% Total
1991-1995	991	2	-	-	-	21	264	1,278	7.1%
1996-2000	868	2	-	-	-	20	-	890	5.0%
2001-2004*	542	-	-	-	-	8	-	550	3.1%
Total	2,401	4	-	-	-	49	264	2,718	15.1%

* Through June 2004
** No dwelling units are located within the clear zones
Source: Sedgwick County Appraisers Office

Along with housing construction trends, real estate sales data can also provide some insight concerning the development trends and market conditions that exist within the study area and its regional area of influence. Home sales and land sales tracked by the Sedgwick County Appraiser's Office were also examined for the years 1991 through 2004. The data is presented in Table 12 and illustrated in the accompanying graph. This data includes the sale prices of all housing types (e.g. single-family, duplex, condo, manufactured housing) with the exception of multi-family apartment buildings.

Table 12
Residential Real Estate Sales 1991 - 2004
JLUSA and Sedgwick County

Home Sales (Land and Building)

	JLUSA			Sedgwick County		
	# Sales	Avg. Price	% Change	# Sales	Avg. Price	% Change
1991-1995	3,030	$ 77,518	NA	14,440	$ 80,544	NA
1996-2000	3,628	$ 87,926	13.4%	18,674	$ 90,732	12.6%
2001-2004	2,874	$ 102,289	16.3%	14,200	$ 108,185	19.2%

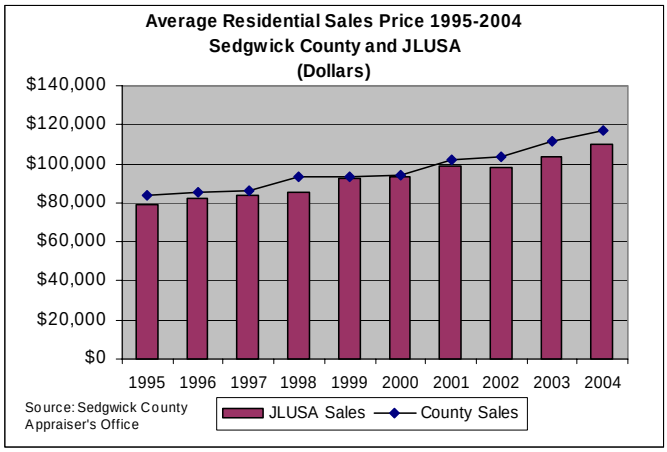
Residential Land Only

	JLUSA				Sedgwick County			
	# Sales	Total Acres	Med. Lot Size	Avg/Acre	# Sales	Total Acres	Med. Lot Size	Avg/Acre
1991-1995	37	417	4.99	$ 2,385	270	1,231	0.37	$ 5,853
1996-2000	53	543	4.74	$ 7,448	334	1,433	0.32	$ 8,403
2001-2004	36	192	2.97	$ 11,312	280	1,062	0.45	$ 16,051

Source: Sedgwick County Appraiser's Office and RKG Associates, Inc.

The five year period between 1996 and 2000 was the most active in terms of total sales for both the JLUSA (3,628) and the county (18,674), which represents annual sales of approximately 725 and 3,734 respectively. Although the total sales declined in the period between 2001 and 2004, the decline has been less pronounced in the JLUSA which has averaged 718 sales annually versus 3,550 for the county as a whole.

The average sales price of housing has remained consistently higher in the county versus the study area although the difference in price has not been substantial. Between 1991 and 2000 the difference in sales price was only approximately $3,000. However, over the last four years the difference in sales price has almost doubled resulting in an estimated $6,000 differential between homes in the county versus the JLUSA. A noteworthy comparison to the county's real estate sales data is provided in information gathered by the Wichita Area Association of Realtors' (WAAR) Multiple Listing Service (MLS). As of the end of 2003 the average sale price for an *existing home* in the WAAR region was $102,463, a figure almost identical to the average found in the JLUSA. However, the average sale price of a *new home* in the WAAR region at this time was approximately $173,000, a difference of almost $50,000. In fact, the average sale price of a new home in the WAAR region has increased from $103,967 in 2000 to $172,848 in 2003, a rate of appreciation approximately double the increase experienced within the JLUSA during this time period.



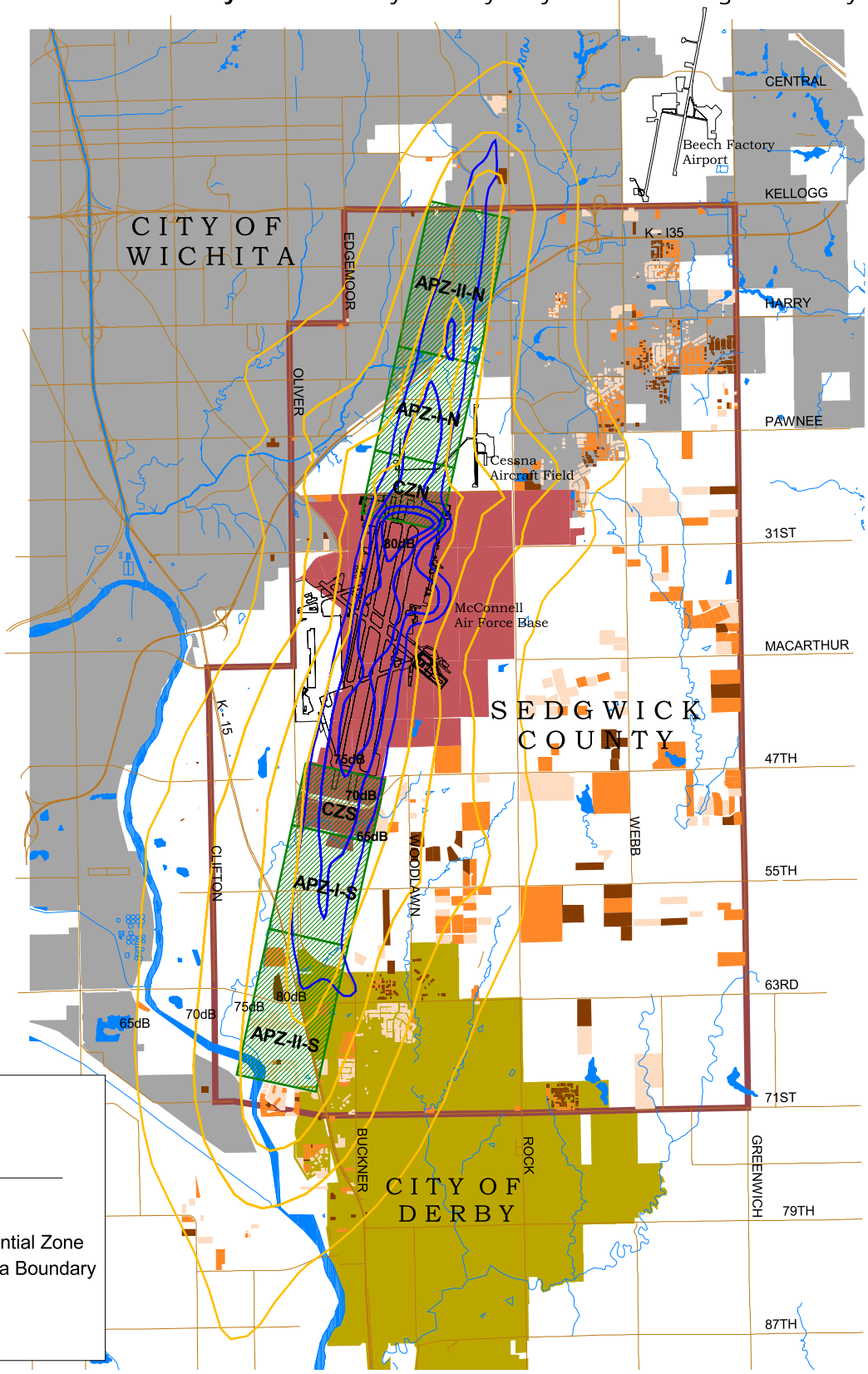
The WAAR also gathers MLS sales data for sub regions within the Sedgwick County area. The WAAR real estate region that encompasses the JLUSA is RE900 which includes Southeast Sedgwick County as well as the City of Derby. The average sale price of an existing home in this sub region as of 2003 was $115,873 with new homes selling for an average of $156,001. This indicates that housing in the study area is of somewhat lower value than housing in the remainder of this sub region, a condition that may be influenced by proximity to the Base but may also be related to other factors as well.

The number of land sales in the study area has been relatively moderate over the last 14 years with a total of only 126 arms length transactions, involving 1,152 acres, recorded by the County Appraiser's Office. In comparison, all of Sedgwick County had 632 sales totaling 3,726 acres. This suggests that the JLUSA encompassed 20% of the county's total land sales and approximately 31% of the land acreage that was transferred during the time period examined.

Housing Construction 1991-2004

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



Housing Units by Year Built
- 1991 - 1995
- 1996 - 2000
- 2001 - 2004

- 1994 Noise Contours
- 2004 Noise Contours
- Clear Zone/Accident Potential Zone
- Joint Land Use Study Area Boundary
- McConnell AFB
- City of Derby
- City of Wichita

1 0 1 2 3 4 Miles

Prepared by RKG Associates, Inc. - May 2005
Source: Sedgwick County Appraiser's Office; 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure 6

The average price per acre of residential land sold has risen significantly over the last 14 years in both the JLUSA and the county. In the JLUS area the average has risen by approximately $8,900 per acre, an increase of 374% while the county's average increased by approximately $10,200, or 174%. The county's average price per acre has remained consistently higher but as the smaller median lot size denotes, the majority of these sales appear to be full-service lots (with access to water and sewer) which would be expected to achieve a higher price.

3.2 Land Use Changes - 1994 and 2004 Noise Contour Areas

Subdivision activity that has occurred since 1991 within the 1994 and 2004 Noise Contour Areas is summarized in Table 13. Within the 1994 Contour Areas approximately 1,152 acres have been subdivided over the last 14 years which represents the development of 61 subdivisions (or portions of subdivisions that may be bisected by a noise contour line).

According to county records, a total of 948 acres have been subdivided since 1995 within the area affected by these noise contours although the rate has declined somewhat within the last four years. The majority of this subdivision activity has occurred within and adjacent to the City of Derby, particularly between 63rd and 47th Streets, which is the area that lies between Derby and the Base, as illustrated in Figure 5. A more modest amount of activity can also be observed along the southeastern fringe of Wichita's city limits between Rock Road and Webb Road with smaller pockets scattered within the northern reaches of the contour limits.

Table 13
Subdivision Activity in the 1994 and 2004 Noise Contour Areas

	Acreage Subdivided by 1994 Noise Contour Intervals (dB)					
Year Subd.	**65-69**	**70-74**	**75-79**	**80+**	**Total**	**% Total**
1991-1995	80	39	64	22	204	18%
1996-2000	229	203	132	30	594	52%
2001-2004*	265	28	23	38	354	31%
Total	573	270	219	90	1,152	100%

	Acreage Subdivided by 2004 Noise Contour Intervals (dB)					
Year Subd.	**65-69**	**70-74**	**75-79**	**80+**	**Total**	**% Total**
1991-1995	16	2	-	-	18	25%
1996-2000	34	-	-	-	34	49%
2001-2004*	18	-	-	-	18	26%
Total	68	2	-	-	70	100%

*Through June 2004
Source: Wichita-Sedgwick County MAPD and RKG Associates, Inc.

Areas of concern involve the development that has occurred within noise exposure areas greater than 75 dB where after 1995, approximately 223 acres have been developed. Based on the LUCGs, residential development is not recommended within these areas and commercial uses are only recommended at the lower range (75-79dB) if NLR measures are implemented.

The second part of Table 13 presents the acreage of land that has been subdivided within the 2004 Noise Contour Areas since 1991. A total of only 70 acres has been subdivided within this area which includes portions of six subdivisions. All but two acres of these developments are located within the DNL 65-69 dB where residential development is discouraged but should have NLR measures implemented if it is permitted, according to the LUCGs outlined in the Appendix (Table A-1). Non-residential development is generally considered to be acceptable at these noise exposure levels. Figure 5 illustrates the location of these subdivisions.

The amount of residential dwelling units constructed within the 1994 Noise Contour Areas is presented in Table 14 and illustrated in Figure 6. As of this time, no residential dwellings have been constructed within the 2004 Noise Contour Areas since 1991 although there were an estimated 754 existing units constructed prior to that date (refer to Table 11).

Table 14
Residential Dwelling Units by Year Built* and Location

	Dwelling Units by 1994 Noise Contour Intervals (dB)					
Year Built	**65-69**	**70-74**	**75-79**	**80+**	**Total**	**% Total**
1991-1995	280	343	61	2	686	57%
1996-2000	230	84	64	-	378	31%
2001-2004	69	65	11	-	145	12%
Total	579	492	136	2	1,209	100%

* Through June 2004
Source: Sedgwick County Appraisers Office

There are an estimated 18,216 dwelling units located within the 1994 contour area (refer to Table 11) and approximately 1,200 of these units have been constructed over the last 14 years. Since 1995 the number of dwelling units constructed is an estimated 523, according to the county's real estate records. The rate of housing development within these contour areas has declined considerably through the first four years of this decade (2001-04) in comparison to the preceding five-year time period with 145 and 378 units constructed, respectively.

Of particular concern are the 75 units constructed after 1995 in areas with noise exposure greater the DNL 75 dB where the construction of dwellings are considered incompatible uses, based on LUCGs. Also at issue are the 448 units constructed after this date with noise exposure ranging between 65-74 dB where residential construction is discouraged, although it can be accommodated if necessary with the implementation of noise level reduction measures.

3.3 Land Use Changes - Clear Zones and Accident Potential Areas

Subdivision activity within the Clear Zones and Accident Potential Zones is summarized in Table 15. Since 1991, there have essentially been no approved subdivisions within the CZ areas. County subdivision records indicate that land subdivided within the APZ areas during this time period totals approximately 153 acres, representing portions of 13 subdivisions, which are illustrated in Figure 5. Almost all of the development in the APZ areas has occurred in APZ-II with the majority located south of the runways in and around the City of Derby. The development that has occurred in these subdivisions has primarily

been commercial-related uses along Southeast Boulevard. However, a portion of this development is a residential subdivision adjacent to 63rd Street where housing units have not yet been built although roads have been constructed. Information provided by Derby city officials indicates that no residential subdivisions were approved in the APZ area after 1991 and that the subdivisions shown in this area (in Figure 5) were actually annexed as part of more recent subdivision located outside the APZ area.

Since 1995, approximately 126 acres of land has been subdivided within the APZ-II areas. Based on the LUCGs, residential development in these areas is considered a compatible use if densities are between one and two acres per unit which is generally the density of existing lots. Commercial development is also considered compatible if the density of people and structures does not exceed certain thresholds.

Table 15
Subdivision Activity in the Clear Zones and Accident Potential Zones

	Acreage Subdivided by Clear Zones and Accident Potential Zones							
	North of Runways			South of Runways				
Year Subd.	**CZN**	**APZ-I-N**	**APZ-II-N**	**CZS**	**APZ-I-S**	**APZ-II-S**	**Total**	**% Total**
1991-1995	-	1.1	21.3	0.2	0.2	4.4	27.3	18%
1996-2000	-	-	-	-	-	61.1	61.1	40%
2001-2004	-	-	6.7	-	-	57.9	64.5	42%
Total	-	1.1	28.0	0.2	0.2	123.3	152.9	100%

*Through June 2004
Source: Wichita-Sedgwick County MAPD and RKG Associates, Inc.

There are a total of 2,027 dwellings units that presently exist within the APZ areas (refer to Table 11). However, only 29 units have been constructed there over the last 14 years as illustrated in Table 16, and only three (3) units since 1995, according to county real estate records. Based on this data, there have been no significant amounts of incompatible residential uses developed in the APZ areas since 1995.

Table 16
Residential Dwelling Units by Year Built* and Location

	Dwelling Units by Accident Potential Zones**					
	North of Runways		South of Runways			
Year Built	**APZ-I-N**	**APZ-II-N**	**APZ-I-S**	**APZ-II-S**	**Total**	**% Total**
1991-1995	-	-	-	26	26	90%
1996-2000	-	-	-	2	2	7%
2001-2004	-	-	-	1	1	3%
Total	-	-	-	29	29	100%

* Through June 2004
** No dwelling units are located within the clear zones
Source: Sedgwick County Appraisers Office

4. LAND USE REGULATIONS

Land use and development patterns within the JLUSA and AICUZ areas are the result of the combined effects of economic forces within the greater Wichita market area and the land use regulations that determine the type and amount of development that can occur at various locations. The land use regulations that are most instrumental in determining existing and

future land use patterns are contained in the zoning ordinance. However, other regulations that also influence development include subdivision regulations, site development regulations, and building codes.

Since portions of the study area lie within the Cities of Wichita and Derby, there are two predominant sets of land use regulations that affect area development. Development in unincorporated portions of Sedgwick County is regulated jointly with the City of Wichita by the standards established in the *Wichita-Sedgwick County Unified Zoning Code*. The April 19, 2001 edition obtained from the County's web site is the document referred to in this report. In Derby, the *Zoning Ordinance of the City of Derby, Kansas (2001)* is the document that regulates development within the corporate boundaries of this municipality. Each of these jurisdictional areas has also adopted individual subdivision regulations which include the *Wichita-Sedgwick County Subdivision Regulations (October 24, 2002 edition)* and the *Subdivision Regulations of the City of Derby, Kansas (1997).* Site development standards are contained within each of the respective zoning ordinances noted above.

Building codes within the study area include those adopted by the City of Wichita, Sedgwick County, and the City of Derby. Within the last several years Wichita and Sedgwick County adopted the *2000 International Building Code (IBC)* that regulates the construction standards for residential and commercial buildings. The City of Derby currently operates under the *1997 Uniform Building Code (UBC)* although expectations are that it will eventually switch to the 2000 IBC for consistency with the county.

4.1 Zoning Overview

The current zoning regulations that control development within the JLUSA divide the land area into 26 different zoning districts that specify the permitted density and specific types of detailed land uses that may occur at various locations. From a general perspective these districts can be grouped into four major categories which include residential, commercial, industrial, and institutional. The more detailed breakout of acreage within the JLUSA for all 26 zoning districts is provided in the Appendix (Table A-2). The overview presented in this section discusses the general compatibility of these four major zoning categories with the Land Use Compatibility Guidelines (LUCG).

From the more generalized zoning perspective the JLUSA area is predominantly zoned for residential uses. As illustrated in Table 17, approximately 13,850 acres are zoned residential with 8,110 acres designated as medium/high density and 5,743 acres categorized as low density. The medium/high density residential areas permit housing at densities ranging between 2,000 sq. ft. and 20,000 sq. ft. per dwelling unit, while the low density areas require at least two acres per dwelling and as high as 4.5 acres in some areas, depending on site conditions affecting wastewater disposal system requirements. The medium/high density districts require the availability of city water and sewer, otherwise the

Table 17
Generalized Zoning JLUSA - 2004

Zoning District	Acres
Res. Med/High Density	8,110
Res. Low Density	5,743
Commercial	1,344
Industrial	2,055
Institutional	32
AFB/Federal*	2,721
Subtotal	20,005
Rights-of-Way	2,037
Total Land Area	22,042

* NOTE: AFB/Federal is not a zoning designation but rather denotes ownership of land that is controlled by McConnell AFB and/or the Federal Government
Source: City of Wichita GIS and RKG Associates, Inc.

minimum lot size increases to at least 40,000 sq. ft. depending on soil conditions for wastewater disposal (septic vs. lagoon systems).

Commercial and industrial zoning districts encompass 1,344 acres and 2,055 acres respectively, within the study area. The commercial and industrial zones typically allow for high densities of development with minimum lot sizes of 5,000 sq. ft. or less. There are also several districts in Derby reserved primarily for institutional uses such as educational facilities, hospitals, and religious buildings although office uses are also permitted.

The generalized zoning categories for the JLUSA are illustrated in Figure 7. As the figure indicates, industrial districts abut the Base along its northern and western perimeters. The northern and northeastern extents of the study area are primarily designated for medium to high density residential development interspersed with nodes of commercial zoning districts disbursed throughout the area. Southeast of the Base the land is zoned for low density residential uses except for the area within Derby's city limits which is predominantly medium/high density residential zoning.

Table 18
Acreage by Zoning Classification for 1994 Noise Contour Intervals - 2004

	Noise Contour Intervals (dB)				
Generalized Zoning	**65-69**	**70-74**	**75-79**	**80+**	**Total**
Res. Med/High Density	3,593	1,875	758	111	6,336
Res. Low Density	1,443	666	496	345	2,950
Commercial	405	289	351	76	1,121
Industrial	521	790	638	385	2,335
Institutional	9	2	-	-	12
AFB/Federal*	327	551	475	1,369	2,722
Subtotal	6,299	4,174	2,717	2,285	15,475
Rights-of-Way					2,302
Total Land Area					17,777

* NOTE: AFB/Federal is not a zoning designation but rather denotes ownership of land that is controlled by McConnell AFB and/or the Federal Government
Source: City of Wichita GIS and RKG Associates, Inc.

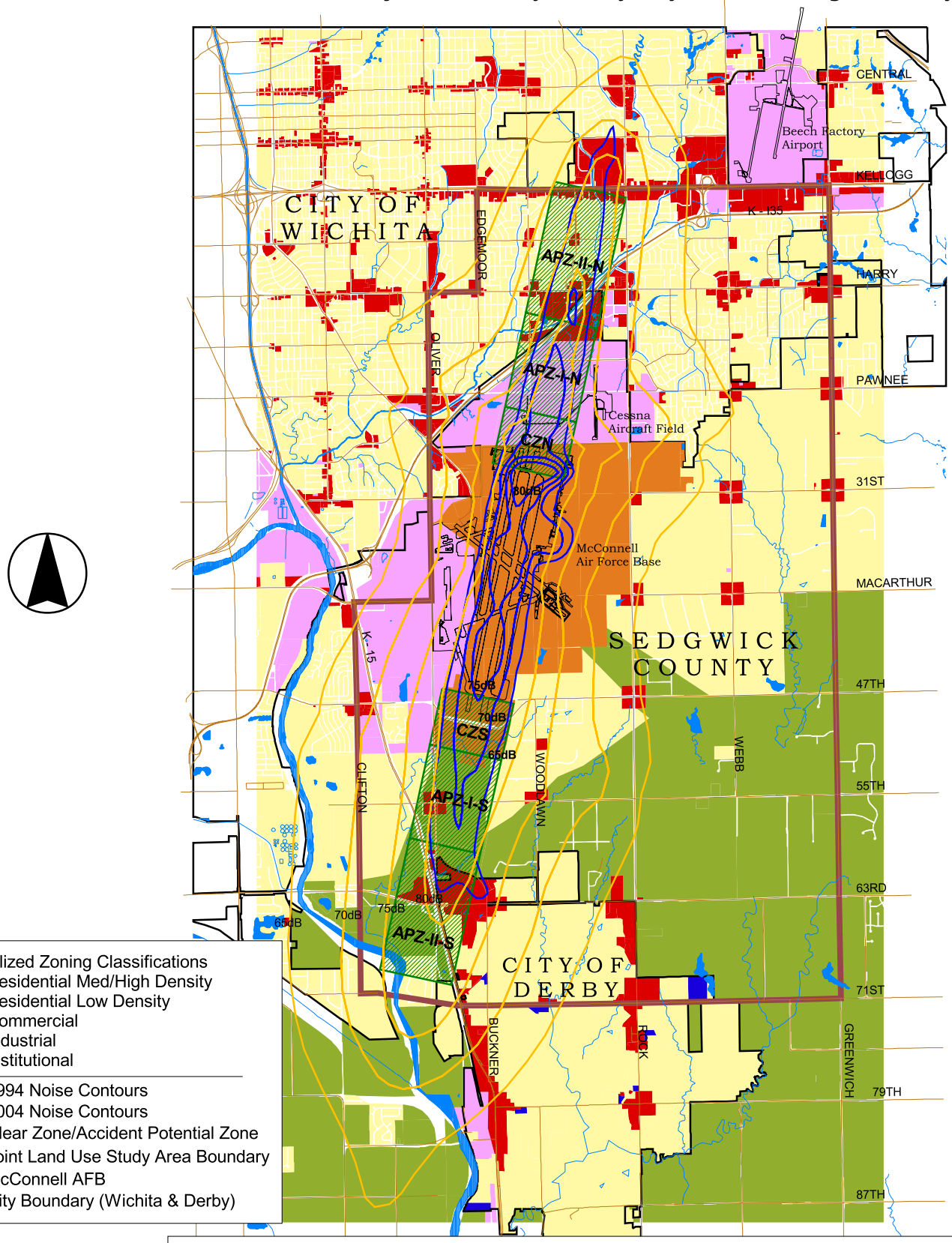
The area contained within the 1994 Noise Contour Intervals is generally subject to the same zoning designations as noted for the JLUSA. The majority of the land is zoned for residential uses (approximately 9,300 acres) with 6,336 acres designated primarily for medium/high residential development with 2,950 acres reserved for low density development, as shown in Table 18. A more detailed description of the acreage by zoning district within these contour areas is contained in the Appendix (Table A-3). Industrial zoning represents the second largest land area with 2,335 acres, followed by commercial districts with 1,121 acres.

From an overall perspective of Base operations, the areas of concern lie primarily in the approximately 6,340 acres of land that are zoned for medium and high density residential uses. The Land Use Compatibility Guidelines (LUCG) recommend that such uses <u>not</u> be permitted at noise thresholds above 75dB. At noise thresholds below 75dB (i.e. 65-74dB) the LUCGs discourage residential uses, but does make allowances for such uses if the community determines there is a need for residential development in specific locations and, if noise level reduction measures are implemented. Conversely, the existing commercial and industrial zoning districts are generally compatible with LUCG standards as long as noise reduction measures are implemented for office areas and public gathering spaces. However, in most cases, these non-residential districts also permit residential uses at high densities which are not recommended under the LUCGs. The generalized zoning classifications within the 1994 Noise Contour areas are illustrated in Figure 7.

Existing Generalized Zoning

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



Prepared by RKG Associates, Inc. - May 2005
Source: 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure 7

The acreage contained within the 2004 Noise Contour area by generalized zoning district classification is summarized in Table 19. The majority of the 2,515 acres that comprise this area are located on the Base and as such, does not present any potential land use conflicts. Similarly, the 433 acres of low density residentially zoned land, all of which is located south of the Base, is also considered suitably zoned based on LUCGs if noise reduction measures are implemented. The same is true for the 627 acres of commercial and industrially zoned land although, as noted previously, high density residential uses are generally permitted in these districts (although not within the City of Derby) which is discouraged under the LUCGs. Finally, the 187 acres of medium to high density residential zoning districts located within the noise contour area are not recommended. However, as illustrated in Figure 7, the majority of this high density zoning is located north of the Base within the Wichita corporate limits, and is estimated to be essentially built out at this point. A detailed analysis of zoning acreage within these contour areas is contained in the Appendix (Table A-3).

Table 19
Acreage by Zoning Classification for 2004 Noise Contour Intervals - 2004

	Noise Contour Intervals (dB)				
Generalized Zoning	**65-69**	**70-74**	**75-79**	**80+**	**Total**
Res. Med/High Density	144.6	42.2	-	-	187
Res. Low Density	433.0	-	-	-	433
Commercial	238.3	6.2	-	-	207
Industrial	233.9	149.0	-	-	420
AFB/Federal*	366.4	500.7	321.6	71.9	1,261
Subtotal	1,416.2	698.1	321.6	71.9	2,508
Rights-of-Way					7
Total Land Area					2,515

* NOTE: AFB/Federal is not a zoning designation but rather denotes ownership of land that is controlled by McConnell AFB and/or the Federal Government
Source: City of Wichita GIS and RKG Associates, Inc.

The final areas for which zoning was examined are the Clear Zones (CZ) and Accident Potential Zones (APZ). Table 20 summarizes the acreage of generalized zoning districts within these areas as of 2004. Along with the standard zoning district categories (i.e. residential, commercial, industrial) that have been discussed up to this point, the CZ and APZ areas are also subject to additional zoning restrictions that are discussed in the following section entitled Aviation Related Zoning Districts.

Table 20
Acreage by Zoning Classification for
Clear Zones and Accident Potential Zones - 2004

	North of Runways			South of Runways			
Generalized Zoning	**CZN**	**APZ-I-N**	**APZ-II-N**	**CZS**	**APZ-I-S**	**APZ-II-S**	**Total**
Res. Med/High Density	-	32	296	2	41	85	455
Res. Low Density	-	-	-	5.1	316.3	290.4	612
Commercial	-	52.6	150.8	-	28.9	133.8	366
Industrial	138.2	293.6	1.1	1.8	3.2	4.1	442
AFB/Federal*	123.5	-	-	235.5	17.0	-	376
Subtotal	261.7	377.7	447.5	244.6	406.7	512.9	2,251
Rights-of-Way							367
Total Land Area							2,618

* NOTE: AFB/Federal is not a zoning designation but rather denotes ownership of land that is controlled by McConnell AFB and/or the Federal Government
Source: City of Wichita GIS and RKG Associates, Inc.

The LUCGs are more restrictive with regard to recommended land uses that should be permitted in the CZs and APZs. Based on these standards only agricultural uses should be permitted in the CZ areas. Given this fact, the industrial and low density residential zoning

acreage shown in Table 20 would be considered incompatible designations, although there is presently only a limited amount of industrial development at this time, while the remaining area is used for agricultural purposes.

In the APZ-I areas the LUCG standards are somewhat more permissive with regard to non-residential uses but residential uses are not recommended. Therefore, the 73 acres of medium/high density zoning and the 316 acres of low density zoning are considered to be incompatible designations for these areas. The commercial and industrial zoning designations do generally comply with LUCG recommendations; however certain types of uses within these categories may not be compatible if the density of the population using the facilities is too high.

4.2 Aviation Related Zoning Districts

In order to protect nearby development from noise and the hazards associated with low flying aircraft in the vicinity of McConnell AFB, the Air Force, the City of Wichita, the City of Derby and Sedgwick County have worked collaboratively to develop zoning regulations that address these issues. The City of Wichita and Sedgwick County have incorporated an Airport Overlay (A-O) zone and an Airport Hazard Zoning Code into their Unified Zoning Coded. Although the City of Derby has not specifically adopted the A-O, the city has incorporated the same types of provisions into their base zoning districts that correspond to the APZ areas.

The Wichita/Sedgwick County Zoning Code's A-O district, which was adopted in 1991, has defined boundaries that correspond directly to the CZ and APZ areas established by the Air Force for preventing incompatible uses in these locations. The zones coincide with the Clear Zones and APZs I and II, which are further defined as north or south districts. The Airport Overlay I – North (A-O I-N) and Airport Overlay I – South (A-O I-S) correspond to the northern and southern Clear Zones (See Table 21). Both of these A-O-I districts are further divided into three sub-districts: the east; central; and west districts. The central district between the two zones allows for agricultural uses, parking lots, runways and taxiways, storage and cemeteries. However, the eastern and western sub-districts allow for additional land uses such as warehouses, concrete plants, and wholesale and equipment suppliers. These latter types of land uses are not considered to be compatible with these areas based on the LUCG standards.

Proceeding further from the runway ends into Airport Overlay II- North (A-O II-N) and Airport Overlay II – South (A-O II-S), most land uses are permitted with some exceptions. These include certain types of residential development (less than 4.5 acres of lot development per dwelling unit, assisted living and group residences), inns, hotels, and campgrounds, restaurants, retail food stores, hospitals, day car centers, schools, churches or places of worship, correctional facilities and recreational entertainment facilities that would attract more than 25 spectators per acre.

The last zones, Airport Overlay III – North (A-O III-N) and Airport Overlay III – South (A-O III-S) restrict the same types of development as the A-O II zones with one exception; the residential uses that are prohibited in the A-O III zones are those that are less than

40,000 square feet of lot area per dwelling unit if located in the county, or less than 5,000 square feet of lot area per dwelling unit if located in the city.

There are no provisions within the A-O zoning regulations that address LUCGs within the noise contour areas defined by either the 1994 or 2004 AICUZ studies. The subdivision regulations contained within the unified land use regulations do require that sound reduction measures be implemented on structures with noise exposure greater than DNL 65 dB. However, neither the zoning or subdivision regulations place restrictions of specific types of land uses within the various noise contour intervals as recommended by the LUCGs.

Table 21
Airport Overlay (A-O) District Specifications

Map Code	District Name	District Boundaries
A-O I-N	Airport overlay I-North	The width of this district is 3,800 feet and begins at the ends of the McConnell AFB parallel Runways 19R and 19L. The length of this district extends from the ends of the parallel runways for 3,750 feet.
A-O II-N	Airport overlay II-North	This district extends northeast from A-O I-N for 4,250 feet, and is 3,800 feet in width.
A-O III-N	Airport overlay III-North	This district extends northeast from A-O II-N for 6,000, and is 3,800 feet in width.
A-O I-S	Airport overlay I-South	The width of this district is 3,800 feet and begins at the ends of McConnell AFB parallel Runways 01R and 01L. The length of this district extends from the ends of the parallel runways for 3,000 feet.
A-O II-S	Airport overlay II-South	This district extends southwest from A-O I-S for 5,000 feet, and is 3,800 feet in width.
A-O III-S	Airport overlay III-South	This district extends southwest from A-O II-S for 7,000 feet, and is 3,800 feet in width.

Source: Wichita-Sedgwick County Unified Zoning Code Article III: Zoning District Standards – Part 4

The City of Wichita and Sedgwick County have also adopted an Airport Hazard Zoning Code, identifying certain hazards in the vicinity of an airport as a public nuisance and further mandating that the creation or establishment of new hazards be prevented. The zoning code applies to airports that are owned, operated or controlled by the governing body or the Wichita Airport Authority, and any military airport within 50,000 feet of the city limits. At this time, the facilities included as part of this regulation are Wichita Mid-Continent Airport, Colonel James Jabara Airport, McConnell Air Force Base, Beech Factory Airport, Cessna Aircraft Field, and the Wichita Police Department heliport[10] (See Table 22).

The requirements for this zoning code are primarily based on Federal Aviation Regulation Part 77, Objects Affecting Navigable Airspace, and vary according to different types of

[10] City of Wichita, City Code Regulations, Chapter 28.08 Airport Hazards Zoning Code, December 2004.

airports (e.g. level of precision approach, military, etc.) Therefore, the specifications for the zones and height limits of each of these airports differ, and are identified in the code.

A portion of the southern APZ-II area lies within the City of Derby. Unlike the Wichita/Sedgwick County Code, Derby's zoning ordinance does not define a specific overlay zoning district that pertains to the land area within this APZ. Instead, the city has addressed the issue of land use compatibility in this area by regulating the types of uses permitted in the base zoning districts that intersect with the boundaries of the APZ area.

Table 22
Airport Hazard Zoning Code

Zone	Zone Boundaries	Zone Height Limits
Military Runway Approach Zone	Applicable to Runways 19L/1R, 19R/1L, the inner edge of this approach zone coincides with the width of the primary surface and is 2,000 feet wide for both ends of the primary surface for each runway. The approach zone extends uniformly to a width of 16,000 feet at a horizontal distance of 50,000 feet from both ends of the primary surface of each runway. Its centerline is the continuation of the centerline of the runway.	Slopes one foot up for each fifty feet, beginning at the end of, and same elevation as the primary surface, extending along the extended runway centerline until it reaches a height of 500 feet above the airport elevation. Then it continues to a point 50,000 feet from the point of beginning.
Transitional Zones	The areas below the transitional surfaces.	One foot upward for each seven feet outward, beginning at the end of, and the same elevation as, the primary surface and the approach surface, and extending to a height of 150 feet above the airport elevation.
Inner Horizontal Zones	This zone is established by describing arcs with radii 7,500 feet from the center of each end of the primary surface of each runway and connecting the adjacent arcs by drawing lines tangent to those arcs. This zone does not include the approach and transitional zones.	Height limit is established at 150 above the airport elevation.
Outer Horizontal Zone	This zone is established by constructing a line 30,000 from the periphery of the conical surface, but does not include approach zones or transitional zones.	Height limit is established at 500 feet above the airport elevation.
Conical Zone	This zone is established as the area that commences at the periphery of the inner horizontal zones and extends outward for a horizontal distance of 7,000 feet to a height of 500 feet where it interests the outer horizontal zone.	Height limit slope one-foot upward foe each twenty feet outward, beginning at the periphery of the inner horizontal zone and at 150 feet above the established airport elevation and extending to a height of 500 feet above the airport elevation.

Source: City of Wichita, Chapter 28.08 Airport Hazard Zoning Code

Based on the GIS zoning data layer provided by the City of Derby there are three zoning districts that lie within the boundaries of the APZ areas, all of which are in the southern APZ-II area. These zones, and their respective acreages, include the B-5 district (82 acres),

a small portion of the B-3 district (11 acres), and a section of the R-1 district (48 acres) that fronts on highway K-15. In fact, all of the existing land uses within Derby's R-1 district in this APZ area are non-residential uses despite the residential zoning classification. This is because the R-1 designation occurred as a matter of policy when this area was annexed by the city but was never revised to reflect the actual land uses that already existed there.

The B-5 district is the Restricted Commercial, Warehousing and Limited Manufacturing District. The statement of intent for this district directly addresses the APZ area by stating that "this district is designated to permit non-residential uses that (1) are compatible with and have employee and customer densities which are appropriate for land designated, by the United States Air Force's *Air Installation Compatible Use Zone (AICUZ) Study*, as being within Accident Potential Zone 2 of McConnell Air Force Base; …and (3) are appropriate for development on land experiencing aircraft noise exposure equal to or in excess of 75 DNL." The ordinance also lists a series of uses that were determined to be compatible with LUCGs for the APZ-II area as well as providing a table of the maximum number of persons/acre that are permitted for specific durations of time during a 24 hour period, which were derived from the 1994 AICUZ Study prepared by the U.S. Air Force.

The B-3 General Business District does not relate as directly to the APZ areas as the B-5 district. However, a provision of the B-3 district does state that development of any site that is located within the APZ-II, as established by the 1994 AICUZ Study, must observe the persons per acre density requirements established in the B-5 district. This provision helps to mitigate the fact that numerous uses permitted within this district would not otherwise be compatible with the development standards recommended in the LUCGs.

The R-1 Single-family Residential District is a residential district, with a minimum lot size of 8,400 sq. ft. per dwelling that also permits a variety of public and institutional uses. There are no provisions within this district that recognize the limitations of the APZ area as do the B-5 and B-3 districts. In general, the standards of the R-1 district would not be considered compatible with those recommended by the LUCGs. However, this portion of the R-1 district is essentially built out at this point with non-residential uses that make the current zoning designation a non-issue.

4.3 Other Land Use Regulations

Derby's subdivision regulations (dated 1997) contain two provisions that pertain specifically to reducing potential conflicts with development and the operations of McConnell AFB, as well as other airports. Section 609 indicates that land located within established flight paths and noise impact areas of public-owned airports shall be required to grant a permanent avigational easement to the public allowing aircraft to operate within these areas. (Note: McConnell AFB is "interpreted" as being a public airport although not specifically defined as such in the regulations). This section also requires that a restrictive covenant be recorded stating that any building placed on land covered by this avigational easement shall be designed and constructed to minimize noise pollution, and that aircraft noise may infringe upon a resident's enjoyment of the property. Section 610 of the subdivision regulations is specifically directed toward McConnell AFB, requiring that land located within the APZ areas and "adverse noise contours" defined in the AICUZ Study (intended to mean the 1994 version of the study but no date is supplied) must comply with

the recommendations of that study. Both of these provisions offer a significant level of protection from the creation of incompatible land uses in the vicinity of the Base. However, according to local officials, the implementation of these provisions is not regularly enforced as part of the development review and approval process.

Wichita's and Sedgwick County's subdivision regulations contain the same provision found in Section 609 of Derby's regulations. Section 7-107 of the Wichita-Sedgwick County Subdivision Regulations (October 24, 2002 edition) indicates that all land within established flight paths of McConnell (as well as other public airports) must grant a permanent avigational easement to the public. It further requires that a covenant be recorded stating that any building constructed shall incorporate noise reduction measures and that noise may impact the use of said structure. This provision refers to the AICUZ study for defining noise impact areas, but does not specify the 1994 version of this report, which could result in a conflict of interpretation since a 2004 update of the AICUZ is now available. Reportedly, the MAPD regularly requires any request for subdivision within the regulated area (which is apparently defined by the DNL 65 dB delineation from the 1994 AICUZ) to provide the easement and restrictive covenants which are then appropriately recorded. It is estimated that 15-20 subdivisions per year are affected by these regulations.

Although the subdivision regulations require that noise reduction measures be implemented during the construction of potentially affected homes or other structures, there are no supporting standards in area building codes to address these measures. Discussions with local building code enforcement officials revealed neither the IBC nor the UBC contain specific provisions with regard to sound attenuation measures within noise zones around McConnell AFB. Furthermore, neither the Cities of Derby or Wichita, or Sedgwick County have adopted any special resolutions or amendments to these codes that would address this issue. Therefore, while the zoning and subdivision regulations may require that potential noise impacts be addressed during the development review process there does not seem to be an enforcement mechanism within the building codes. This, in effect, places the responsibility on the developers or builders to ensure that the restrictive covenants are being implemented.

5. FUTURE PLANNING INITIATIVES

This section examines current comprehensive planning studies that relate to potential future development in the area around McConnell AFB. Long-term planning in the study area primarily falls within the purview of two jurisdictions. The first is the Wichita-Sedgwick County Comprehensive Plan (WSCCP), which is adopted by the Wichita Metropolitan Planning Commission and updated periodically by the Metropolitan Area Planning Department (MAPD). Second is the comprehensive planning efforts conducted by the City of Derby that includes the southern section of the JLUSA which lies within the city's jurisdictional area.

The future land use portion of the WSCCP was recently updated (December 2004) although it is still considered to be a proposed revision since it has not yet officially been adopted by the Planning Commission. The planned growth within the JLUSA is reflected on the 2030 Wichita Functional Land Use Guide map which is illustrated in Figure 8. The areas of

particular note on the map are located east and south of the Base and denoted as the Wichita Growth Areas. These areas are presently unincorporated portions of the county where it is anticipated the City of Wichita will expand over the next 30 years. This plan for long-term growth is predicated on a combination of expected demand from economic market forces to continue historical growth patterns in this area, as well as the fact that municipal water and sewer utility systems will be able to service these areas within this planning horizon.

The 2030 growth areas shown on the map are divided into two categories. The land immediately adjacent to the Base is designated as a future growth area for employment and industry that would allow for flexible zoning to accommodate non-residential development. The Planning Commission has already received a number of requests for commercial rezoning within this future land use area. The remainder of the growth area would allow for a continuation of the high density residential development that presently exists within the Wichita corporate limits.

Other long-term planning considerations presented on the WSCCP 2030 growth map include the area contained within the boundaries of the Oaklawn/Sunview Neighborhood Revitalization Plan. This plan, which was completed in 2001, focuses much of its recommendations on improving housing conditions and existing infrastructure systems within this neighborhood. However, the plan also contains recommendations for future land use that include areas of industrial and commercial development along highway K-15 that lies within the APZ areas.

Another aspect of the WSCCP's long-term planning relates to proposed improvements to the transportation network. The 1999 update of the plan included anticipated upgrades to surface roadways within the JLUSA through 2030. Some of these improvements include upgrading Rock Road, from the Wichita city boundary to the Derby city boundary, from a four- to a five-lane arterial. In addition, 63rd Street, for its entire length within the study area, has already been upgraded to a four-lane arterial based on these recommendations. Other anticipated transportation improvements are also presented in the plan.

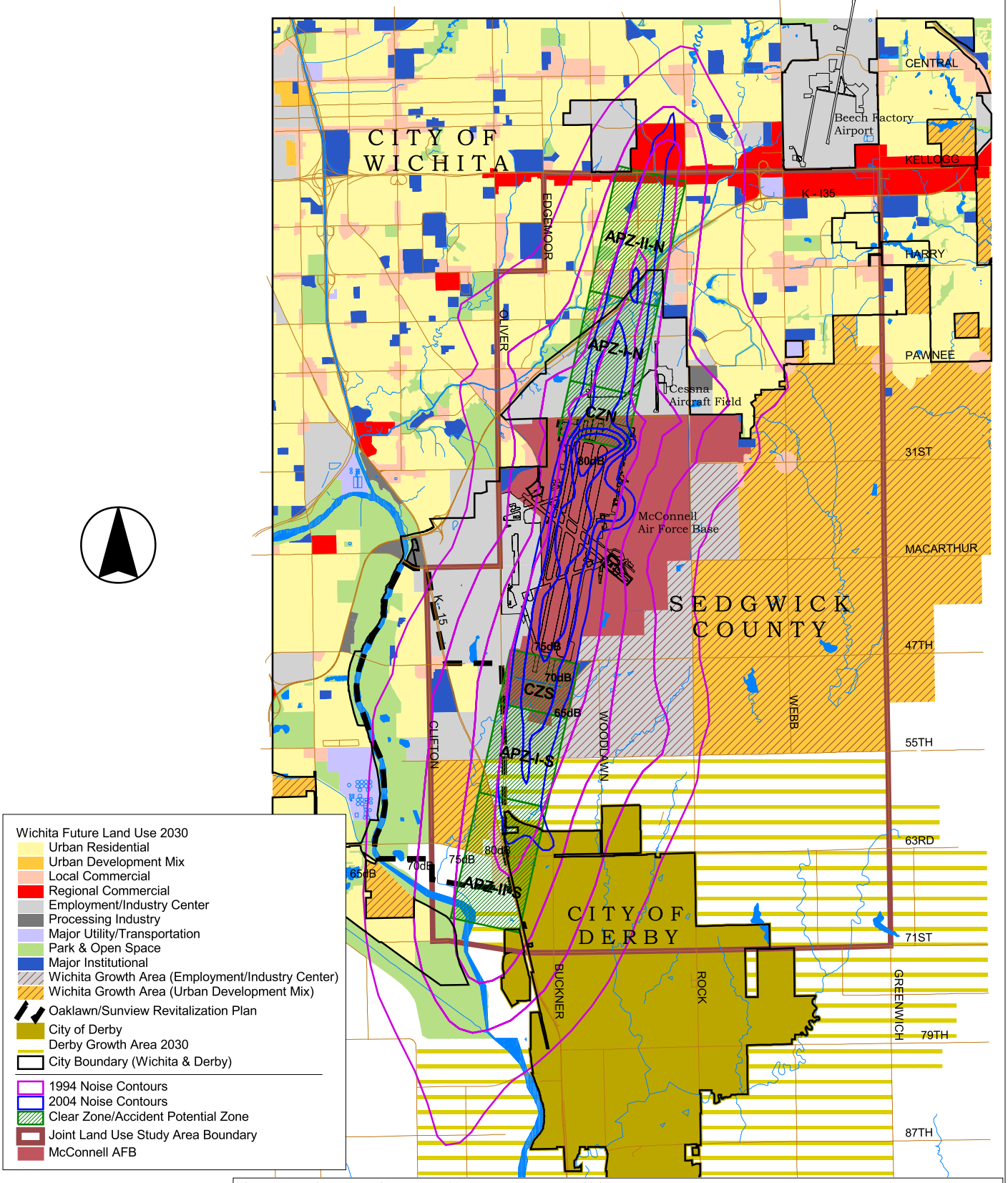
An updating of the long-range transportation plan is expected to begin in early 2005 with anticipated completion later that year. It is possible that further improvements to the roadway system within the study area may be recommended within the revised plan. In addition, a new South Area Transportation Plan (SATS), expected to begin in the spring of 2005, will examine the need and potential corridor locations for possible long-term creation of a circumferential highway that could eventually connect K-96 with the Northwest Bypass corridor. It is anticipated that this study would evaluate potential corridor location in and around the JLUSA which would impact growth and land use development patterns in the area.

To the south of Wichita's planned growth boundary, shown in Figure 8, is the Small City Growth Area of the City of Derby, which includes land between 63rd and 55th Streets. The City of Derby is just beginning the process of updating its comprehensive plan that was last revised in 1995. However, based on discussions with local planners, 55th Street has

Future Land Use/Growth Areas - 2030

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



Prepared by RKG Associates, Inc. - May 2005
Source: Wichita-Sedgwick MAPD; 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure 8

historically been considered to be the northern growth boundary up to which Derby would expand. It represents Derby's current subdivision jurisdictional boundary and the city has already expanded its corporate boundary into this area with approvals for residential and commercial development approximately one half mile beyond 63rd Street. There is however, some question as to whether the municipal sewer system will be able to service future development beyond that which has already occurred, a question that will presumably be addressed as part of the comprehensive plan update. However, a new water tower is presently being constructed, as recommended in the 1995 comprehensive plan, which will improve water pressure north of 63rd Street.

A final consideration that could effect future development within the study area is the existence of environmental features such as wetlands, slopes, aquifers, or important habitat. A survey of secondary data sources was conducted to determine if there are any significant environmental constraints present in the study area that could represent limitations for future development. Based upon a review of county and state maintained natural resource inventories, the most limiting constraint within the study area appears to be related to surface waters. There are numerous river and stream channels that course through the study area including portions of the Arkansas River, Gypsum Creek, Spring Creek, and a number of other unnamed tributaries. These riparian corridors represent sensitive habitat and are important from the standpoint of protecting drinking water quality in the area. Although the existence of these river and stream corridors does not represent significant limitations for development they will affect to some degree, site development on parcels through which these channels traverse.

In some locations, these surface water corridors have associated areas of wetlands and floodplains that also represent limitations for development. Wetlands also represent sensitive habitat that support wildlife and help to protect the quality of their related stream corridors from pollution and flooding. Although there is not a substantial amount of wetlands found within the study area, their existence would likely warrant a somewhat larger buffer from development in those area. It should be noted that the wetlands described here represent locations where wetlands would be *expected* to occur based on other data sources but have not actually been field verified in all locations.

Floodplains are the third potential environmental constraint associated with study area surface waters. The 100-year floodplain areas do not effect a substantial amount of acreage within the study area. However, their existence could, once again, necessitate additional site planning requirements and possibly limit development density in some cases.

The review of environmental databases did not reveal any other critical habitat, the existence of rare, threatened or endangered species, or major limiting factors for development.

6. EXISTING AVIATION CONDITIONS

In addition to McConnell Air Force Base, there are a number of aviation facilities located in the Wichita area, each serving a unique purpose and role. Wichita Mid-Continent Airport is the only airport to serve scheduled air passenger flights. It also has significant cargo activity as well as a strong base for general aviation operations. All military aircraft flights are

operated out of McConnell Air Force Base, which is located about seven and a half miles east of the Wichita Mid-Continent Airport. Just north of McConnell Air Force Base is Cessna Aircraft Field. Very little flight activity occurs at this facility, with most flight operations involving research and development activities. Located about six miles northeast of McConnell Air Force Base is Beech Factory Airport. Its primary purpose is the manufacturing of Raytheon aircraft and parts, and generally is used by Raytheon aircraft or business invitees. About two miles northeast of Beech Factor Airport (BEC) is Colonel James Jabara Airport. Operated by the Wichita Airport Authority, this facility serves the General Aviation (GA) needs of the community. The coordination and interaction between these facilities is critical to safe, efficient operations of aircraft in the region. The Federal Aviation Administration (FAA), combined with the McConnell Air Force Base Air Traffic Controllers, are responsible for the safe and efficient separation of aircraft and management of airspace in the region. With the exception of Cessna Aircraft Field, none of these facilities are within the Clear Zones, Accident Potential Zones, Aircraft Departure Corridors or noise contours identified for McConnell Air Force Base.

6.1 Existing Conditions and Civil Aviation Activity

Significant levels of flight activity occur in the vicinity of McConnell Air Force Base. As noted above, three other airports are located within a 10-mile radius of the Base. The general orientation of the runways at Beech Factory Airport (BEC) and Colonel James Jabara Airport (AAO) are similar to the alignment of the runways at McConnell Air Force base. BEC falls within the eastern edge of Wichita Mid-Continental Airport's Class C airspace but outside McConnell's airspace due to an exception made in the typical airspace configuration. The third facility, Cessna Aircraft Field, is privately-owned by Cessna Aircraft Company. It has very few flight operations but is classified as a public-use airport.

1) Beech Factory Airport

The Beech Factory Airport has one runway, Runway 18/36, which is 8,000 feet long and 100 feet wide, constructed of grooved concrete. It is a privately-owned, public-use airport. Because of the proximity to McConnell Air Force Base and the large aircraft operations there, the airspace allotted for airport traffic area only extends up to 2,500 feet [1,113 feet above ground level (AGL)]. There is a Letter of Agreement (LOA) in place between McConnell Air Force Base and Beech Factory Airport for shared use of the airspace and prior coordination of instrument flight activity. This restricts the operations to below 2,500 feet. The contract Air Traffic Control Tower is normally open from 7:30 a.m. to 5:30 p.m., Monday through Friday. Although uncontrolled after hours, the airport's Unicom frequency is monitored by Beech Factory.

The facilities at BEC consist of over 35 buildings owned and used by Raytheon Aircraft Services. Additionally, the environs around the airport are primarily industrial parks and large development associated with support of industrial and aircraft manufacturing. There are approximately 32,000 operations at Beech Factory Airport per year, and 77 based aircraft[11]. The primary purposes of this aircraft activity are: 1) Raytheon or Beechcraft aircraft owners flying in for service, 2) research and development flights by

[11] AirNav, Beech Factory Airport, December 2004.

Raytheon, or 3) delivery of new aircraft[12]. The number of operations has fluctuated somewhat over the last few years but generally remained relatively constant. No significant changes are anticipated to occur that would effect the level of activity at the airport in the near future.

2) Colonel James Jabara Airport

Colonel James Jabara Airport is located approximately 2.5 miles northeast of Beech Field and about nine miles from McConnell Air Force Base. Runway 18/36 is 6,100 feet long and 100 feet wide, constructed of grooved concrete. The airport is a public use airport operated by the Wichita Airport Authority. The Airport is uncontrolled and uses a Unicom frequency that is monitored by Midwest Corporate Aviation. Similar to Beech Factory Airport, the altitude for operations around the vicinity of this airport is restricted to traffic patterns of 800 feet AGL, to allow for heavy Air Force flight activity into and out of McConnell Air Force Base, which generally occupies airspace above 2,500 feet. The Fixed Base Operation (FBO) provides 24-hour fueling and services for based and transient aircraft operations.

There were approximately 38,700 operations at Jabara Airport in 2003, and 153 aircraft are based there[13]. Activity projections in the airport's master plan indicate anticipated growth to approximately 44,200 operations by 2008, with 170 based aircraft.

3) Cessna Aircraft Field

Cessna Aircraft Field is located just north of McConnell Air Force Base. It is a privately-owned, public use airport with two parallel runways. The western runway that nearly aligns with a runway at McConnell has been permanently closed. However, the eastern runway remains open. Pilots flying out of Cessna Aircraft Field are requested to coordinate flight activity prior to takeoff.

This facility experienced significantly higher levels of activity back in the 1970s and 1980s than is present today since few research and development aircraft presently operate at this facility. There are approximately 100 operations at Cessna Aircraft Field per year, with 10 based aircraft[14]. Based on the low level of activity over the past few years, the close proximity of the airfield to McConnell Air Force Base and the nature of the facility, operations are not anticipated to significantly change in the near future.

4) McConnell Air Force Base

There are two parallel 12,000 foot runways at McConnell Air Force Base. Runways 01L/19R and 01R/19L accommodate the normal activity at the base. Wind conditions favor Runway 19 operations approximately 85% of the time, and approximately 85% of the Base's flight activity occurs during daytime hours[15]. Approximately 70,000 aircraft operations per year occur at McConnell with an average busy-day level of activity of

[12] Beech Factory Airport, Air Traffic Control Tower, December 2004.

[13] Executive Summary for the Airport Master Plans at Wichita Mid-Continent Airport and Colonel James Jabara Airport, Wichita Airport Authority, 2004.

[14] AirNav, Cessna Aircraft Field, 2004.

[15] McConnell Air Force Base AICUS study, AICUZ Resource Book, 2004.

approximately 264 aircraft operations. The majority of the activity, 79%, is from based aircraft, and the balance of 21% is transient military flights. Approximately 13% of these total operations occur during nighttime hours, defined as after 10:00 p.m. and before 7:00 a.m.[16] Typical Air Force flight operations, engine run-ups and the arrival or departure of aircraft for maintenance comprise the majority of these operations at McConnell Air Force Base. The completion of engine run-ups in specified locations is intended to minimize the overall noise impact to the personnel living and working on Base as well as the communities in the airport environs.

Limited civil aircraft activity also occurs at McConnell Air Force Base through a joint use agreement with Boeing. The Boeing Company performs aircraft modification to heavy, air carriers at its facility on the west side of the Base. The modification business results in engine run-ups, test flights, and arrivals and departures of maintenance aircraft. The level of operations has fluctuated since 2001. According to Boeing, in 2001 a total of 306 operations (including both take offs and landings) were performed by aircraft with business at Boeing, compared to 198 operations in 2004. The projections by Boeing for 2005 are that an increase in activity (as high as 472 operations) may occur. However, the outlook over the next several years is that the average operations will remain relatively constant with the potential for a slight increase year by year, depending on changes in the modification program. The increase in 2005 activity is due to a flight testing activity that is not typical for the facility. Approximately 12 aircraft are at the facility at any given time for the completion of repairs or modifications.[17]. According to the 2004 AICUZ study, operations from the Boeing facility were included in the overall noise analysis completed for the recent update of this report.

Three other groups of aircraft operate at McConnell AFB: 22nd Air Refueling Wing (22 ARW), active duty; 931st Air Refueling Group (931 ARG), which is part of the Air Force Reserve Command; and the 184th Air Refueling Wing (184 ARW), a component of the Kansas Air National Guard.

The Air Traffic Control Tower (ATC) controls local departures and arrivals into and out of McConnell Air Force Base, and Letters of Agreement are in place with the FAA ATC at Wichita Mid-Continent Airport relative to tower hours, airspace configuration and instrument conditions. Instrument approaches into McConnell are initially handled by the FAA facility. Given the proximity of the McConnell Air Force Base and Wichita Mid-continent Airport, the airspace is divided and shared between the two facilities. The ATC is currently open 24 hours per day, and closed only on certain holidays[18]. When the ATC is closed, the airfield is closed, and the Base relinquishes control of the shared airspace back to Wichita/FAA control.

[16] McConnell Air Force Base AICUZ Study, 2004.
[17] Boeing Test Manager and Forecast Acitivty/ATC, January 2005
[18] McConnell Air Force Base Air Traffic Control Tower, December 2004.

6.2 Comparison of 1994 and 2004 AICUZ Studies

As discussed earlier in this report, the Air Force conducts Air Installation Compatible Use Zone (AICUZ) studies to promote compatible development of land around military installations. These studies are also intended to minimize negative impacts to nearby communities through proper planning, protecting citizens from noise exposure and accident potential while maintaining the integrity of the Air Force mission.

The mission at the time of the 1994 AICUZ study included a high percentage of B-1B "Lancer" aircraft activity, which is a very loud jet aircraft. The noise characteristics of this aircraft and the overall fleet, combined with the level of sorties or missions flown at McConnell Air Force Base, resulted in noise contours that encompassed an area of land significantly larger than the boundaries of the Base, as illustrated in Figure 1 presented earlier in this report.

Land use compatibility planning intended to protect the nearby communities and the military mission was based in part on these noise exposure contours. Noise contours were developed to define areas exposed to DNL 65dB and higher. This is the level of noise "significance" recognized by the USAF, U.S. Department of Transportation (USDOT), the FAA and other federal agencies. Due to the nature of the aircraft operations at the time the 1994 AICUZ study was completed, the area exposed to significant noise, that is, DNL 65dB and higher, was large, encompassing over 17,000 acres.

In addition to identifying the noise exposure, the AICUZ study identified and assessed land use compatibility within zones that correlate to the Air Force's statistics on accident potential. As noted earlier in this report there are three different zones based on the potential for accidents to occur. The Clear Zone (CZ), which is closest to the runway ends, has the highest potential for accidents. Adjoining the CZ is the Accident Potential Zone I, followed by the Accident Potential Zone II.

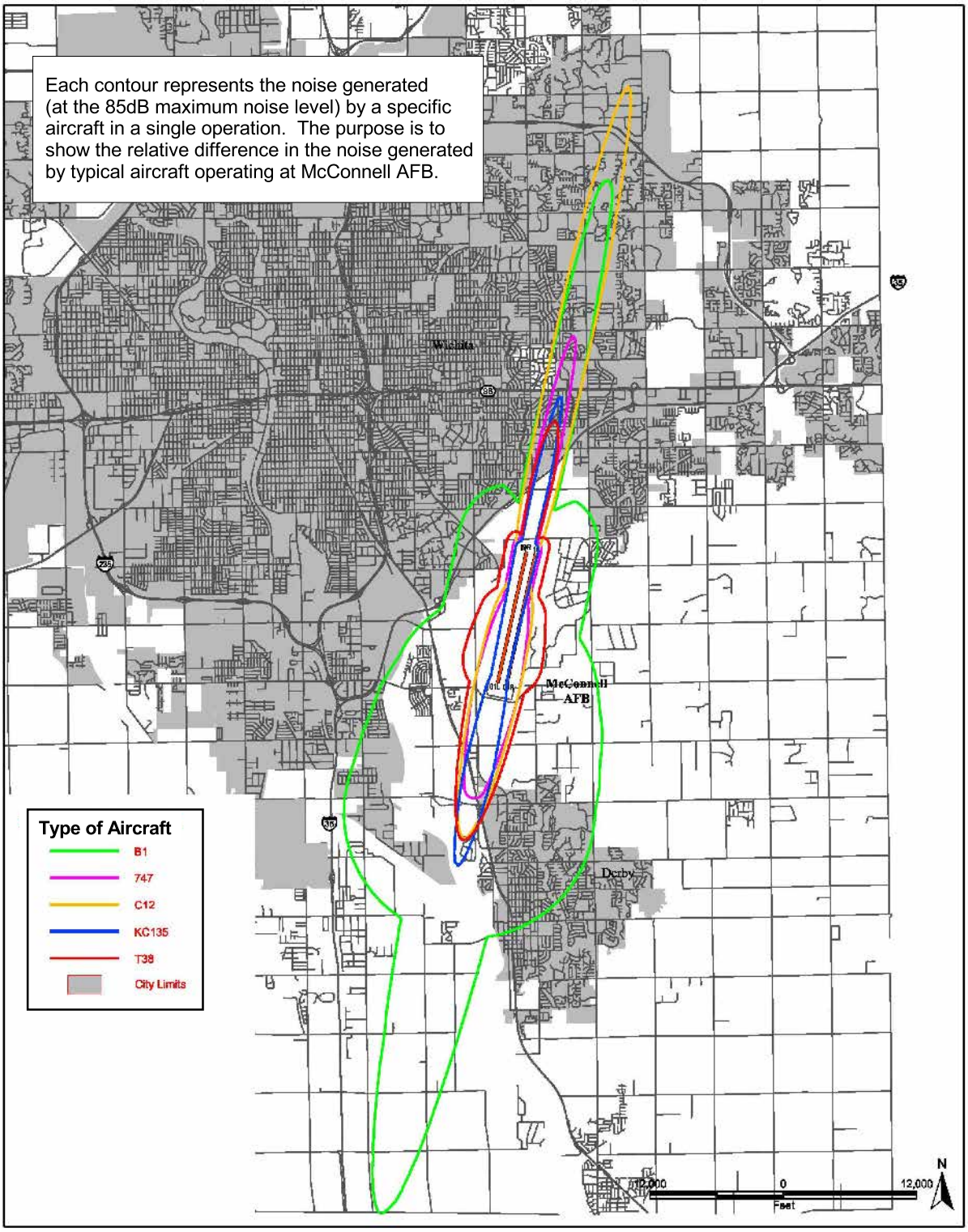
Each zone has varying degrees of recommended restrictions. In CZs, the Air Force policy is to acquire property through purchase or easement where possible; in APZs the policy is to encourage land use planning and control[19]. The boundaries of the CZs and APZs are based on the Air Force's assessment of accident potential and do not change based on flight activity or mission status. However, land use within the zones may change over time and was reviewed as part of the AICUZ study.

In 2004, the 1994 AICUZ study was updated due to the reassignment of the B-1 aircraft and related activity to other facilities in 2002, followed by a change in mission for the 184th ARW to a KC-135 refueling wing. This significant change in aviation activity justified the need to update the AICUZ study and reassess noise exposure.

[19] McConnell Air Force Base AICUZ Study, 2004.

Representative Aircraft Noise Contours

McConnell Air Force Base Joint Land Use Study City of Derby - City of Wichita - Sedgwick County



Prepared by Ricondo and Associates, Inc. - May 2005

Figure 9

Figure 1 illustrates the 1994 noise contours in comparison to the 2004 noise contours. The contours are shown in 5 dB increments from DNL 65 to DNL 80+. The 1994 contours encompassed a significantly larger area than the 2004 contours, due mostly to the change in the mission performed at McConnell Air Force Base. Changes to the type of aircraft, frequency of flights, and particularly nighttime compared to daytime operations can significantly affect the noise contours. Shown in Figure 9 are Single Event Level (SEL) contours for individual aircraft. This depicts the comparison between the B-1, C-12, B-747, T-38 and KC-135 aircraft. The B-1 no longer has a significant presence at the Base, and has been replaced primarily by the KC-135 operations. Additional aircraft that typically operate at the Base are the B-747 and T-38. The B-747 comprises only a small number of operations so it is not a controlling factor in the overall noise exposure. Generally, this graphic shows the relative difference in noise impact that can result from a change in the flight mission. It compares the 85 dB LMax associated with a single aircraft operation (.5 arrival and .5 departure) for each of the aircraft. Maximum Noise Level, Lmax is the maximum, or peak, sound level during a noise event. The Lmax metric accounts only for the instantaneous peak intensity of the sound, and not for the duration of the event. Some sound level meters measure the maximum or Lmax level of aircraft noise events. This does not depict the annual cumulative noise impact for aircraft operations, but rather the single event noise contour that is produced from each of these aircraft.

Table 23
Acres within the 1994 and 2004 Noise Contours

DNL Noise Contour	Acreage	
	1994 AICUZ	2004 AICUZ
65-69	7,547	1,400
70-74	4,752	713
75-79	3,065	329
80+	2,406	68
Total	**17,770**	**2,510**

Source: US Air Force, AICUZ Study, Comparison with 1994 AICUZ Study, 2004

Table 24
Generalized Existing Land Uses Within DNL 65 dB and Greater Noise Exposure Area (Off-Base)

Category	Acreage
Residential	199
Commercial	145
Industrial	499
Public/Quasi-Public	2
Recreational	30
Open/Agricultural/Low Density	391
Total	**1,265**

Source: US Air Force, AICUZ Study, 2004

Table 25
Generalized Existing Land Uses Within the McConnell AFB Accident Potential Zones (Off-Base)

Category	Acreage
Residential	488
Commercial	172
Industrial	693
Public/Quasi-Public	5
Recreational	80
Open/Agricultural/Low Density	787
Total	**2,225**

Source: US Air Force, AICUZ Study, 2004

Typically, where communities undertake noise mitigation or land use controls, the DNL 65dB contour is used as a planning guide. Some communities have used the DNL 60dB contours as the outer limit for these efforts, but only when that level of noise exposure has been formally adopted as the community standards for significance. Table 23 presents the acreage associated with each of the DNL noise contours, in 5 dB increments. Compared to the 1994 AICUZ, there was a reduction of over 15,000 acres of land exposed to noise levels of DNL 65dB and higher.

With establishment of noise exposure contours, a comparison of noise sensitive land uses and other compatible land uses can be made. The area that is impacted by noise can be

measured in acres to assess the overall impact. Table 24 identifies the generalized land uses that fall within the DNL 65dB and higher noise contours for the 2004 AICUZ, both north and south of the Base property boundaries.

In addition to identifying the acreage that is encompassed within the noise contours, a similar assessment was completed for the area contained within the Base's Accident Potential Zones. This is presented in Table 25. Some of the areas identified fall within both the DNL 65dB and the Base's APZs.

7. EXISTING LAND USE AND AVIATION CONFLICTS

This section of the report identifies and evaluates land use and airport conflicts that currently affect McConnell AFB's existing mission. These conflicts can be broadly categorized as safety and noise impacts. The land area that represents potential safety hazards is defined by the off-Base portions of the Clear Zones (CZ) and Accident Potential Zones (APZ) identified in the recently completed 2004 AICUZ study. Similarly, potential noise conflicts are defined as the land area located within the noise contour area where noise exposure is in excess of 65 decibels (dB).

Airport conflicts are defined as those that could occur due to operations related to McConnell's existing mission, when taken in conjunction with the activities of nearby civilian airports and aircraft testing facilities, that result in potentially hazardous flying conditions. These potential conflicts take into account current and future flight activities at the Colonel James Jabara Airport as well as the privately operated Cessna and Beech Factory airport facilities.

The standards used to determine what constitutes a land use conflict are the federal guidelines[20] commonly used when conducting Joint Land Use Studies, which where also referenced in the 2004 AICUZ study. These Land Use Compatibility Guidelines (LUCG) are summarized in the Appendix, as well as in the accompanying sidebar presented here. The LUCGs identify those land uses that are recommended, not recommended, or recommended under certain conditions (e.g. if noise level reduction measures are implemented), within the CZ/APZ areas as well as the noise contour areas.

Overview
Land Use Compatibility Guidelines (LUCG)

The two central issues related to land use compatibility around McConnell AFB are safety and noise. The fundamental principles of compatibility criteria are:

- Limit exposure of people and noise sensitive activities to high level noises, and
- Limit concentrations of people and safety sensitive activities in areas of highest probable accident impact.

Examples of land uses that are susceptible to higher noise levels (e.g. greater than 65dB) include:

- Residences and places were people sleep, such as hotels, hospitals, and nursing homes
- Uses such as schools, libraries, churches, museums, theaters, and uses where it is important to avoid interference with speech, and concentration on reading or visual material.

Land uses that result in concentrations of people that are incompatible with high hazard zones, which include the Clear Zone and APZ-I and APZ-II, include:

- Residences and similar uses where people reside, such as hotels or nursing homes
- Employment uses with high density of employees, such as offices or labor-intensive industrial uses
- Uses where people gather in large numbers such as churches, schools, shopping centers, restaurants, and spectator sports

[20] *Guidelines for Considering Noise in Land-Use Planning and Control*, Federal Interagency Committee on Urban Noise, 1980, and the *Standard Land Use Coding Manual*, U.S. Department of Transportation.

7.1 Land Use Conflicts

The area affected by the existing mission at McConnell is essentially confined to the land contained within the CZ/APZ areas. That is because the noise impact area, the outer limit of which is defined by the 65dB noise contour, is almost completely contained within these boundaries. There are, however, two small exceptions to this statement where the noise contour area extends beyond the APZ boundary, as illustrated in Figure 10, but no existing conflicts have been identified in these areas.

A number of land use conflicts presently exist within the CZ and APZ areas based on the recommended LUCG standards. The majority of these conflicts are located in the zones at the north end of the runway, and a few exist in the southern zones as well. In APZ-II-N there are in excess of 1,900 dwelling units at higher densities, which are highlighted in Figure 10. The majority of these units are single-family dwellings (approximately 1,130 units). The remainder are comprised of approximately 180 two to four unit structures, and over 600 apartments located in four complexes. Although the LUCGs indicate that single-family dwellings are acceptable in this zone, it is recommended that the density not exceed one to two dwellings per acre, a threshold that is exceeded by the existing developments. There are several other residential, commercial, and public land uses located in APZ-II-N that also conflict with LUCG recommendations. These include two hotels and an elementary school.

Along with the safety issues related to the existing land uses noted above, a portion of these structures are also susceptible to noise impacts as well. Many of the residential dwellings, as well as the school, are located within the 65-69dB noise contour and as such, should have noise reduction measures incorporated into their construction, a status that is presumed not to exist since local building codes do not mandate such measures.

The APZ-I-N zone also has conflicting residential land uses, although considerably less than in the APZ-II-N zone. Approximately 30 single-family dwellings and 150 apartment units are located in this area, as illustrated in Figure 10. All dwelling units are considered to be conflicting uses in this zone, based on LUCG standards. There is a nursing home located in this area as well, which is also considered to be an incompatible use.

The northern Clear Zone also contains an incompatible land use that is an industrial facility owned by the Cessna Aircraft Company. LUCG standards recommend that virtually no structures of any type be located within the CZ areas.

The southern APZ areas are considerably less developed at this time and as a result, have fewer existing land use conflicts in comparison to the northern zones. There are no conflicting land uses in the southern CZ since all of this land is federally owned.

In APZ-I-S, there is a manufactured housing park with approximately 45 dwellings that is considered to be a conflicting land use in this zone. This development is located on highway K-15, as illustrated in Figure 10. Some of these units are also located within the noise contour interval 65-69dB impact area, which contributes to their incompatibility

given the lack of noise reduction measures within the dwellings. No other conflicting uses were identified in this area.

There were no conflicting land uses identified within the southern APZ-II area. Although there are approximately 40 dwelling units, as well as 20 commercial establishments, the types of uses and the densities (number of units per acre) at which they were developed appear to fall within the standards recommended under the Land Use Compatibility Guidelines.

7.2 Airport Conflicts

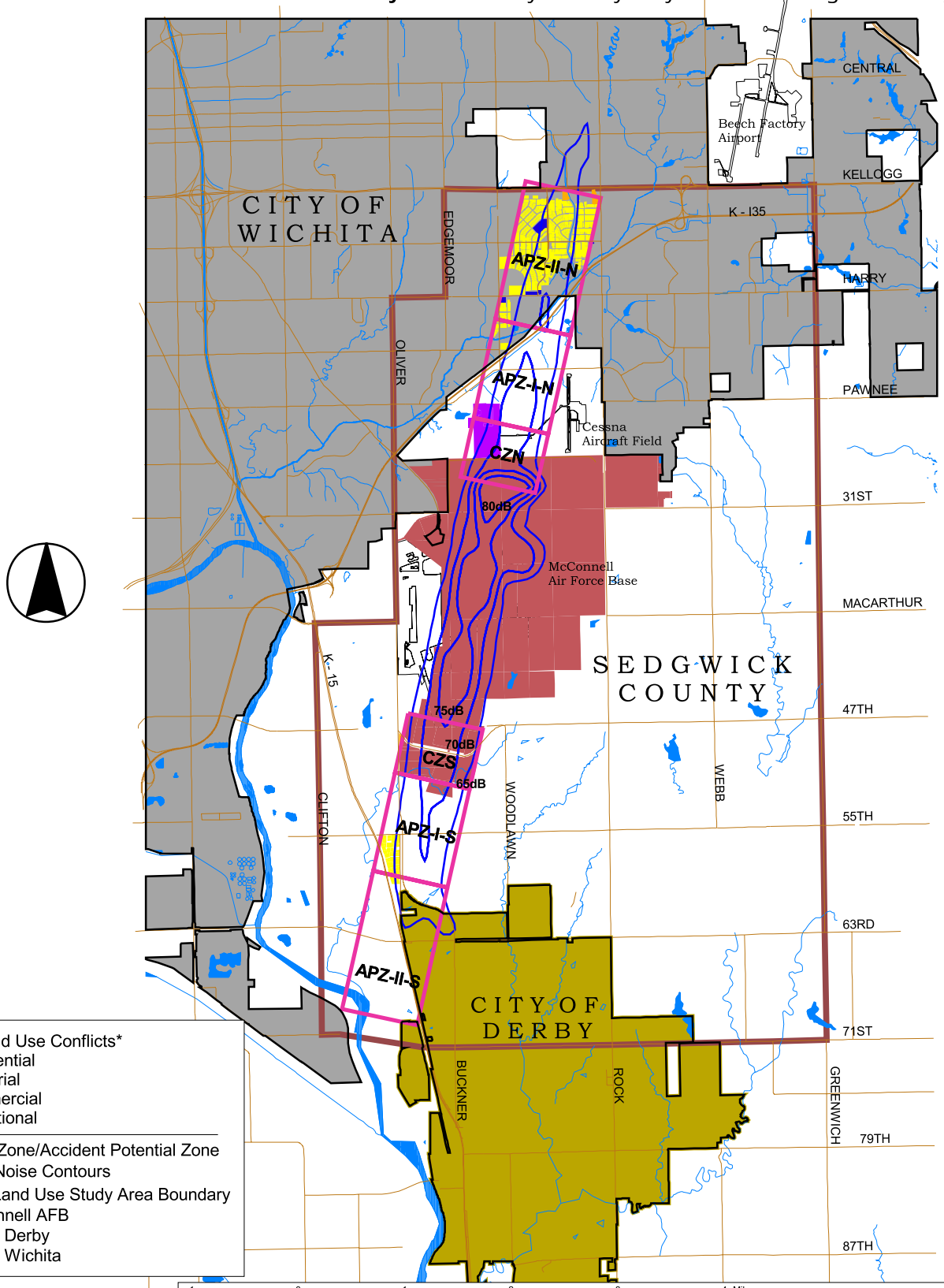
Coordination efforts and formal agreements have been enacted between McConnell Air Force Base Air Traffic Control (ATC) and the ATC facilities in the Wichita area. These agreements accommodate the Air Force mission while providing a safe and efficient separation of air traffic with minimal impact to civil aircraft operations. No operational restrictions on Air Force flight activity have been imposed due to other airports, their development, or flight activity. There currently are no airspace conflicts, nor have there been any unresolved airspace conflicts with previous Air Force missions.

Each civil airport's specific role in the region is expected to remain unchanged. Wichita Mid-Continent Airport serves air carrier and cargo needs while Colonel James Jabara and Beech Factory Airports meet the needs of the general aviation community. McConnell Air Force Base serves the needs of the Air Force mission. In addition, the non-military airports are expected to experience low to moderate growth in use activity. The variable in the total mix of aviation activity in the Wichita area is the potential change in the Air Force mission or level of flight activity at McConnell. Significant changes in either the mission or level of military flight activity could necessitate further air traffic coordination to ensure the ability for the Air Force to maintain its mission.

Existing Land Use Conflicts

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



*NOTE: Land use conflicts are based on the federal Land Use Compatibility Guidelines (LUCG) referenced in the JLUS report.

Prepared by RKG Associates, Inc. - May 2005
Source: Sedgwick County Appraiser's Office; 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure 10

CHAPTER IV
POTENTIAL FUTURE CONFLICTS AROUND MCCONNELL AFB

One of the objectives of this JLUS analysis is to identify future land use conflicts that could affect either the existing mission or maximum mission capability of McConnell AFB. In order to assess the potential for future land use conflicts it was necessary to estimate future growth levels within the Study Area. This portion of the report first discusses the methodology used to project the amount of growth that could reasonably be expected to occur within the foreseeable planning horizon. This is followed by an evaluation of how this growth could potentially result in conflicts that could affect continuing operations at McConnell.

1. GROWTH PROJECTION METHODOLOGY

The methodology used to estimate growth in the impact areas considered for this JLUS is based on research conducted by the Metropolitan Area Planning Department (MAPD) as part of its regional transportation model development. This model divides the Sedgwick County Metropolitan Area into approximately 880 Traffic Analysis Zones (TAZ) which are smaller levels of geography roughly the size of census tracts. Growth projections allocated to each TAZ are used to estimate the number of vehicle trips that will emanate from each zone that serves to support long-term planning for transportation facilities. Growth projections for the model, which extend to the year 2030, are first established at the countywide level. These projections were most recently updated in 2004 by the Center for Economic Development and Business Research (CEDBR) at Wichita State University (WSU).[21] The projections are comprised of population and employment estimates.

These regional projections were then allocated to smaller levels of geography beginning with Statistical Development Areas (SDA) and small cities, such as Derby, within the county. The SDAs are planning areas used by the MAPD to monitor growth trends within and adjacent to, the City of Wichita's urbanized area. The county is divided into 11 SDAs, three of which intersect within the Joint Land Use Study Area (South, East, and Central Southeast SDAs), suggesting that the Study Area is situated at a geographical transitional point within the county from a socio-economic development perspective. It is interesting to note that the MAPD is considering revising the boundaries of some of the SDAs due to the way development patterns have occurred and been influenced by the existence of nearby small

[21] *Addendum to Population and Employment Forecast, Sedgwick County, Kansas 2000-2030,* by Harrah and Townsend, CEDBR, WSU, January 2004.

cities, such as Derby. These sub-county projections are then allocated to each of the TAZ areas based on a number of factors including historical development patterns, the amount of developable land, the availability of services (i.e. water, sewer, roadways), as well as a reliance on existing planning policies that are intent on directing growth to specific locations. There are approximately 100 TAZs that comprise the land area located within the JLUSA and 1994 Noise Contour Area.

The traffic model projections for each TAZ provide an estimate of both the increase in dwelling units and the number of employees that are expected to occur between 2000 and 2030. For purposes of estimating future residential land use conflicts, the number of projected dwelling units were used in conjunction with existing zoning densities to illustrate potential land use conflicts that could occur, based on the Land Use Compatibility Guidelines for development around military installations, which are described later in this report.

Employment projections for each TAZ were used to estimate the amount of non-residential development that could occur within the Study Area throughout the forecast period. These employment projections were converted into estimates of future building space using multipliers representing industry averages of square footage per employee, which were derived from several sources including the Urban Land Institute (ULI), the Institute of Traffic Engineers (ITE), and the U.S. Department of Energy (DOE). Since the model's employment projections are presented at a relatively general level of industrial classification (i.e. retail versus non-retail) it necessitated the use of multipliers that were at a correspondingly generalized level. The estimates of demand for future non-residential building space were used in conjunction with existing zoning regulations to estimate the potential for future conflicts related to continuing operations at McConnell AFB. It should be pointed out that the employment projections are supported by an underlying assumption that population growth will occur at sufficient levels to provide enough people to fill the jobs being created. Therefore, if the population grows at a slower rate it may reduce the total growth in projected jobs.

The estimates of existing and projected development presented in the following sections are derived from different data sources, which include the MAPD's traffic model as well as the Sedgwick County Appraiser's Office property database. These data sources represent a combination of actual real property information for valuation purposes; estimates of dwelling units and employment, based on a regional model; and, projected growth, based on historical trends and economic and social indicators. Because the data is derived from several different sources, there are instances where some of the base estimates for a given year will not match exactly. These discrepancies should not be construed as an error in the data nor does it necessarily reflect inaccuracies in the underlying methods used to arrive at those estimates. Another cause for any such differences is the fact that TAZ boundaries do not always coincide with the JLUSA boundaries or the AICUZ noise contour boundaries. Therefore, an allocation methodology had to be established, using Geographic Information System (GIS) analysis, to apportion the estimated growth that would occur within these study area boundaries for each partial TAZ area.

2. PROJECTED DEVELOPMENT - JOINT LAND USE STUDY AREA

2.1 Residential Development

The number of residential dwelling units located within the Joint Land Use Study Area is expected to approach 20,000 by the year 2030, based on MAPD estimates. The actual total projected number of dwelling units is approximately 19,920, an increase of 3,080 from the 16,840 that existed in the base year 2000. This represents a growth rate of 18.2% over the 30-year time frame or an average annual growth rate of 0.6%. If distributed equally, this projected growth would result in the addition of approximately 102 dwelling units annually over the next 30 years within the JLUSA. From a countywide perspective, regional housing growth between 2000 and 2030 is projected to occur at a rate of 24.5%, or 0.73% annually during that time period, a somewhat faster rate than anticipated for the JLUSA. Historically the increase in the Study Area's growth rate has been steadily declining over the last 15 years, as illustrated in Table 26, based on housing data from the Sedgwick County Appraiser's Office. In fact, the rate of housing construction during the most recent time period examined (2001-2004) indicated an annual growth rate of 0.78%, which continues this declining trend and apparent movement toward the long-term average annual projected rate of 0.6% for the Study Area, as presented in the traffic model.

Table 26
Dwelling Unit Growth in the JLUSA
1990-2004

Year	Total Units	Avg. Annl Growth Rate	
		Year	Rate
1991	15,236	NA	NA
1995	16,514	1991-95	1.6%
2000	17,404	1996-00	1.0%
2004	17,954	2001-04	0.78%

Source: Sedgwick County Appraiser's Office

It is important to note that the projected levels of growth within the JLUSA are reliant not only on the overall projected growth for the region, but also upon the existing zoning regulations that dictate permitted density levels, as well as other development standards. If these density and development standards are changed at some point in the future, it will necessitate a re-evaluation of the projected levels of growth presented above. The potential impacts of such a scenario are discussed in a subsequent section of this chapter.

2.2 Non-Residential Development

As discussed in the introduction to this chapter, estimates for non-residential development in the JLUSA are based on employment projections developed as part of the regional traffic model for the Sedgwick County metropolitan area. Projections at the county level indicate that total employment by 2030 will be approximately 323,250. This represents an increase of 38% (approximately 89,000 employees) between 2000 and 2030 and an average annual growth rate of 1.07%. The total employment base in the county as of 2000 was comprised of approximately 75% (175,000) non-retail and 25% (60,000) retail jobs. During the 30-year forecast period, retail employment is expected to increase at a faster rate (56.1%) in comparison to non-retail positions (31.8%). However, the number of non-retail jobs added will be greater than the number of retail jobs, with projected increases of 55,716 and 33,238, respectively.

Table 27
Projected Employment Growth in the JLUSA
2000-2030

Type	Total Employment		Change	% Change
	2000	2030		
Non-Retail	17,833	20,961	3,128	17.5%
Retail	5,085	7,641	2,556	50.2%
Total	22,918	28,600	5,682	24.7%

Source: MAPD and RKG Associates, Inc.

Total employment within the JLUSA as of 2000 was estimated at approximately 22,900. Using the regional traffic model projections as a basis for more localized employment growth, it is estimated that total employment within the Study Area will increase by approximately 5,680 as of 2030, a total growth rate of 24.7%, and an average rate of 0.74% annually. Like the county's employment distribution, approximately 78% of the Study Area's jobs are non-retail oriented with 22% in retail related positions. However, non-retail employment in the Study Area is projected to increase by only 17.5% (3,128 jobs) by 2030, whereas the regional growth rate is projected to be almost double that figure at 31.8%. The Study Area's 50.2% (2,556 jobs) projected rate of retail employment growth is however, more comparable to the region's 56.1% estimated growth rate for the forecast period.

While the employment projections presented above are suitable data for input into the regional traffic model, this estimated growth in the number of jobs does not offer a tangible perspective for future land use development within the Study Area. In order to address this issue, multipliers representing average square foot of building space per employee have been applied to employment projections in order to development estimates of potential future non-residential construction within the Study Area. Based on the non-retail multipliers of 350-650 square feet per employee, it is estimated that projected employment growth of 3,128 could result in the demand for between 1.1 and 2.0 million square feet of building space within the Study Area by 2030. Projected retail-related employment growth of 2,556 could result in the demand for approximately 640,000 to 1.3 million square feet of building space (based on 250-500 sq. ft. per employee) during the same time period. This represents a combined total (retail and non-retail) of 1.74 to 3.3 million square of potential building space to accommodate future employment growth. Based on the County Appraiser's real property records as of 2004, approximately 5.2 million square feet of commercial and industrial building space could be *identified* within the Study Area. However, this is considered a low estimate of existing non-residential building space since data for some of the larger and older manufacturing facilities could not be fully reconciled with regard to total building square footage.

As noted in the methodology description presented in the preceding section, these projections of building space represent broad estimates that could vary considerably depending on a variety of factors. One important factor to note is that some portion of the *demand* for future building space referred to above is likely to be accommodated within existing structures that have some available capacity. Or, a portion of this demand could result in expansion of existing structures, versus new construction, which may result in less significant land use impacts within the Study Area. Despite these potential variations, it is evident, based on the projected employment growth, that a significant increase in non-residential development is anticipated over the next 30 years within the JLUSA.

2.3 Land Development Potential

This section examines the development potential, also referred to as build-out capacity, for the remaining undeveloped land within the JLUSA. The analysis of build-out potential was based on existing zoning densities and a range of development levels that were considered reasonable for the Study Area, based on existing regulatory standards. It was not the intent

of this analysis to conduct a comprehensive build-out study, which examines all the potential intricacies of development potential in a given area, such as infill and expansion of existing buildings, as well as an array of development constraints. Rather, for the purpose of this study it was considered suitable to identify the potential magnitude of development that could occur within the JLUSA, based on existing zoning, for comparison with projected growth levels discussed in the preceding sections.

As identified in the chapter related to existing land uses there is approximately 10,000 acres of undeveloped land remaining in the Study Area. Over 9,000 acres of this undeveloped land is currently classified as agricultural property, which may have a minimal amount of existing structures. In addition, a small percentage of this undeveloped land may have already been subdivided, but no housing or other structures have yet to be constructed.

Table 28 presents the undeveloped acreage in the JLUSA by generalized zoning density and types of permitted uses (i.e. residential or non-residential). Residentially zoned land is divided into three density categories: high, 5,000 to 10,000 square feet per dwelling; medium, 10,000 to 20,000 square feet per dwelling; and low, two to four acres per dwelling. The remaining high density acreage totals only 819 acres but, given the availability of municipal water and sewer systems, could still potentially accommodate between 3,000 and 6,000 additional dwelling units.[22] This estimate assumes that all of the available land will be used for residential purposes when in fact, a portion of it is likely to be used for commercial or other non-residential land uses.

Table 28
Undeveloped Acreage and Development Potential for JLUSA

Zoning	Undeveloped Acreage	Low Est.	High Est.
		Potential Addtl. Dwelling Units	
Residential			
High Density	819	3,034	6,067
Medium Density	3,428	4,231	6,346
Low Density	5,002	1,064	2,129
Total Residential	9,249	8,329	14,542
		Potential Addtl. Building Sq. Ft.	
Non-Residential	772	3,429,200	5,143,800

Source: Wichita GIS Services and RKG Associates, Inc.

Undeveloped land for medium density housing totals approximately 3,430 acres, which would potentially allow for the construction of between 4,230 and 6,350 additional dwelling units, based on an average of 10,000 to 20,000 sq. ft. per dwelling. This density of development would require the availability of municipal water and sewer, which is not presently extended to all portions of these zoning districts. Therefore, build-out in these areas could be less than estimated if utility lines are not extended prior to development.

[22] Note: The residential build-out estimates were arrived at by taking the undeveloped acreage in each residential zoning category and deducting 15% to allow for road/utility construction and other development constraints. The remaining amount was then divided by the low and high density averages noted in the text. For example, the undeveloped high density acreage of 819 was reduced by 15% to 696, which was then divided by 10,000 and 5,000 acres respectively, to arrive at the potential estimate of low and high build-out for those zoning districts.

Low density zoning districts have the largest amount of undeveloped land remaining with approximately 5,000 acres. However, with minimum densities ranging between two and four acres per dwelling, the potential additional units that could be constructed in these areas ranges from 1,064 to 2,129.

Based on the aforementioned methodology and assumptions, the total potential dwellings that could be constructed in the JLUSA range from approximately 8,330 to 14,540. In comparison, projected residential development by 2030 is expected to result in the creation of an additional 3,080 dwellings.

The potential for non-residential development within the JLUSA was estimated using a similar method. However, instead of applying a minimum lot size based on zoning, a floor area ratio (FAR)[23] multiplier was used, which is a typical standard for measuring the amount of non-residential building space located on a parcel of land. The FAR of a commercial or industrial parcel can vary significantly based on development regulations and the type of use. However, a FAR range of 0.12 to 0.18 was considered to be a reasonable range to accommodate the average type of development that might be constructed in the Study Area.

Based on these assumptions, it is estimated that approximately 3.4 to 5.1 million square feet of additional non-residential building space could be accommodated on the remaining 772 acres of undeveloped land within the Study Area. The projected amount of non-residential development expected to occur by 2030 ranges between 1.7 and 3.3 million square feet of building space.

3. POTENTIAL IMPACTS OF DEVELOPMENT ON THE EXISTING MISSION

This section examines the projected growth levels within the 2004 Noise Contour Area, Clear Zones (CZ) and Accident Potential Zones (APZ) and identifies potential conflicts with potential future development based on existing zoning. The noise contour areas, combined with the CZ and APZ areas, are referred to collectively as the existing mission impact area.

3.1 Residential Development

The amount of future residential development expected to occur within the existing mission impact area is relatively small. There are several reasons for this expectation. First, is that the 2004 noise contours contain a relatively small amount of land area, approximately 2,515 acres. Of that total, 50% of the land area is contained within the boundaries of McConnell AFB and thus, represents no potential conflicts with regard to future development. Second, no dwelling units have been constructed within the 2004 Noise Contour Area since 1991, according to Sedgwick County real estate records. Only three dwelling units have been constructed within the APZ areas over the last 10 years, and none in the Clear Zones since the initiation of local zoning regulations designed to minimize development impacts in these areas. Finally, the relatively small amount of undeveloped

[23] A floor area ratio (FAR) represents the percentage of building space in relation to the lot area on which it is located. For example, a 10,000 sq. ft. building located on a 100,000 sq. ft. lot would have an FAR of 0.10.

land remaining in the existing mission impact area, combined with the low rate of historical residential development, suggests that future development levels will be low as well.

An estimated 754 dwelling units currently exist within the footprint of the 2004 contours, almost all of which are located north of McConnell in the City of Wichita. As of 2004, it was estimated that approximately 2,030 dwelling units existed within the APZ areas, the vast majority of which are also located in the zones north of McConnell. Future residential development in these areas, based on projections developed for the regional traffic model, anticipate that no additional dwelling units will be constructed within the 2004 Noise Contour Areas and only 10 units within the APZ areas, during the forecast period of 2000 to 2030. Although it is likely that actual growth in these areas will be somewhat higher than these estimates, the total number of dwellings is expected to be relatively low in comparison to the remainder of the JLUSA.

3.2 Non-Residential Development

Projected employment growth within the existing mission area is also expected to be relatively modest, given the limited amount of land area, in comparison to the JLUSA and region as a whole. Total employment within the Noise Contour Areas as of 2000 was estimated at 3,773, and 2,964 in the 2004 Noise Contours and APZ areas, respectively, as illustrated in Table 29 (Note: Some portion of these totals represents the same jobs, since the contours and APZ areas overlap to a great degree and therefore, the totals should not be combined). By 2030, employment within the contour areas is projected to increase by approximately 200, or 5.5%. This additional employment is expected to be relatively equally distributed between retail and non-retail jobs.

Projected employment in the APZ areas is estimated to be somewhat higher, due in large part to estimates of growth for one TAZ in the southern APZ–II, which lies outside the contour boundary along highway K-15. Total employment in the APZ areas is expected to increase by approximately 560 over the next 30 years, an 18.8% increase over the 2000 employment levels of 2,964.

Table 29
Projected Employment Growth in the 2004 Existing Mission Area (2000 - 2030)

Type	Total Employment 2000	Total Employment 2030	Change	% Change
	2004 Noise Contour Areas			
Non-Retail	2,243	2,354	111	4.9%
Retail	1,530	1,627	97	6.3%
Total	3,773	3,981	208	5.5%
	Accident Potential Zones (APZ)			
Non-Retail	1,657	1,904	247	14.9%
Retail	1,306	1,617	311	23.8%
Total	2,964	3,522	558	18.8%

Source: MAPD and RKG Associates, Inc.

Using the same methodology described previously, average building square foot multipliers were applied to projected employment levels to arrive at estimates of potential non-residential building development within the 2004 mission impact area. Within the 2004 Noise Contour Area the projected employment growth would represent a demand for an additional 63,100 to 120,650 square feet of building space. In the APZ areas the estimated demand would range between approximately 164,000 and 316,000 square feet of space. Although some portion of this projected demand for non-residential building space may result in new construction, or the expansion of existing structures, most of this type of growth will be accommodated

within existing establishments. This is due to the fact that there is a limited amount of appropriately zoned undeveloped land remaining within the existing mission impact area.

3.3 Airport-Related Development

With regard to airport-related development and the impact that growth will have on the existing aviation relate uses, civil airport forecasts indicates moderate growth and therefore no significant impacts or conflicts are anticipated. Military forecasts are not generally prepared as part of military airfield planning, so the most conservative approach to protecting land use would be to compare existing aviation activity with the 1994 AICUZ study. This scenario is referred to as maximum mission capability. The noise impacts associated with maximum mission capability can be estimated by determining the capability of McConnell to accommodate more or different types of activity that would affect a larger surrounding area. This concept, with regard to potential impacts on development, is discussed in more detail in a subsequent section of this chapter. However, potential noise impacts to the land uses around McConnell could change with an increase in the number and/or types of aircraft located at McConnell AFB.

As noted previously, the aviation activity in the region is strong and diverse. Two of the area's airports –Colonel James Jabara and Beech Factory Airports – are in close proximity to McConnell and therefore could have the greatest impact on the facility. Growth projections were completed as part of the master planning process for Colonel James Jabara Airport. Raytheon provided information regarding general assumptions for the anticipated aviation usage of the Beech Factory Airport. Table 30 summarizes the projected activity for these civil airports, which must coordinate airspace utilization and air traffic control around McConnell Air Force Base.

Table 30
Projected Aviation Activity Summary for Civil Airports

Beech Factory Airport	**Base Year**	**2008**	**2013**	**2023**
Annual Operations	32,000	32,000	32,000	32,000
Based Aircraft	77	80	80	80

Colonel James Jabara Airport	**Base Year**	**2008**	**2013**	**2023**
Annual Operations	38,700	44,200	49,000	60,500
Based Aircraft	153	170	185	220
Annual Instrument Approaches	526	620	710	980

Sources: Executive Summary for the Master Plan for Colonel James Jabara Airport; www.airnav.com; Beech Factory Airport Tower Manager, December 2004.

The projection of aviation activity is normally completed in conjunction with civil airport master planning or noise study efforts. However, it is generally not part of data collection for the military equivalent, the AICUZ study. Therefore, documented projections are not available for a comparison to the civil airports in the region. This is partly because a change in mission at a military facility could result in significantly more airport operations or a completely different fleet mix of potentially larger aircraft. Although this type of change can be quickly implemented by the Air Force when a reallocation of resources or mission assignment occurs, rapid changes are not typical at civil general aviation airports,

such as Jabara and Beech Factory Airports. Typically, significant improvements or facility upgrades, such as runway extensions or terminal buildings, would be needed if commercial or heavy air cargo aircraft operations were to initiate service at an average general aviation airport. Based on existing forecasts, it is expected that the general roles of the airports in the immediate vicinity of McConnell will remain unchanged.

Through on-going coordination between McConnell Air Force Base and the surrounding airports, flight operations associated with Air Force activity have been accepted as a factor that local civil aircraft operators and controllers need to incorporate into their air traffic control policies. Consequently, possible growth in aircraft flight activity at the civil aviation facilities is not anticipated to create conflict with the flight activities at McConnell Air Force Base. Although the proximity of the facilities is relatively close, the segregation and safe separation of aircraft has been maintained over the years under varying civil and military traffic levels and types. It is expected that policies, standard piloting and air traffic control practices will continue to guide and regulate the flight activity in the vicinity of McConnell.

As previously noted changes in the mission at McConnell could significantly alter flight activity at the facility. Flight activity in the past, when the prevalent aircraft was the B-1, created significantly larger noise contours due to a much louder aircraft. The noise generated from a single operation of the B-1 impacts a much greater area than that of the C-12 or KC-135, which are currently flown at the Base. Since noise exposure is a function of the number of flights and types of aircraft that are flown, it is reasonable to expect that a dramatic increase in the number of flight operations with the existing aircraft could occur before the noise contours would increase to encompass the same area that was affected when the B-1 was the primary aircraft. According to the 1994 AICUZ, approximately 17,770 acres of land were exposed to noise levels of DNL 65dB or higher. Based on the 2004 AICUZ, it is estimated that approximately 2,510 acres were affected by noise levels of 65dB or higher.

Additional assumptions can be made about the capacity that is available for growth at McConnell Air Force Base. Standard planning practices established by the Federal Aviation Administration indicate that for parallel runway airfield configuration, such as McConnell, the Annual Service Volume (ASV) could vary between 260,000 and 370,000 annual operations. ASV is a complex calculation that includes aircraft fleet mix, weather conditions, runway use patterns, percent of touch and go operations, and various other inputs to determine the maximum number of operations that can be conducted at an airport before delays must be taken. Approximately 70,058 operations occurred at McConnell between August 2002 and July 2003[24]. Therefore, current activity represents only a fraction of the airfield's maximum capacity, and a large increase in operations could occur without creating congestion. The likelihood of reaching this ASV is dependent on the military mission.

Based on these assumptions, it can be concluded that increases in aircraft operations and introduction of louder aircraft operating at McConnell would likely create a higher level of

[24] McConnell Air Force Base AICUZ Study, 2004.

noise impact that could be similar to those experienced when the B-1 was operating at McConnell.

3.4 Potential Land Use Development Conflicts

The potential for future development to conflict with operations of the existing mission at McConnell is primarily a function of the land use regulations (e.g. zoning, subdivision regulations, and building codes) that are applied to the remaining undeveloped land within the 2004 mission impact area. There are approximately 390 acres of undeveloped land within the 2004 Noise Contour Areas and 740 acres within the CZ/APZ areas (refer to Figure 11). Some of this acreage in the two areas represents the same undeveloped parcels and therefore, the totals should not be combined.

There are two primary types of potential impacts associated with adjoining land development and operations of aircraft at McConnell. The first is related to noise impacts within structures that are located within the impact area delineated by the 2004 Noise Contour Areas. Regular exposure to noise levels greater than DNL 65dB is considered potentially harmful for a variety of types of land uses, which are identified in the Land Use Compatibility Guidelines (LUCG), summarized in the Appendix. The second potential type of conflict is related to safety considerations associated with accidents during take off and landing of aircraft. In order to minimize these types of potential hazards, clear zones and accident potential zones are delineated at the ends of either runway. Once again, the LUCGs provide recommended types of land uses that are considered suitable within these safety zones.

Table 31
Undeveloped Acreage by Zoning District

Zoning District	CZ/APZ Areas	2004 Contours
B-2*	0	0.7
B-3*	8.7	11.9
B-5*	52.8	34.9
GC	80.8	45.2
GO	0.7	0
LC	16.1	11.7
LI	2.8	0
NR	2.3	0
RR	533.1	281.0
SF-20	31.0	4.4
SF-5	9.4	3.9
Total	737.6	393.7

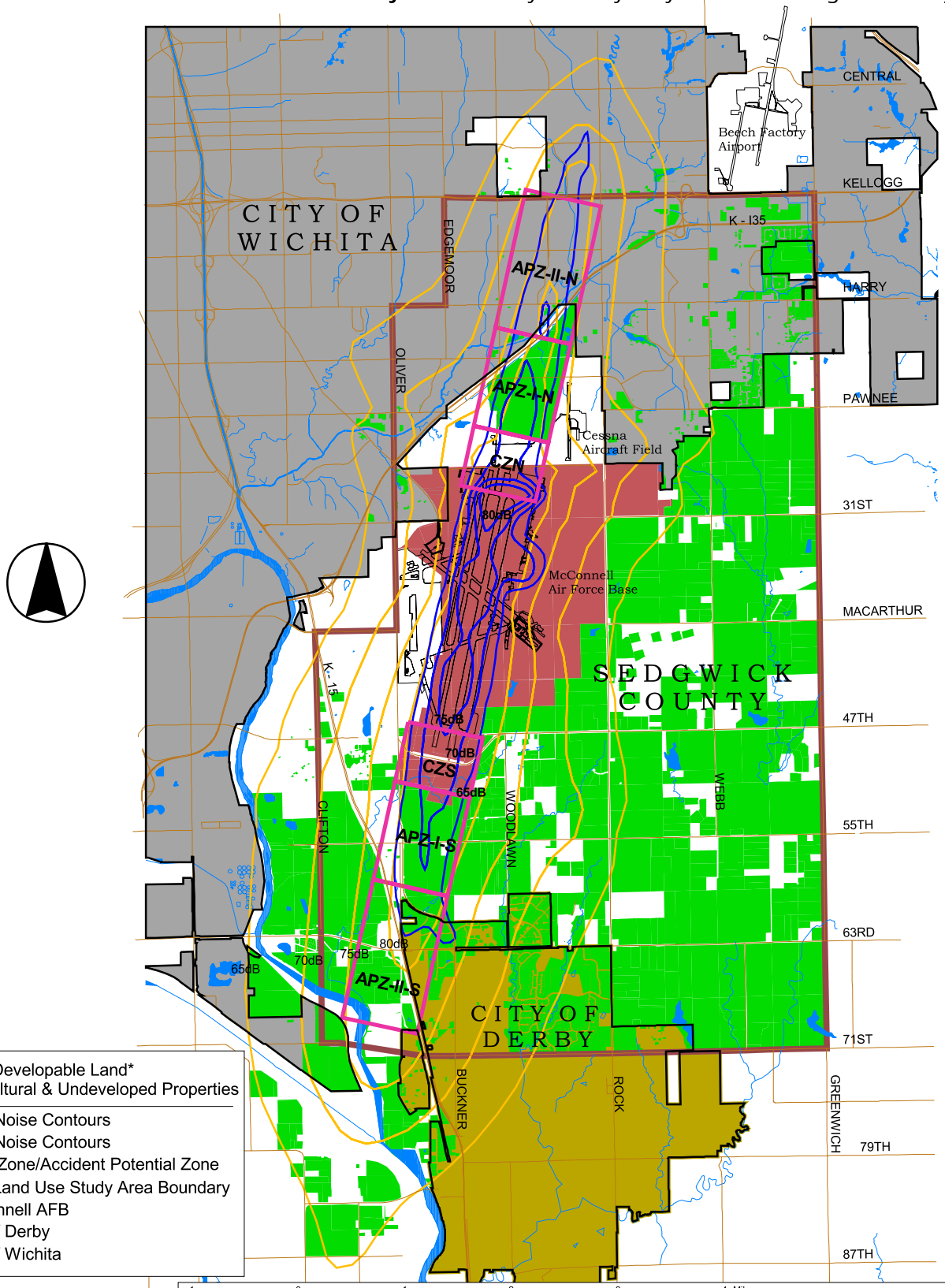
*Denotes districts located in Derby. All other districts in Wichita/Sedgwick County.
Source: Sedgwick County Appraiser's Office and RKG Associates, Inc.

The remaining undeveloped acreage in the 2004 mission impact area lies within approximately 10 different zoning districts situated in the City of Wichita, Sedgwick County, and the City of Derby. However, with the exception of a few locations, most acreage within each of the districts totals less than 10 acres and therefore, is considered relatively inconsequential with regard to future potential development impacts. The districts that do have significant remaining undeveloped acreage include the RR, GC, B-5, and SF-20 districts, as illustrated in Table 31. It should also be noted that Cessna Aircraft Company owns approximately 340 acres of land at the north end of the runways (in the CZ and APZ-I) that is not reflected in Table 31 because it contains existing structures. However, this land area, which is zoned Light Industrial (LI), is essentially undeveloped and therefore, does offer the potential for future development conflicts. It should also be noted that 90 acres of the 340 acres owned by Cessna are currently protected by a perpetual easement that restricts future development potential.

Potentially Developable Land

McConnell Air Force Base Joint Land Use Study

City of Derby - City of Wichita - Sedgwick County



*NOTE: Some areas identified in this Figure as undeveloped may already be subdivided but did not have any structures recorded in the County's property tax records.

Prepared by RKG Associates, Inc. - May 2005
Source: Sedgwick County Appraiser's Office; 2004 AICUZ Study, McConnell AFB; and Wichita GIS Services

Figure 11

For the zoning districts located in the City of Wichita and Sedgwick County, the regulations of the base districts listed in the Table are superseded by requirements of the Airport Overlay (A-O) district, which encompasses all land within the CZ and APZ areas. The A-O district is divided into three subdistricts that correspond to the Clear Zones and APZs I and II. For the most part, the A-O district minimizes or eliminates most conflicts with Base activities as recommended in the LUCGs; however, there are a few exceptions that should be addressed. One issue is that within the Clear Zone areas the A-O regulations permit the establishment of some major types of land use activities that are not considered compatible with LUCG recommendations. These include concrete and asphalt plants, wholesale businesses, and warehouses. This is only an issue for the northern Clear Zone area since land within the southern CZ is federally owned. It is generally recommended that no structures be permitted within any portion of the CZ areas.

Other areas of apparent minor conflict between the A-O regulations and the LUCGs are related to residential uses. The A-O regulations permit low-density residential uses in the APZ-I area where the LUCGs recommend no residential uses. In the APZ-II area, the A-O allows high-density residential uses where only low-density is recommended in the LUCGs.

One final issue related to the A-O requirements is that they do not address noise impacts within the area delineated by the 2004 Noise Contour Areas. For many of the land uses that are considered compatible within the APZ or noise contour areas, based on LUCGs, it is recommended that noise level reduction (NLR) measures be implemented for buildings, or portions of buildings, that are occupied. The A-O regulations do not address this issue, nor do any other regulations or codes currently enacted by the City of Wichita or Sedgwick County.

Within the City of Derby, the primary zoning district that is affected by the 2004 mission impact area is the B-5 district. This district lies within the southern APZ-II area and has approximately 50 acres of undeveloped land available, although this estimate may be even lower based on recently approved, or as yet, unbuilt developments. The standards for this district were structured to specifically address potential conflicts with Base activities and therefore, appear to be largely compliant with the recommended LUCGs for land uses within the APZ-II area.

3.5 Land Use and Air Hazard Regulations

There are three general types of regulations that help protect the aviation assets of an airport or mitigate noise due to aviation activity. They include:

- Land use or development controls
- Building code changes for specific sound attenuation measures for new construction or substantial remodeling, and
- Acoustical treatment of existing structures.

Two types of land use controls are currently in place within the Sedgwick County and the Cities of Wichita and Derby: height/hazard zoning and AICUZ –compatible zoning, which is based on the LUCGs. The land use or development controls that promote compatible

land use while providing a safe flying environment are height hazard, and overlay zoning. Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, generally provides for the identification of obstructions to protect the areas used for takeoffs or landings of aircraft. The City of Wichita Airport Hazard Zoning Code, which restricts construction that would create obstructions, is based on FAR Part 77. Since many obstructions are not normally located on property owned by an airport, it becomes the airport sponsor's responsibility to coordinate with the local jurisdictions for coordination and marking or removal of the obstructions.

The AICUZ compatible zoning, which relies on the recommended standards provided in the LUCGs, refers to the Airport Overlay (A-O) and B-5 zoning district standards that restrict incompatible land uses in areas correlated to the APZs and CZs. However, if a noise contour extends beyond an APZ as defined in the AICUZ (and consequently as defined in the A-O district), then areas exposed to noise levels in excess of DNL 65dB would not be governed by these guidelines and standards and could be subject to further regulatory action.

If incompatible land uses are developed within noise impacted areas then additional measures, such as specific construction standards to reduce interior noise, can be put in place to help mitigate the impact. The Cities of Wichita and Derby, as well as Sedgwick County, do not have a comprehensive noise mitigation plan in place to address solutions that would reduce noise around airports or provides funding for such improvements. A plan, such as an FAR Part 150 *Noise Compatibility Study* is a voluntary study that provides a mechanism under which requirements and/or funding could be made available for potential mitigation measures at civil airports. This type of study however, would not provide benefits for sensitive land uses affected by military airport noise.

Noise mitigation measures must be considered carefully, based on the level of noise impact, the type of land use (i.e. residential compared to commercial or industrial) as well as the feasibility for implementation of a program. Existing residential areas north of McConnell Air Force Base that are exposed to DNL 65dB or higher would generally be candidates for sound insulation under a FAR Part 150-type program. However, south of McConnell, in Derby, there is very little existing incompatible development. In this case, the city could specify noise reduction requirements for new construction or substantial reconstruction. Derby could also adopt community standards that could limit development within certain noise impact zones to compatible types of development. One challenge with a measure such as this is that pressure from landowners and developers to pursue low cost, high yield developments can make it difficult for cities to adhere to strict development standards. Development opportunities should be able to be pursued if they are reasonable and compatible with the noise impacts that could result from a Maximum Mission Capability scenario. Regulations that control or restrict development require developers to absorb the capital costs and pass them onto buyers or tenants. Retroactive sound insulation programs are generally more expensive and require the municipality to finance the costs associated with noise reduction. This is rarely done without federal financial assistance. Building construction standards to address noise attenuation in order to minimize potential

impacts in the areas affected by either the existing mission or maximum mission capability are discussed in Chapter II of this report.

4. POTENTIAL IMPACTS OF DEVELOPMENT ON MAXIMUM MISSION CAPABILITY

This section examines the projected growth levels within the 1994 noise contours (CZ/APZ areas discussed under current mission) and identifies potential conflicts based on existing zoning and possible future land use plans

4.1 Residential Development

Future residential development within the 1994 Noise Contour Area, based on traffic model projections, is anticipated to occur at a considerably slower rate than experienced over the last decade. Residential development in the traffic analysis zones (TAZ) affected by the noise contours will increase from an estimated 16,838 to 17,359 dwelling units between 2000 and 2030, an increase of 521 dwelling units. This represents a 3% growth rate over the forecast period or an average annual rate of 0.1% per year. This is a considerably slower growth rate than the 0.74% projected for the JLUSA during this time period, which indicates that the majority of the growth around McConnell is expected to occur in portions of the Study Area outside the 1994 Noise Contour Area. In fact, historical residential growth within the noise contours has been decreasing over the last decade and a half, as revealed in the existing land use analysis portion of this report. The number of residential dwellings constructed between 1990 and 2004 was approximately 1,200. As illustrated in Table 32, the average annual rate of increase has declined significantly during this time period and most recently has averaged 0.2% between 2000 and 2004.

Table 32
Dwelling Unit Growth in the 1994 Noise Contour Area between 1990-2004

Year	Total Units	Avg. Annual Growth Rate	
1991	17,007	NA	NA
1995	17,693	1991-95	0.79%
2000	18,071	1996-00	0.4%
2004	18,216	2001-04	0.2%

Source: Sedgwick County Appraiser's Office

The declining historical growth rates seem to support the lower future rate of residential development anticipated in the traffic model projections within the 1994 Noise Contour Area over the forecast period. *However, one factor that could change this scenario is future residential development within the JLUSA boundaries outside the contours. As noted previously, it is projected that over 3,000 additional dwelling units will be constructed in the Study Area over the next several decades. As new subdivisions are constructed along Rock Road, Webb Road or 63rd Street for example, the construction of these subdivision roads will have the potential to increase access to previously inaccessible land within the noise contour area. If this occurs, it will alter one of the major assumptions on which the traffic model projections were based, which is that the lack of roadway access and municipal utilities tends to result in a lower rate of growth. In other words, historical growth rates, as well as land planning policies may not necessarily preclude residential development within the 1994 Noise Contour Area if market forces and land development patterns create pressure to make this land available for residential uses.*

4.2 Non-Residential Development

Total employment in the 1994 Noise Contour Area is projected to increase by approximately 3,400 between 2000 and 2030, based on the regional traffic model forecast. This represents a growth rate of 11.2% and an average annual increase of 0.35% during this time period. This rate of growth is less than half the projected rate of growth anticipated for the JLUSA as a whole, which, similar to the residential projections discussed above, indicates that more non-residential growth is expected to occur outside of the contour areas within the Study Area boundary.

As illustrated in Table 33, retail employment is expected to increase at a somewhat faster rate than non-retail employment with growth rates of 13% and 10.5%, respectively. However, non-retail sectors are expected to add approximately 1,100 more jobs than retail sector establishments overall during this time period.

From a land use perspective, projected non-retail employment could represent a demand for approximately 800,000 to 1.5 million square feet of building space. Retail related employment increases could create a demand for approximately 285,000 to 570,000 square feet of space for a combined total of 1.0 to 2.0 million square feet of non-residential building space. As pointed out previously, it is anticipated that some portion of the projected growth in total employment will be absorbed into available capacity within existing buildings or through the expansion of existing development. Therefore, it is unlikely that the demand for non-residential building space identified above will result in the construction of new development totaling 1.0 to 2.0 million square feet of building space within the 1994 Noise Contour Area.

Table 33
Projected Employment Growth in the 1994 Noise Contour Area 2000-2030

Type	Total Employment 2000	Total Employment 2030	Change	% Change
Non-Retail	21,917	24,211	2,294	10.5%
Retail	8,730	9,869	1,139	13.0%
Total	30,647	34,080	3,433	11.2%

Source: MAPD and RKG Associates, Inc.

4.3 Potential Land Use Development Conflicts

As discussed earlier, there are two primary types of potential impacts associated with adjoining land development and operations of aircraft at McConnell. The first are related to noise impacts and the second to safety/accident considerations during take offs and landings of aircraft. The latter issue is associated with the Clear Zones and Accident Potential Zones located at both ends of the runways. This impact area is the same for both the existing mission (2004) and the maximum mission capability (1994) and has already been addressed in a previous section of this report.

The types of impacts related to noise are also similar with regard to all missions McConnell may be involved in, however, the land area potentially impacted under the maximum mission scenario is considerably larger. Regular exposure to noise levels greater than DNL 65dB is considered to be potentially harmful for a variety of different land uses that are identified in the Land Use Compatibility Guidelines (LUCG) that are summarized in the Appendix. The potential for future development to conflict with operations of the maximum mission at McConnell is primarily a function of the land use regulations (e.g.

zoning, subdivision regulations, and building codes) that are applied to the remaining undeveloped land within the maximum mission capability impact area as defined by the 1994 Noise Contour footprint. There is approximately 4,900 acres of undeveloped land, the majority of which is presently used for agricultural purposes, within the 1994 Noise Contour Areas, as illustrated in Table 34 and Figure 11. Approximately 4,400 acres are zoned primarily for residential uses and 480 acres for non-residential uses although, in many locations, the zoning regulations allow for a mixture of both types of land uses within each zoning district.

The full development potential, or complete build-out of the undeveloped acreage remaining in the maximum mission capability impact area, is summarized in Table 34. As illustrated, an estimated 4,770 to 8,560 additional dwelling units could be constructed on the undeveloped, residentially zoned land within the 1994 Noise Contour Area, based on average densities discussed previously in this report. According to the standards prescribed in the LUCGs, all residential development in this area should be discouraged. However, if it is determined by the community that residential development is necessary in areas with noise exposure between DNL 65dB and 74dB, then NLR measures should be implemented. For areas with noise exposure greater that 75dB, LUCGs recommend no residential development under any circumstances. There is approximately 1,375 acres (31%) of undeveloped land that falls into this latter category within the 1994 Noise Contour Area.

Table 34
Undeveloped Acreage and Development Potential for 1994 Noise Contour Area

Zoning	Undeveloped Acreage	Potential Addtl. Dwelling Units	
		Low	High
Residential			
High Density	630	2,333	4,665
Medium Density	1,602	1,977	2,966
Low Density	2,180	464	928
Total Residential	4,412	4,774	8,559
		Potential Addtl. Building Sq. Ft.	
Non-Residential	483	2,146,027	3,219,040

Source: Sedgwick County Appraiser's Office, Wichita GIS Services and RKG Associates, Inc.

The potential for additional non-residential development within the 1994 Noise Contour Area is estimated to range between approximately 2.1 and 3.2 million square feet of building space at full build-out (refer to Table 34). Non-residential development within this noise impact area represents the potential for fewer land use conflicts, based on LUCG standards. This is particularly true for commercial and industrial uses although public and quasi-public uses are considered less desirable since they may include larger public gatherings of people. However, for commercial and industrial uses, most types of land uses can be accommodated in all but the greatest noise exposure areas (i.e. greater than 75dB) if NLR measures are incorporated into construction of the buildings.

4.4 Future Land Use Development Alternatives

The projections presented in the preceding sections related to potential future land use development impacts are directly linked to a set of assumptions that include the continuance of existing land use regulatory requirements, such as zoning and subdivision, which specify maximum densities and types of uses. However, it is possible and very probable that future land use development patterns in the JLUSA and AICUZ impact areas will be altered from their historical standards due to several key factors. Presently, the

remaining undeveloped land in the Study Area does not have access to municipal sewer and water systems and therefore, would have to be developed at lower densities. However, historical development trends in the City of Wichita have continued to push the limits of the City's urbanized area, which provides access to municipal sewer and water systems, ever further into the JLUSA around the northern fringes of McConnell AFB. This trend is coupled with the fact that the City of Derby, located at the southern extent of the JLUSA, has been growing at a rapid rate and is projected to continue doing so over the next several decades. These two growth centers, Wichita and Derby, will have a natural tendency to grow toward each other based on economic forces of attraction, a fact that has already been observed in recent development proposals in the JLUSA, as well as the long-term future land use plan that is being considered by the MAPD, which is illustrated in Figure 8. This long-term growth plan is reflective of input from the City of Derby. Derby however, is also presently in the process of updating its own comprehensive plan at this time. Based on these and other factors, it is reasonable to assume that within the next 20 to 30 years, the remaining undeveloped land area around McConnell AFB will be developed as an extension of Wichita's high density urban development that presently exists to the north of the Base.

5. POTENTIAL SECURITY ISSUES

The need to address security issues related to potential terrorist activities is a concern that has continued to increase and evolve since 9/11 and the unfolding of other events around the world. Although the JLUS process does not typically address the specific issues related to Anti-Terrorism and Force Protection (AT/FP), it is a peripheral issue in that it is directly affected by land use activities around a military installation and the potential conflicts that can arise. The establishment of standards and criteria designed to address anti-terrorist activities has primarily been initiated at the federal level through the Department of Homeland Security (DHS) and its subordinate and cooperating agencies. The Federal Emergency Management Agency (FEMA), in cooperation with branches of the armed services and other federal agencies, created a Risk Management Series[25] of manuals in 2003 that provides guidance for designing buildings and sites to reduce or minimize the impacts of terrorist activities. Although much of the information developed thus far focuses on "hardening" a building and the area immediately surrounding it, the document also recognizes the fact that site design on adjacent and nearby properties can also help to mitigate potential impacts.

Although the impetus for AT planning is being provided at the federal level, much of the responsibility for implementation of these directives and policies falls to local governments. Given this fact, it has become clear that local governments must now begin to plan for a variety of contingencies that revolve around potential terrorist activities in conjunction with existing efforts related to crime prevention and natural disaster preparedness. In light of this need, the American Planning Association (APA) has begun the process of developing key policies[26] intended to serve as a guide for state and local planners that addresses the following areas:

[25] *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings, Providing Protection to People and Buildings,* FEMA 426, December 2003.
[26] *Draft Policy Guide on Security,* American Planning Association, January 13, 2005 (Internet document)

- The General Need for a Planned Approach
- State and Local Policies Affecting Building Locations, Street Closures, and the Public Realm
- Policies and Standards Affecting the Location and Design of Federally Owned or Leased Facilities
- Security Planning for Transportation Facilities and Services
- Building Design for Security
- Incorporation of Security Issues into the Comprehensive Planning Process

These overarching policies represent a suitable framework for evaluating the potential of anti-terrorism issues related to McConnell. This is particularly true for the last issue above that recommends incorporating security issues as part of the comprehensive planning process as opposed to evaluating each development proposal on a case-by-case basis, which is generally the approach that is employed at this time.

The APA and FEMA guidelines highlight three *layers of defense* with regard to mitigating potential terrorist attacks against buildings or sites, where each layer is a demarcation point for a different set of security strategies.

- The first layer of defense is defined as the surrounding area, including installations, infrastructure, and other buildings outside the perimeter of the site.
- The second layer of defense includes the space and natural and physical barriers that can be introduced to protect a particular building. It includes the design of access points, parking, roadways, pedestrian walkways, natural barriers, security lighting, signage, and other features.
- The third layer of defense refers to the building envelope itself.

Of the three layers of defense outlined above, the one that this JLUS and the comprehensive plan can most directly affect is the first layer of defense, which relates to the site planning of land area outside the fence line of McConnell. As noted in the FEMA guidebook, efforts to mitigate potential threats with regard to land development should incorporate concepts that integrate land use planning, landscape architecture (vegetation, landforms, and water), site planning, and other strategies to mitigate the design basis threats as identified via a risk management assessment process. Risk management assessment is a multi-part process that includes threat assessment and vulnerability assessment, the results of which can be used to facilitate the adoption of planning activities within the first layer of defense.

When making decisions about anti-terrorism and security, FEMA guidelines recommend that planners and designers consider the following factors that would affect actions both on and off the Base property.

1) Building footprint relative to total land available;
2) Building location or, if undeveloped, suitable building locations relative to the site perimeter and adjacent land uses; distance between the perimeter fence and improved areas off site;
3) Access via foot, road, rail, water, and air, suitable to support a secure perimeter;

4) Current and planned infrastructure and its vulnerabilities, including easements, tunnels, pipes, and rights-of-way;
5) Infrastructure nodes that constitute single-point vulnerabilities;
6) Adjacent land uses and occupancies that could facilitate attacks or that are potential targets themselves and thus present collateral damage or cascading failure hazards;
7) Proximity to fire and police stations, hospitals, shelters, and other critical facilities that could be of use in an attack;
8) Natural hazards, susceptibility to subsidence or liquefaction, and other environmental considerations;
9) Presence of natural physical barriers such as water features, dense vegetation, and terrain that could provide access control and/or shielding, or suitability of the site for the incorporation of such features;
10) Topographic and climate characteristics that could affect the performance of chemical agents and other weapons, and
11) Observability from outside site boundaries; ability of vegetation in proximity to building or site to screen covert activity.

As the list above illustrates, many factors must be evaluated when considering an appropriate level of response to security threats around McConnell. As the FEMA report notes, addressing this issue is complicated by the fact that the nature of any potential threat is always changing. In addition, protection of the facility must also be balanced with other objectives, such as the efficient use of land and resources, and existing physical and fiscal constraints. Whereas it may be desirable to maintain as much of the land around the perimeter of McConnell in agricultural uses or very low residential development, this may not be practical from the perspective of the community or individual property owners, unless funding is available to purchase the land, or development rights, in order to achieve this level of security. It is clear that addressing security issues around McConnell in the future will require a holistic and cooperative approach between the military and community officials and representatives that is part of a systematic planning and implementation process.

6. POTENTIAL ECONOMIC IMPACTS OF RECOMMENDED ALTERNATIVES

This section provides an overview of the potential economic impacts that could result from implementation of the land use recommendations presented earlier in this report. Generally speaking, these potential economic impacts are related to how the options for the use or development of land could change if some of the recommendations are implemented. The recommendations presented offer a range of alternatives that the community can use for reducing future potential conflicts around McConnell. Given the flexibility associated with the various recommendations it is not possible to identify a single “bottom line” of potential economic impacts. Furthermore, because of the variability in the way that the recommended land use regulations and land development guidelines can be implemented, there is some uncertainty as to the ultimate economic impacts that could occur. Based on these considerations, the degree of specificity in the economic impacts presented is necessarily general and intended to only offer a range relating to the magnitude of potential impacts. The economic impacts are generally summarized and based on the impacts due to change in land development with regard to the construction of housing and non-residential building

square footage, and corresponding changes in value, expenditures, tax value, and employment.

6.1 Existing Mission Economic Impacts

The potential economic impacts associated with the land use recommendations relating to the existing mission area would be relatively modest given the limited amount of land affected, approximately 1,000 acres in total. This area encompasses the remaining undeveloped land within both the Clear Zones (CZ) and Accident Potential Zones (APZ). The first option for preserving the existing mission status involves a continuation of the land use regulations in place for the Airport Overlay (A-O) district. Although some changes to the types of uses permitted in the A-O are recommended, primarily in the CZ, the overall changes in land development should be relatively small. Overall, projected growth within the CZ/APZ portion of the existing mission area over the next 25 years is estimated to include 10 additional dwelling units, with employment increases of 560 and an additional demand for approximately 164,000 to 316,000 square feet of non-residential building space. In the noise contour area, which is smaller than the CZ/APZ area, the projected growth is slightly lower with approximately 200 employees and 63,100 to 120,600 square feet of building space. No addition dwelling units are projected within the noise contour area. If the existing land use regulations are slightly modified, as recommended, it is unlikely there would be any significant economic impacts to the projected levels of growth.

If an alternative land development scenario for acquiring the remaining undeveloped land within the CZ/APZ areas is pursued, it is likely to have a slightly noticeable economic impact since the projected levels of growth would be reduced. Under this scenario, none of the 10 dwelling units would be constructed which would represent an estimated loss of approximately $1.5 million in housing value, based on the average sale price of new homes in this area (approximately $156,000 per home). This reduced real estate value would represent approximately $20,000 annually in estimated property taxes, based on average mil rates for the area.

The potential impacts to non-residential development related to this land protection approach are more difficult to estimate. This is due to the fact that some of the projected increase in employment is likely to occur within existing establishments, or expansions of existing structures, which would not necessarily be affected by an expanded land acquisition program. A reasonable assumption, based on previously conducted market analysis, would be that 60% of the projected employment growth in the CZ/APZ areas would be contained in existing or expanded facilities and therefore, not impacted. This suggests that future employment growth in this area would be reduced to approximately 340, versus the projected 560, if the remaining undeveloped land were protected from further development. This reduced employment could result in a decreased demand for new non-residential building space that could reduce taxable property in the area by

approximately $300,000 to $600,000, with a corresponding decrease in annual property tax revenues by approximately $33,400 to $64,000.[27]

An additional economic impact related to implementation of the recommendations regarding the existing mission would involve costs associated with noise attenuation measures for housing construction. For the existing mission area, as defined by the 2004 noise contours, projections suggest that very few new housing units would be constructed within this area due to a limited supply of undeveloped land. However, if existing dwelling units were retrofitted the approximate cost could be as high as $30,000 per unit. For new construction, the cost per dwelling is less since the increase is related primarily to noise-resistant materials given that labor costs would already be reflected in the cost of a new home, whereas retrofitting costs would include both labor and materials.

6.2 Maximum Mission Economic Impacts

The potential economic impacts related to the maximum mission area are partially addressed in the preceding section regarding the existing mission impacts. That is because it is assumed that the short-term (two to three years) alternatives for preserving the maximum mission capabilities would also involve protecting land within the CZ/APZ areas since these areas remain unchanged for both mission scenarios examined in this report.

The potential long-term economic impacts related to the maximum mission could expand however, if additional actions are taken to preserve land within the 1994 contour area which contains approximately 3,900 additional acres of undeveloped land. If a regulatory approach is taken to reducing conflicts, by applying the LUCGs for example, the economic impacts would be relatively modest since a full range of development options would still be available. However, if a land acquisition program is considered it would affect future development, and its associated value, in a similar manner to the impacts discussed above for the existing mission area.

Projections of housing development within the maximum mission area indicate that an additional 521 dwelling units could be constructed by 2030. If all land available for constructing these units was acquired to reduce potential noise conflicts it would result in lost property and construction value of approximately $81 million. This decrease in construction would also affect property tax revenues with an estimated reduction of approximately $1 million annually that would not be available in the future.

An alternative to acquiring all of the potentially developable residential land would be to require noise level reduction methods be incorporated into building codes for new construction. This would eliminate the impacts discussed above but would increase construction costs for future dwelling units.

[27] This calculation assumes that the non-residential building square footage will reduced by 65,600 to 126,400 from projected levels. Based on average square foot values of $41.00/sf this represents a total of approximately $2.68 million to $5.16 million in appraised building value. Using the current assessment ratio of 11.5%, this represents taxable value of approximately $309,000 to $594,000. Based on an average mil rate of $108 per thousand the unavailable future property tax revenues are between $33,400 and $64,160.

A land acquisition program could have similar impacts on projected levels of non-residential development in the maximum mission area. It is estimated that employment in this area could increase by approximately 3,400 by 2030. It is also assumed that approximately 60% of this increase would occur in existing or expanded facilities, and therefore not affected by such a program. However, it could potentially reduce employment to 2,000, a reduction of approximately 1,400.

This decrease in projected employment could result in a corresponding decrease in the demand for new non-residential building space. The projected demand for this space based on employment growth ranges between 1.0 and 2.0 million square feet of which, approximately 40%, or 400,000 to 800,000 could be new construction. Using the same methodology described for the existing mission, this could represent a reduction in taxable property valuation of approximately $1.9 to $3.7 million and annual tax revenues of approximately $200,000 to $400,000.[28]

[28] Ibid

APPENDIX

Appendix Table A-1: Land Use Compatibility Guidelines

Appendix Table A-2: Acreage by Zoning Classification for Joint Land Use Study Area (JLUSA)

Appendix Table A-3: Acreage by Zoning Classification for 1994 Noise Contour Intervals Area – 2004

Appendix Table A-4: Acreage by Zoning Classification for 2004 Noise Contour Intervals

Appendix Table A-5: Acreage by Zoning Classification for Clear Zone and Accident Potential Zones – 2004

Appendix A-6: Subtitle B – Real Property and Facilities Administration – Public Law 107-314 National Defense Authorization Act 2003

Appendix A-7: References

Appendix A-8: McConnell Air Force Base Joint Land Use Study Summary – Progress Report #1 (January 11-12, 2005) (Does not include map)

Appendix A-9: McConnell Air Force Base Joint Land Use Study Summary – Progress Report #2 (April 12-13, 2005) (Does not include map)

Land-Use Compatibility Guidelines

Appendix Table A-1 identifies land uses and possible noise exposure and accident potential combinations for McConnell AFB. These noise guidelines are essentially the same as those published by the Federal Interagency Committee on Urban Noise in the June 1980 publication, *Guidelines for Considering Noise in Land-Use Planning and Control* the U.S. Department of Transportation publication, *Standard Land Use Coding Manual* (SLUCM), has been used to identify and code land-use activities. The designations are a combination of criteria listed in the Legend and Notes at the end of the table. For example, Y1 means land use and related structures are compatible without restriction at a suggested maximum density of 1-2 dwelling units per acre, possibly increased under a Planned Unit Development where lot coverage is less than 20%. This table was originally presented in the 2004 AICUZ Study for McConnell AFB.

Appendix Table A-1
Land Use Compatibility Guidelines

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	**Name**	**Clear Zone**	**APZ-I**	**APZ-II**	**65-69**	**70-74**	**75-79**	**80+**
10	**Residential**							
11	Household units							
11.11	Single units; detached	N	N	Y[1]	A[11]	B[11]	N	N
11.12	Single units; semidetached	N	N	N	A[11]	B[11]	N	N
11.13	Single units; attached row	N	N	N	A[11]	B[11]	N	N
11.21	Two units; side-by-side	N	N	N	A[11]	B[11]	N	N
11.22	Two units; one above the other	N	N	N	A[11]	B[11]	N	N
11.31	Apartments; walk up	N	N	N	A[11]	B[11]	N	N
11.32	Apartments; elevator	N	N	N	A[11]	B[11]	N	N
12	Group quarters	N	N	N	A[11]	B[11]	N	N
13	Residential hotels	N	N	N	A[11]	B[11]	N	N
14	Mobile home parks or courts	N	N	N	N	N	N	N
15	Transient lodgings	N	N	N	A[11]	B[11]	C[11]	N
16	Other Residential	N	N	N	A[11]	B[11]	N	N
20	**Manufacturing**							
21	Food & kindred products; manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
22	Textile mill products; manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
23	Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing	N	N	N[2]	Y	Y[12]	Y[13]	Y[14]
24	Lumber and wood products (except furniture); manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
25	Furniture and fixtures; manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
26	Paper & allied products; manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
27	Printing, publishing, and allied industries	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
28	Chemicals and allied products; manufacturing	N	N	N[2]	Y	Y[12]	Y[13]	Y[14]
29	Petroleum refining and related industries	N	N	Y	Y	Y[12]	Y[13]	Y[14]
30	**Manufacturing**							
31	Rubber and misc. plastic products, manufacturing	N	N[2]	N[2]	Y	Y[12]	Y[13]	Y[14]
32	Stone, clay and glass products manuf.	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
33	Primary metal industries	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
34	Fabricated metal products; manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks manufacturing	N	N	N[2]	Y	A	B	N

Appendix Table A-1
Land Use Compatibility Guidelines

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	**Name**	**Clear Zone**	**APZ-I**	**APZ-II**	**65-69**	**70-74**	**75-79**	**80+**
39	Miscellaneous manufacturing	N	Y[2]	Y[2]	Y	Y[12]	Y[13]	Y[14]
40	**Transportation, communications and utilities**							
41	Railroad, rapid rail transit and street railroad transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
42	Motor vehicle transportation	N[3]	Y	Y	Y	Y[12]	Y[13]	Y[14]
43	Aircraft transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
44	Marine craft transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
45	Highway & street right-of-way	N[3]	Y	Y	Y	Y[12]	Y[13]	Y[14]
46	Automobile parking	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
47	Communications	N[3]	Y[4]	Y	Y	A[15]	B[15]	N
48	Utilities	N[3]	Y[4]	Y	Y	Y	Y[12]	Y[13]
49	Other transportation communications and utilities	N[3]	Y[4]	Y	Y	A[15]	B[15]	N
50	**Trade**							
51	Wholesale trade	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
52	Retail trade-building materials, hardware and farm equipment	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
53	Retail trade-general merchandise	N	N[2]	Y[2]	Y	A	B	N
54	Retail trade-food	N	N[2]	Y[2]	Y	A	B	N
55	Retail trade-automotive, marine craft, aircraft and accessories	N	Y[2]	Y[2]	Y	A	B	N
56	Retail trade-apparel and accessories	N	N[2]	Y[2]	Y	A	B	N
57	Retail trade-furniture, home furnishings and equipment	N	N[2]	Y[2]	Y	A	B	N
58	Retail trade-eating and drinking establishments	N	N	N[2]	Y	A	B	N
59	Other retail trade	N	N[2]	Y[2]	Y	A	B	N
60	**Services**							
61	Finance, insurance and real estate services	N	N	Y[6]	Y	A	B	N
62	Personal services	N	N	Y[6]	Y	A	B	N
62.4	Cemeteries	N	Y[7]	Y[7]	Y	Y[12]	Y[13]	Y[14,21]
63	Business services	N	Y[8]	Y[8]	Y	A	B	N
64	Repair services	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
65	Professional services	N	N	Y[6]	Y	A	B	N
65.1	Hospitals, nursing homes	N	N	N	A*	B*	N	N
65.1	Other medical facilities	N	N	N	Y	A	B	N
66	Contract construction services	N	Y[6]	Y	Y	A	B	N
67	Governmental services	N	N	Y[6]	Y*	A*	B*	N
68	Educational services	N	N	N	A*	B*	N	N
69	Miscellaneous services	N	N[2]	Y[2]	Y	A	B	N
70	**Cultural, entertainment and recreational**							
71	Cultural activities (including churches)	N	N	N[2]	A*	B*	N	N
71.2	Nature exhibits	N	Y[2]	Y	Y*	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	A	B	N	N
72.11	Outdoor music shell, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	N	N	N	Y[17]	Y[17]	N	N
3	Amusements	N	N	Y[8]	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y[8,9,10]	Y	Y*	A*	B*	N
75	Resorts and group camps	N	N	N	Y*	Y*	N	N
76	Parks	N	Y[8]	Y[8]	Y*	Y*	N	N
79	Other cultural, entertainment and	N	Y[9]	Y[9]	Y*	Y*	N	N

Appendix Table A-1 Land Use Compatibility Guidelines								
Land Use		**Accident Potential Zones**			**Noise Zones**			
SLUCM No.	**Name**	**Clear Zone**	**APZ-I**	**APZ-II**	**65-69**	**70-74**	**75-79**	**80+**
	recreation							
80	**Resources production and extraction**							
81	Agriculture (except livestock)	Y[16]	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
81.5 to 81.7	Livestock farming and animal breeding	N	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
82	Agricultural related activities	N	Y[5]	Y	Y[18]	Y[19]	N	N
83	Forestry activities and related services	N[5]	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
84	Fishing activities and related services	N[5]	Y[5]	Y	Y	Y	Y	Y
85	Mining activities and related services	N	Y[5]	Y	Y	Y	Y	Y
89	Other resources production and extraction	N	Y[5]	Y	Y	Y	Y	Y

LEGEND

SLUCM – Standard Land Use Coding Manual, U.S. Department of Transportation.
Y – (Yes) – Land use and related structures are compatible without restriction.
N – (No) – Land use and related structures are not compatible and should be prohibited.
Y[1] – (yes with restrictions) – Land use and related structures generally compatible; see notes 1-21.
N[1] – (no with exceptions) – See notes 1-21.
NLR –(Noise Level Reduction) – NLR (outdoor to outdoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.
A, B, or C – Land use and related structures generally compatible; measures to achieve NLR or A (DNL 25 dB), B (DNL 30 dB), or C (DNL 35 dB) need to be incorporated into the design and construction structures.
A, B, and C – Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.
***** - The designation of these uses as "compatible" in this zone reflects individual federal agency and program consideration of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

NOTES

1. Suggested maximum density of 1-2 dwelling units per acre possibly increased under a Planned Unit Development where maximum lot coverage is less than 20%.
2. Within each land use category, uses exist where further definition may be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible in any accident potential zone (CZ, APZI, or APZ II.)
3. The placing of structures, buildings, or aboveground utility lines in the clear zone is subject to severe restrictions. In a majority of the clear zones, these items are prohibited. See AF I32-7063 and UFC 3-260-01 for specific guidance.
4. No passenger terminals and no major aboveground transmission lines in APZI.
5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.
6. Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.
7. Excludes chapels.
8. Facilities must be low intensity.
9. Clubhouse not recommended.
10. Areas for gatherings of people are not recommended.
11.
    a. Although local conditions may require residential use, it is discouraged in DNL 65-69 dB and strongly discouraged in DNL 70-74 dB. An evaluation should be conducted prior to approvals, indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones, and there are no viable alternative locations.
    b. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor NLR for DNL 65-69 dB and DNL 70-74 dB should be incorporated into building codes and considered in individual approvals.
    c. NLR criteria will not eliminate outdoor noise problems: However, building location and site planning,

and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.

12. Measures to achieve the same NLR as required for facilities in the DNL 65-69 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
13. Measures to achieve the same NLR as required for facilities in the DNL 70-74 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
14. Measures to achieve the same NLR as required for facilities in the DNL 75-79 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
15. If noise sensitive, use indicated NLR; if not, the use is compatible.
16. No buildings
17. Land use is compatible provided special sound reinforcement systems are installed.
18. Residential buildings require the same NLR required for facilities in the DNL 65-69 dB range.
19. Residential buildings require the same NLR required for facilities in the DNL 70-74 dB range.
20. Residential buildings are not permitted.
21. Land use is not recommended. If the community decides the use is necessary, personnel should wear hearing protection devices.

Appendix Table A-2
Acreage by Zoning Classification for Joint Land Use Study Area (JLUSA) - 2004

	Wichita/Sedgwick		Derby		JLUSA
Zoning	**Zoning District**	**Acres**	**Zoning District**	**Acres**	**Total**
Residential	Total	12,651.7	Total	1201.3	13,853.03
Med/High Density	SF-5	1,937.1	R-1	1,059.5	
	MH	1.6	R-1A	8.7	
	MF-18	98.0	R-2	28.7	
	MF-29	154.5	R-3	104.5	
	TF-3	302.8			
	SF-20	4,283.7			
	B	130.9			
	Subtotal	6,908.6	Subtotal	1,201.3	
Low Density					
	RR	5,743.1	-	0	
Commercial	Total	1,078.3	Total	265.84	1,344.12
Retail/General	LC	548.0	B-2	31.0	
	GC	341.4	B-3	215.8	
	NR	9.2			
	Subtotal	898.5	Subtotal	246.8	
Office/Mixed	GO	83.6	B-1	19.1	
	NO	5.5			
	OW	16.5			
	PUD	74.2			
	Subtotal	179.8	Subtotal	19.1	
Industrial	Total	1,973.4	Total	82.0	2,055.33
	LI	1,968.3	B-5	82.0	
	GI	5.1			
	Subtotal	1,973.4	Subtotal	82.0	
Institutional		-	I-1	31.9	31.91
	AFB/Federal*	2,721.0			
Subtotal		18,424.4		1,581.0	**20,005**
Rights-of-Way					**2,037**
Total Land Area					**22,042**

* NOTE: AFB/Federal is not a zoning designation but rather denotes ownership of land that is controlled
by McConnell AFB and/or the Federal Government
Source: City of Wichita GIS and RKG Associates, Inc.

Appendix Table A-3
Acreage by Zoning Classification for 1994 Noise Contour Intervals Area - 2004

		Wichita/Sedgwick County					Derby						1994
		Noise Contour Intervals						Noise Contour Intervals					Contours
Zoning	**Zoning District**	**65-69**	**70-74**	**75-79**	**80+**	**Subtotal**	**Zoning District**	**65-69**	**70-74**	**75-79**	**80+**	**Subtotal**	**Total**
Residential	Total	4,357.7	2,077.4	1,114.8	448.6	7,998.4	Total	678.4	464.0	138.7	6.7	1,287.6	9,286.0
Med/High Density	MF-29	53.3	22.7	31.2	1.8		R-1	630.6	409.1	135.7	6.7		
	SF-5	1,643.0	717.6	135.0	1.8		R-1A	-	8.7	-	-		
	TF-3	121.2	24.8	9.6	-		R-2	2.8	25.9	-	-		
	B	126.0	42.7	5.3	-		R-3	45.0	20.2	3.0	-		
	MF-18	66.3	0.2	-	-			-	-	-	-		
	SF-20	904.5	601.5	438.0	100.3			-	-	-	-		
	MH	-	1.6	-	-								
	Subtotal	2,914.4	1,411.2	619.1	104.0		Subtotal	678.4	464.0	138.7	6.7		
Low Density													
	RR	1,443.3	666.2	495.6	344.6			-	-	-	-		
Commercial	Total	337.5	239.9	244.0	75.5	896.9	Total	67.3	49.6	107.0	-	223.8	1,120.8
Retail/General	GC	28.0	25.0	127.2	48.0		B-4	37.2	-	-	-		
	NR	-	2.3	-	-		B-2	-	1.4	8.5	-		
	LC	249.8	182.7	107.2	27.1		B-3	21.8	45.5	93.9	-		
	Subtotal	277.8	210.1	234.4	75.1		Subtotal	59.0	46.8	102.4	-		
Office/Mixed													
	OW	13.3	2.8	-	-		B-1	8.3	2.8	4.6	-		
	GO	36.0	16.5	6.7	0.5			-	-	-	-		
	PUD	10.3	10.6	3.0	-			-	-	-	-		
	Subtotal	59.7	29.8	9.6	0.5		Subtotal	8.3	2.8	4.6	-		
Industrial	Total	470.6	790.4	619.8	321.4	2,202.2	Total	50.7	-	18.4	63.6	132.7	2,334.9
	GI	-	-	0.5	4.6		M-1	50.7	-	-	-		
	LI	470.6	790.4	619.4	316.8		B-5	-	-	18.4	63.6		
	Subtotal	470.6	790.4	619.8	321.4		Subtotal	50.7	-	18.4	63.6		
Institutional	Total	-	-	-	-	-	I-1	9.4	2.1	-	-	11.5	11.5
	AFB/Federal*	327.4	550.7	474.5	1,369.0	2,721.6							
Subtotal		5,493.1	3,658.4	2,453.2	2,214.5	13,819.2		805.8	515.6	264.0	70.2	1,655.6	15,474.8
Rights-of-Way													2,302.2
Total Land Area													17,777.0

* NOTE: AFB/Federal is not a zoning designation but rather denotes ownership of land that is controlled by McConnell AFB and/or the Federal Government
Source: City of Wichita GIS and RKG Associates, Inc.

Appendix Table A-4
Acreage by Zoning Classification for 2004 Noise Contour Intervals

		Wichita/Sedgwick County					Derby						2004 Contours
		Noise Contour Intervals						Noise Contour Intervals					
Zoning	**Zoning District**	**65-69**	**70-74**	**75-79**	**80+**	**Subtotal**	**Zoning District**	**65-69**	**70-74**	**75-79**	**80+**	**Subtotal**	**Total**
Residential	Total	577.6	42.2	-	-	619.8	Total	-	-	-	-	-	619.8
Med/High Density	SF-5	97.8	-	-	-			-	-	-	-		
	MF-29	29.4	-	-	-			-	-	-	-		
	TF-3	8.7	-	-	-			-	-	-	-		
	SF-20	4.4	-	-	-			-	-	-	-		
	B	4.4	-	-	-			-	-	-	-		
	Subtotal	144.6	-	-	-								
Low Density	RR	433.0	42.2	-	-			-	-	-	-		
Commercial	Total	183.9	6.2	-	-	190.1	Total	17.0	-	-	-	17.0	207.1
Retail/General	LC	86.5	-	-	-		B-2	2.1	-	-	-		
	GC	89.3	6.2	-	-		B-3	14.9	-	-	-		
	Subtotal	175.8	6.2	-	-		Subtotal	17.0	-	-	-		
Office/Mixed	PUD	3.0	-	-	-			-	-	-	-		
	GO	5.1	-	-	-			-	-	-	-		
	Subtotal	8.0	-	-	-			-	-	-	-		
Industrial	Total	233.9	149.0	-	-	382.9	Total	37.4	-	-	-	37.4	420.3
	GI	3.4	-	-	-		B-5	37.4	-	-	-		
	LI	230.5	149.0	-	-			-	-	-	-		
	Subtotal	233.9	149.0	-	-		Subtotal	37.4	-	-	-		
	AFB/Federal*	366.4	500.7	321.6	71.9	1,260.6							1,260.6
Subtotal		1,361.8	698.1	321.6	71.9	2,453.4		54.4	-	-	-	54.4	2,507.8
Rights-of-Way													7.2
Total Land Area													2,515.0

* NOTE: AFB/Federal is not a zoning designation but rather denotes ownership of land that is controlled by McConnell AFB and/or the Federal Government
Source: City of Wichita GIS and RKG Associates, Inc.

Appendix Table A-5
Acreage by Zoning Classification for Clear Zones and Accident Potential Zones - 2004**
(All acreage located in Wichita/Sedgwick County except where noted Derby)

		North of Runways				South of Runways				CZ and APZ
	Zoning District	**CZN**	**APZ-I-N**	**AP-II-N**	**Subtotal**	**CZS**	**APZ-I-S**	**APZ-II-S**	**Subtotal**	**Total**
Residential	Total	-	31.5	295.5	326.9	7.1	357.7	374.9	739.7	1,066.6
Med/High Density	SF-5	-	31.5	231.4		-	-	-		
	TF-3	-	-	13.3		-	-	-		
	B	-	-	12.6		-	-	-		
	MF-29	-	-	38.1		-	-	-		
	SF-20	-	-	-		2.1	41.3	36.3		
	R-1 (Derby)	-	-	-		-	-	48.2		
	Subtotal	-	31.5	295.5		2.1	41.3	84.5		
Low Density										
	RR	-	-	-		5.1	316.3	290.4		
Commercial	Total	-	52.6	150.8	203.4	-	28.9	51.9	80.8	284.2
Retail/General	LC	-	0.9	48.9		-	28.9	7.6		
	GC	-	47.5	91.8		-	-	33.7		
	NR	-	2.3	-		-	-	-		
	B-3 (Derby)	-	-	-		-	-	10.6		
	Subtotal	-	50.7	140.7		-	28.9	51.9		
Office/Mixed	GO	-	1.8	10.1		-	-	-		
Industrial	Total	138.2	293.6	1.1	433.0	1.8	3.2	86.1	91.1	524.1
	LI	138.2	293.6	1.1		1.8	3.2	4.1		
	B-5 (Derby)	-	-	-		-	-	82.0		
	Subtotal	138.2	293.6	1.1		1.8	3.2	86.1		
	AFB/Federal*	123.5	-	-		235.5	17.0	-		376.0
	Subtotal	261.7	377.6	447.4		244.5	406.8	512.9		**2,250.9**
	Rights-of-Way									**367**
	Total Land Area									**2618**

* NOTE: AFB/Federal is not a zoning designation but rather denotes ownership of land that is controlled by McConnell AFB and/or the Federal Government
Source: City of Wichita GIS and RKG Associates, Inc.

Appendix A-6

National Defense Authorization Act 2003

Public Law 107-314

Subtitle B--Real Property and Facilities Administration

SEC. 2811. AGREEMENTS TO LIMIT ENCROACHMENTS AND OTHER CONSTRAINTS ON MILITARY TRAINING, TESTING, AND OPERATIONS.

(a) IN GENERAL- Chapter 159 of title 10, United States Code, is amended by inserting after section 2684 the following new section:

`Sec. 2684a. Agreements to limit encroachments and other constraints on military training, testing, and operations

`(a) AGREEMENTS AUTHORIZED- The Secretary of Defense or the Secretary of a military department may enter into an agreement with an eligible entity described in subsection (b) to address the use or development of real property in the vicinity of a military installation for purposes of--

`(1) limiting any development or use of the property that would be incompatible with the mission of the installation; or

`(2) preserving habitat on the property in a manner that--

`(A) is compatible with environmental requirements; and

`(B) may eliminate or relieve current or anticipated environmental restrictions that would or might otherwise restrict, impede, or otherwise interfere, whether directly or indirectly, with current or anticipated military training, testing, or operations on the installation.

`(b) ELIGIBLE ENTITIES- An agreement under this section may be entered into with any of the following:

`(1) A State or political subdivision of a State.

`(2) A private entity that has as its stated principal organizational purpose or goal the conservation, restoration, or preservation of land and natural resources, or a similar purpose or goal, as determined by the Secretary concerned.

`(c) INAPPLICABILITY OF CERTAIN CONTRACT REQUIREMENTS- Chapter 63 of title 31 shall not apply to any agreement entered into under this section.

`(d) ACQUISITION AND ACCEPTANCE OF PROPERTY AND INTERESTS- (1) An agreement with an eligible entity under this section may provide for--

`(A) the acquisition by the entity of all right, title, and interest in and to any real property, or any lesser interest in the property, as may be appropriate for purposes of this section; and

`(B) the sharing by the United States and the entity of the acquisition costs.

`(2) Property or interests may not be acquired pursuant to the agreement unless the owner of the property or interests consents to the acquisition.

`(3) The agreement shall require the entity to transfer to the United States, upon the request of the Secretary concerned, all or a portion of the property or interest acquired under the agreement or a lesser interest therein. The Secretary shall limit such transfer request to the minimum property or interests necessary to ensure that the property concerned is developed and used in a manner appropriate for purposes of this section.

`(4) The Secretary concerned may accept on behalf of the United States any property or interest to be transferred to the United States under the agreement.

`(5) For purposes of the acceptance of property or interests under the agreement, the Secretary concerned may accept an appraisal or title documents prepared or adopted by a non-Federal entity as satisfying the applicable requirements of section 301 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. 4651) or section 3111 of title 40, if the Secretary concerned finds that the appraisal or title documents substantially comply with the requirements.

`(e) ACQUISITION OF WATER RIGHTS- The authority of the Secretary concerned to enter into an agreement under this section for the acquisition of real property (or an interest therein) includes the authority to support the purchase of water rights from any available source when necessary to support or protect the mission of a military installation.

`(f) ADDITIONAL TERMS AND CONDITIONS- The Secretary concerned may require such additional terms and conditions in an agreement under this section as the Secretary considers appropriate to protect the interests of the United States.

`(g) FUNDING- (1) Except as provided in paragraph (2), funds authorized to be appropriated for operation and maintenance of the Army, Navy, Marine Corps, Air Force, or Defense-wide activities may be used to enter into agreements under this section.

`(2) In the case of a military installation operated primarily with funds authorized to be appropriated for research, development, test, and evaluation, funds authorized to be appropriated for the Army, Navy, Marine Corps, Air Force, or Defense-wide activities for research, development, test, and evaluation may be used to enter into agreements under this section with respect to the installation.

`(h) DEFINITIONS- In this section:

`(1) The term `Secretary concerned' means the Secretary of Defense or the Secretary of a military department.

`(2) The term `State' includes the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Marianas, and the territories and possessions of the United States.'.

(b) CLERICAL AMENDMENT- The table of sections at the beginning of such chapter is amended by inserting after the item relating to section 2684 the following new item:

`2684a. Agreements to limit encroachments and other constraints on military training, testing, and operations.'.

SEC. 2812. CONVEYANCE OF SURPLUS REAL PROPERTY FOR NATURAL RESOURCE CONSERVATION PURPOSES.

(a) CONVEYANCE AUTHORITY- (1) Chapter 159 of title 10, United States Code, is amended by inserting after section 2694 the following new section:

`Sec. 2694a. Conveyance of surplus real property for natural resource conservation

`(a) AUTHORITY TO CONVEY- The Secretary of a military department may convey to an eligible entity described in subsection (b) any surplus real property that--

`(1) is under the administrative control of the Secretary;

`(2) is suitable and desirable for conservation purposes;

`(3) has been made available for public benefit transfer for a sufficient period of time to potential claimants; and

`(4) is not subject to a pending request for transfer to another Federal agency or for conveyance to any other qualified recipient for public benefit transfer under the real property disposal processes and authorities under subtitle I of title 40.

`(b) ELIGIBLE ENTITIES- The conveyance of surplus real property under this section may be made to any of the following:

`(1) A State or political subdivision of a State.

`(2) A nonprofit organization that exists for the primary purpose of conservation of natural resources on real property.

`(c) REVISIONARY INTEREST AND OTHER DEED REQUIREMENTS- (1) The deed of conveyance of any surplus real property conveyed under this section shall require the property to be used and maintained for the conservation of natural resources in perpetuity. If the Secretary concerned determines at any time that the property is not being used or maintained for such purpose, then, at the option of the Secretary, all or any portion of the property shall revert to the United States.

`(2) The deed of conveyance may permit the recipient of the property--

`(A) to convey the property to another eligible entity, subject to the approval of the Secretary concerned and subject to the same covenants and terms and conditions as provided in the deed from the United States; and

`(B) to conduct incidental revenue-producing activities on the property that are compatible with the use of the property for conservation purposes.

`(3) The deed of conveyance may contain such additional terms, reservations, restrictions, and conditions as the Secretary concerned considers appropriate to protect the interests of the United States.

`(d) RELEASE OF COVENANTS- With the concurrence of the Secretary of Interior, the Secretary concerned may grant a release from a covenant included in the deed of conveyance of real property conveyed under this section, subject to the condition that the recipient of the property pay the fair market value, as determined by the Secretary concerned, of the property at the time of the release of the covenant. The Secretary concerned may reduce the amount required to be paid under this subsection to account for the value of the natural resource conservation benefit that has accrued to the United States during the period the covenant was in effect, if the benefit was not taken into account in determining the original consideration for the conveyance.

`(e) CONGRESSIONAL NOTIFICATION- The Secretary concerned may not approve of the reconveyance of real property under subsection (c) or grant the release of a covenant under subsection (d) until the Secretary notifies the appropriate committees of Congress of the proposed reconveyance or release and a period of 21 days elapses from the date the notification is received by the committees.

`(f) LIMITATIONS- The conveyance of real property under this section shall not be used as a condition of allowing any defense activity under any Federal, State, or local permitting or review process. The Secretary concerned may make the conveyance, with the restrictions specified in subsection (c), to establish a mitigation bank, but only if the establishment of the mitigation bank does not occur in order to satisfy any condition for permitting military activity under a Federal, State, or local permitting or review process.

`(g) CONSIDERATION- In fixing the consideration for the conveyance of real property under this section, or in determining the amount of any reduction of the amount to be paid for the release of a covenant under subsection (d), the Secretary concerned shall take into consideration any benefit that has accrued or may accrue to the United States from the use of such property for the conservation of natural resources.

`(h) RELATION TO OTHER CONVEYANCE AUTHORITIES- (1) The Secretary concerned may not make a conveyance under this section of any real property to be disposed of under a base closure law in a manner that is inconsistent with the requirements and conditions of the base closure law.

`(2) In the case of real property on Guam, the Secretary concerned may not make a conveyance under this section unless the Government of Guam has been first afforded the opportunity to acquire the real property as authorized by section 1 of Public Law 106-504 (114 Stat. 2309).

`(i) DEFINITIONS- In this section:

> `(1) The term `appropriate committees of Congress' has the meaning given such term in section 2801 of this title.
>
> `(2) The term `base closure law' means the following:
>
> > `(A) Section 2687 of this title.
> >
> > `(B) Title II of the Defense Authorization Amendments and Base Closure and Realignment Act of 1988 (10 U.S.C. 2687 note).

`(C) The Defense Base Closure and Realignment Act of 1990 (part A of title XXIX of Public Law 101-510; 10 U.S.C. 2687 note).

`(D) Any other similar authority for the closure or realignment of military installations that is enacted after the date of the enactment of the Bob Stump National Defense Authorization Act for Fiscal Year 2003.

`(3) The term `Secretary concerned' means the Secretary of a military department.

`(4) The term `State' includes the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Marianas, and the territories and possessions of the United States.'.

(2) The table of sections at the beginning of such chapter is amended by inserting after the item relating to section 2694 the following new item:

`2694a. Conveyance of surplus real property for natural resource conservation.'.

(b) ACCEPTANCE OF FUNDS TO COVER ADMINISTRATIVE EXPENSES- Section 2695(b) of such title is amended by adding at the end the following new paragraph:

`(5) The conveyance of real property under section 2694a of this title.'.

(c) AGREEMENTS WITH NONPROFIT NATURAL RESOURCE CONSERVATION ORGANIZATIONS- Section 2701(d) of such title is amended--

(1) in the subsection heading, by striking `AGENCIES' and inserting `ENTITIES';

(2) in paragraph (1)--

(A) by striking `with any State or local government agency, or with any Indian tribe,' and inserting `any State or local government agency, any Indian tribe, or any nonprofit conservation organization'; and

(B) by striking `the agency' and inserting `the agency, Indian tribe, or organization'; and

(3) by striking paragraph (4), as redesignated by section 311(2) of this Act, and inserting the following new paragraph:

`(4) DEFINITIONS- In this subsection:

`(A) The term `Indian tribe' has the meaning given such term in section 101(36) of CERCLA (42 U.S.C. 9601(36)).

`(B) The term `nonprofit conservation organization' means any non-governmental nonprofit organization whose primary purpose is conservation of open space or natural resources.

Appendix A-7
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9. Oaklawn/Sunview Neighborhood Revitalization Plan, Oaklawn/Sunview Neighborhood Steering Committee

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11. Subdivision Regulations of the City of Derby Kansas, Derby City Planning Commission & City Staff, 1997

12. City of Derby Zoning Ordinance, 2001

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15. Eastern Carolina Joint Land Use Study – Creating a Future, Eastern Carolina Council Region P Council of Governments, November 2002

16. Escambia County Joint Land Use Study, U.S. Navy, Dept. of Defense, September 2003

17. Arizona Military Regional Compatibility Project – Joint Land Use Study – Part One: Luke Auxiliary Field #1, Arizona Department of Commerce, May 2004

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22. Approaches for Evaluation the Impact of Urban Encroachment on Installation Training/Testing, James D. Westervelt, March 2004

McConnell Air Force Base Joint Land Use Study Summary - Progress Report #1

Derby-Wichita-Sedgwick County, Kansas January 11-12, 2005

INTRODUCTION

In 1985 the U.S. Department of Defense (DoD) instituted a cooperative process referred to as a Joint Land Use Study (JLUS) Program to evaluate land use and development trends on property adjacent to active military facilities. This handout represents a summary of the first progress report completed as part of the McConnell Air Force Base (AFB) Joint Land Use Study. During the past several decades the U.S. Department of Defense (DoD) has become increasingly concerned about the impacts of land development adjacent to military installations. Across the country incompatible residential and commercial development patterns have created conflicts between the operation and training missions of military bases and local communities. These land use conflicts, often referred to as encroachment, could eventually threaten public safety and livability due to a wide variety of concerns, such as aircraft noise, associated with military operations. The JLUS is used to identify actions that could be taken by a community and military installation to solve existing problems and prevent future ones.

The JLUS is normally initiated at military bases with aviation facilities after the completion of an Air Installation Compatible Use Zone (AICUZ) study which examines possible noise and safety impacts associated with aviation activities. An update of the McConnell AFB AICUZ study was completed in 2004.

Preparation of the JLUS for McConnell AFB involves a number of key tasks including:

- Analysis and mapping of existing land uses as well as an assessment of land use changes since 1995. This task also includes an evaluation of long-range planning efforts for areas adjacent to McConnell AFB.
- An examination of aviation activities at McConnell AFB as well as Colonel James Jabara Airport and adjacent civilian aircraft testing facilities.
- An assessment of future development potential in the study area and the identification of possible future land use conflicts.
- Identification of recommendations that could result in a reduction of possible land use conflicts with future operations at McConnell AFB.

The information summarized in this handout addresses the first two tasks listed above.

The ultimate goal of this study, as noted earlier, is to develop a strategy comprised of recommendations that will allow all participants involved to achieve a balance between future land use planning, housing growth and economic development that is compatible with the operations of McConnell Air Force Base.

The need to identify this balance is particularly important in the case of McConnell AFB given the installation's recent mission change. In 2002, the mission of the Base changed from operating B-1, C-12, and F-16 aircraft to the operation of KC-135 aircraft. This change necessitated an update of the AICUZ study that was last completed in 1994. The AICUZ study analyzes aircraft noise using computer-based noise models as well as identifying accident potential locations related to base operations. The updated AICUZ for McConnell AFB identified a smaller area affected by noise associated with the current mission of the Base. The change in the size of noise contour areas from 1994 to 2004 is illustrated in Figure 1. However, because future missions of the Base could possibly involve the types of aviation uses that existed prior to 2002, this study has also analyzed existing and future land development in terms of the AICUZ boundaries that were established in the 1994 study.

SUMMARY OF MAJOR FINDINGS AND CONCLUSIONS

A. Study Area Background Information

- This Joint Land Use Study (JLUS) progress report contains an analysis of land use and development trends for four specific areas:

  - The JLUS project area that contains over 22,200 acres
  - The 1994 Air Installation Compatible Use Zone (AICUZ) that encompasses approximately 17,777 acres within the identified noise contour boundaries
  - The 2004 AICUZ that contains approximately 2,515 acres within the identified noise contour boundaries.
  - The Clear Zones (CZ) and the Accident Potential Zones (APZ) containing approximately 2,618 acres, which includes about 385 acres located on McConnell AFB.

- The U.S. Department of Defense has created guidelines concerning the types of land uses appropriate within specific noise contours. The kinds of residential land uses, based on Day-Night Average Weighted Sound Levels (DNL), suggested as compatible with the identified noise contours at McConnell are noted below:

  - DNL 65-69 decibels (dB) – Although residential development is discouraged for land located in this noise contour, it is recommended that if residential uses are permitted, noise reduction efforts be incorporated into building codes and considered in the individual approval of development proposals.

  - DNL 70-74 dB – Although residential development is strongly discouraged within this noise contour, it is recommended that if residential uses are permitted, noise reduction efforts be incorporated into building codes and considered in the individual approval of development proposals.

  - DNL 75-79 dB - Since residential development is not compatible within this noise contour, it is recommended that residential uses be prohibited.

  - DNL 80 dB or greater – Since residential development is not compatible within this noise contour, it is recommended that residential uses be prohibited.

B. Aviation Facilities Overview

- The 1994 AICUZ for McConnell AFB included a high percentage of B-1B "Lancer" aircraft activity, which is a very loud jet aircraft (See Figure 2).

- The 2004 AICUZ for McConnell AFB is based on a change in the Base's mission involving the KC-135 tanker aircraft.

- There are two parallel 12,000 foot runways at McConnell AFB. These runways accommodate approximately 70,000 operations (takeoffs and landings) per year.

- Colonel James Jabara Airport, located about nine miles north of McConnell AFB, has a runway approximately 6,100 feet long. This general aviation (GA) airport had about 38,700 operations in 2003, and is projecting approximately 44,200 operations by 2008.

- Boeing Company performs aircraft modifications to heavy air carriers at a facility on the west side of the Base. A relatively low level of operations, approximately 18 per month, results from the Boeing facility.

- The Beech Factory Airport has one runway that is 8,000 feet long. There are approximately 32,000 operations at this facility per year.

- Cessna Aircraft Field, located north of McConnell AFB, has two parallel runways. The western runway, which aligns with a runway at McConnell, is closed. There are approximately 100 operations at Cessna Aircraft Field per year.

C. Population and Land Use Changes

- The JLUS area experienced a population growth of about 12.5% (approximately 4,000 people) between 1990 and 2000. This was comparable

to the population growth rate in Sedgwick County (12.2%) and the City of Wichita (13.2%) during the same time period. The population in Derby increased by about 21% (approximately 3,100 people) between 1990 and 2000.

- Population growth in the 1994 AICUZ area was about 5% (approximately 2,000 people) between 1990 and 2000, compared to a rate 0.1% (1 person) in the 2004 AICUZ area and 5.3% (233 individuals) in the Accident Potential Zones (APZ).

- Approximately 9,600 acres in the JLUS area can be considered developed. This represents about 44% of an estimated 22,000 acres located in this area. About 18% (3,960 acres) of the JLUS area is developed for residential use, 12% (2,720 acres) are included within McConnell AFB and 7% (1,630 acres) involve industrial uses. Over 9,150 acres (42% of the JLUS area) are devoted to agricultural uses.

- The land included in 1994 Noise Contour Area (17,770 acres) is primarily used for agricultural (23%), residential (21%) and industrial (10%) purposes. McConnell AFB and other federal lands also account for a significant portion of this area (15%).

- The footprint of the 2004 Noise Contour Area (approximately 2,515 acres) is considerably smaller than the 1994 Noise Contour Area. It should be noted that the land area (approximately 390 acres) located in the two highest Noise Contours Areas (75-79 and 80 + dB) is entirely within McConnell AFB property. Other significant land uses within the 2004 Noise Contour Area involve agricultural (15%) and industrial (15%) activities.

- Unlike the noise contour boundaries, land areas in the Clear Zones (CZs) and Accident Potential Zones (APZs) remained unchanged from the 1994 AICUZ to the 2004 AICUZ. Of the approximate 2,600 acres in these two areas most of the property is used for agricultural (27%), industrial (17%) and McConnell AFB (15%) purposes. However, a major portion of this area also involves residential uses (15% or approximately 380 acres).

- Since 1995, 68 subdivisions on 1,775 acres of land have been approved within the JLUS area. In addition, according to County real property records, an estimated 2,718 dwelling units have been constructed in the JLUS area during the past 14 years. This rate of construction equates to about 157 dwelling units per year since 2001.

- The average price per acre of residential land sold has risen significantly over the past 14 years in both the JLUS area and the County. In the JLUS area the average price has risen by approximately $8,900 per acre, an increase of 374%, while the County's average increased by approximately $10,200, or 174%.

- Since 1995 a total of 948 acres have been subdivided within the land area associated with the 1994 Noise Contours Area. The majority of this subdivision activity has occurred within and adjacent to the City of Derby

- Since 1991, only 70 acres of land have been subdivided within the 2004 Noise Contour Area. Most of this development occurred within the DNL 65-69 dB noise range.

- Since 1995, 523 dwelling units have been constructed within the 1994 Noise Contour Area. Of particular concern are the 75 units constructed after 1995 in areas with noise exposure greater than DNL 75 dB. No units have been constructed in the 2004 Noise Contour Area since 1995.

- Since 1991, there have been essentially no approved subdivisions within the Clear Zone (CZ). However, the amount of land subdivided within the Accident Potential Zone (APZ) totals approximately 153 acres. Almost all of this development in the APZ areas has occurred in the APZ-II portion with the majority located south of the runways in and around the City of Derby.

D. Land Use Regulations Overview

- Land use development patterns within the JLUS and the AICUZ areas are the result of the combined effect of economic forces within the greater Wichita market area and the land use regulations that determine the type and amount

of development that can occur at various locations.

- The existing development patterns within the study area are strongly influenced by growth in the Cities of Wichita and Derby, their current zoning regulations and the availability of municipal water and sewer services.

- From a zoning perspective the JLUS area (about 22,000 acres) is predominantly zoned residential with 8,110 acres designated as medium/high density and 5,743 acres categorized as low density.

- The majority of the area contained within the 1994 Noise Contour Interval is zoned for residential uses. From an overall perspective of Base operations, the areas of concern relate to the approximately 6,340 acres of land that is zoned for medium and high density residential uses.

- The majority of the acreage contained within the 2004 Noise Contour Area is located on Base property and as such, does not present any potential land use conflicts.

- The City of Wichita and Sedgwick County have incorporated an Airport Overlay District (AOD) and an Airport Hazard Zone Code into the Unified Zoning Code. The City of Derby has not specifically adopted the AOZ, but has incorporated the same types of provisions into their base zoning districts that correspond to the APZ areas.

- Derby's Subdivision regulations (dated 1997) contain a provision that states that land located within established flight paths and noise impact areas of public-owned airports (including McConnell AFB) shall be required to grant a permanent avigation easement to the public, allowing aircraft to operate within these areas. Wichita and Sedgwick County have similar subdivision regulations. Although the subdivision regulations require that noise reduction measures be implemented during the construction of potentially affected homes or other structures, it appears as though there are no supporting standards in the area building codes to address these measures.

- Both Sedgwick County and Derby are currently involved in some long-range planning efforts such as 2030 Wichita Functional Land Use Guide Map, preparation of long-range transportation plans, and the updating of Derby's Comprehensive Plan. Possible development related impacts on McConnell AFB should be considered in preparing these various planning documents.

From an overall land use perspective, there are several major observations that are apparent based on this analysis. First, development within the Wichita city limits has an established, high density pattern of land use that is unlikely to be significantly altered in the future. Second, the rate of development within the study area has been moderate over the last decade and actually slowed even further within the last several years. However, there is a significant supply of developable land available that is being steadily converted in an incremental fashion and could increase the potential for future conflicts over a long-term period. These potential conflicts are not likely to be diminished by the current long-term growth plans presently being evaluated within the undeveloped portions of the study area.

From a regulatory standpoint this report has noted that important zoning and land use regulations were adopted by the cities and the county a number of years ago. These regulations are designed to protect the accident areas and larger noise contour footprint delineated for the 1994 AICUZ study. There are some loopholes in these regulations that can easily be remedied, but there are apparently no building code construction standards in place to support these underlying land use procedures. Perhaps the larger issue with regard to regulatory issues is the varying degree to which they seem to be implemented throughout the development approval process. There is also some question as to whether or not there is sufficient disclosure information being provided during real estate transactions located within the 1994 AICUZ areas. If these regulatory and disclosure measures are not applied consistently, it may be very difficult to preserve the land area that will be critical for limiting potential conflicts that could arise if future missions of McConnell AFB require a return to previous levels of aircraft operations.

For additional information about the McConnell AFB Joint Land Use Study contact Dave Barber, Chief Planner, Advanced Plans Division, Wichita-Sedgwick County MAPD, (316) 268-4490, e-mail: dbarber@wichita.gov

McConnell Air Force Base Joint Land Use Study Summary - Progress Report #2

Derby-Wichita-Sedgwick County, Kansas April 12-13, 2005

INTRODUCTION

In 1985 the U.S. Department of Defense (DoD) instituted a cooperative process referred to as a Joint Land Use Study (JLUS) Program to evaluate land use and development trends on property adjacent to active military facilities. This handout represents a summary of the second of two progress reports completed as part of the McConnell Air Force Base (AFB) Joint Land Use Study. During the past several decades the U.S. Department of Defense (DoD) has become increasingly concerned about the impacts of land development adjacent to military installations. Across the country incompatible residential and commercial development patterns have created conflicts between the operation and training missions of military bases and local communities. These land use conflicts, often referred to as encroachment, could eventually threaten public safety and livability due to a wide variety of concerns, such as aircraft noise, associated with military operations. The JLUS is used to identify actions that could be taken by a community and military installation to solve existing problems and prevent future ones.

The JLUS is normally initiated at military bases with aviation facilities after the completion of an Air Installation Compatible Use Zone (AICUZ) study which examines possible noise and safety impacts associated with aviation activities. An update of the McConnell AFB AICUZ study was completed in 2004.

The second Progress Report, which is summarized here, addressed three primary tasks that included the following.

- Identification of land use and aviation conflicts that presently exist based on current operations associated with McConnell's existing mission status.
- An evaluation of growth potential in the Study Area with regard to land development and aviation activities. This was used to identify potential conflicts that could occur with McConnell's current mission or mission requirements that could evolve within the foreseeable future.
- Finally, a series of recommendations and alternative actions were identified to address potential conflicts related to McConnell's continuing mission.

The major factor that makes developing a strategy for minimizing conflicts related to McConnell's mission somewhat complex is that the mission may change in the future as it has in the past. In 2002, the mission of McConnell AFB changed from operating B-1, C-12, and F-16 aircraft to operating KC-135 aircraft. Aircraft operations related to the previous mission are referred to as the ***maximum mission capability*** for McConnell since they most likely represent the highest level of activity, as well as the largest noise impact area, reasonably expected to occur at the facility. The current operations associated with KC-135 aircraft are referred to as the ***existing mission***. The extent of both mission areas is illustrated in Figures 1 and 2 on the center page of this summary.

A primary requirement of this JLUS study was to develop a land use strategy for minimizing potential future conflicts with McConnell's maximum mission capability even though there is presently no need for regulating the larger noise impact area based on the existing mission activities. Although it is possible there may be a return to the maximum mission, as well as other missions that may vary from the existing mission, there is no certainty as to if or when such a change might occur. Therefore, it will be necessary to consider alternative land use strategies that allow for flexibility in land development and management activities around McConnell if it is determined that preservation of the installation's maximum mission capability is an important goal for the community to pursue.

SUMMARY OF MAJOR FINDINGS AND CONCLUSIONS

A. Study Area Background Information

- This Joint Land Use Study (JLUS) progress report contains an analysis of future land use development and aviation trends for four individual study areas.
  - The Joint Land Use Study Area (JLUSA), which contains over 22,200 acres and represents the local area of influence around McConnell.
  - The 2004 AICUZ noise contour area, which contains approximately 2,515 acres **(the existing mission area)**.
  - The 1994 AICUZ noise contour area, which encompasses approximately 17,777 acres **(the maximum mission area)**.
  - The Clear Zones (CZ) and Accident Potential Zones (APZ), which have a combined total of approximately 2,618 acres **(included in both the existing and maximum mission areas)**.

- The two central issues related to land use compatibility around McConnell AFB are safety and noise, where the fundamental principles of compatibility criteria are limit exposure of people and noise sensitive activities to high level noises, and limit concentrations of people and safety sensitive activities in areas of highest probable accident impact. These standards are defined in the federal Land Use Compatibility Guidelines (LUCG).

- Examples of land uses that are susceptible to higher noise levels (e.g. greater than 65dB) include: residences and places were people sleep, such as hotels, hospitals, and nursing homes as well as uses such as schools, libraries, churches, museums, theaters, and offices.

- Land uses that result in concentrations of people that are incompatible with high hazard zones, which include the Clear Zone and APZ-I and APZ-II, include: high density residential uses, hotels or nursing homes; employment uses with high density of employees; and uses where people gather in large numbers such as churches, schools, shopping centers, restaurants, and spectator sports

B. Existing Mission: Land Use and Aviation Conflicts

- The majority of existing development considered to conflict with McConnell's existing mission activities is located north of the Base in the portions of the CZ and APZ areas located within the City of Wichita. It is estimated that there are approximately 1,900 dwelling units located in the northern APZ-II area as well as two hotels and a school that are considered incompatible land uses.

- Also located in the northern APZ area (APZ-I) are an additional 180 dwelling units and a nursing home. Some existing industrial buildings are situated in the Clear Zone that are considered incompatible land uses as well. The LUCGs recommend that essentially no structures of any type be located in the CZ areas.

- South of the Base the only land use identified as incompatible is a manufactured housing park, containing approximately 45 dwelling units, located in the APZ-I area. This neighborhood is located in an unincorporated portion of Sedgwick County.

- Noise exposure is a function of the number of flights and the types of aircraft flown. When McConnell's prevalent aircraft was the B-1, it resulted in the creation of noise contours that affected a much larger area around the Base. The noise generated from a single operation of the B-1 is much greater than that of the C-12 or KC-135 currently flown at the Base.

- A review of civilian aircraft operations related to Colonel James Jabara Airport, Beech Factory Airport, Mid-Continent Airport, and Cessna Aircraft Field, did not reveal any aviation related conflicts with McConnell's existing mission.

C. Future Development Potential

- Growth projections for the JLUSA and AICUZ areas indicate that a slowing in the rate of growth, as compared to that which occurred over the last decade, is expected to occur over the next thirty years.

- Housing growth in the JLUSA is projected to increase by less than one percent (0.6%) annually, on average, over the next 25 years and result in the creation of approximately 3,000 dwelling units in addition to the 16,800 existing units.

- Employment growth in the JLUSA is expected to increase at a slightly higher rate of 0.74% annually, on average, through 2030. This would represent a net increase in employment of approximately 5,600 jobs between 2000 and 2030, a growth rate of about 25%. Current employment in the Study Area totaled approximately 22,900 as of 2000.

- It is estimated there are approximately 10,000 acres of undeveloped land remaining within the JLUSA as of

2004. The majority of this acreage represents existing agricultural land. Some of the 10,000 acres have already been subdivided but have not yet been developed with structures.

- McConnell's airfield configuration (with parallel runways) has considerable capacity to increase the existing number of flight operations (approximately 70,000 as of 2003). One estimate places the potential Annual Service Volume (ASV) between 260,000 and 370,000 operations based on assumptions about aircraft fleet mix, weather conditions, runway use patterns, percent of touch and go operations, and various other inputs. Based on these assumptions, an increase in aircraft operations and introduction of louder aircraft operating at McConnell would likely create a higher level of noise impact that could be similar to those experienced when the B-1 was operating at the facility.

- There is approximately 1,080 acres of potentially developable land remaining in the CZ and APZ areas, about 700 acres of which are located at the south end of the Base.

- Growth projections within the existing mission area are relatively modest with only 10 additional dwelling units anticipated between 2000 and 2030, although it is likely the actual number will be somewhat higher. Employment growth in this area is placed around 560 additional employees during this time period.

- Sedgwick County's zoning ordinance controls development in the CZ/APZ areas by means of the Airport Overlay (A-O) zoning district. The City of Derby has incorporated provisions into its B-5 zoning district that lies within the boundaries of the southern APZ area.

- The provisions of these regulations are generally aligned with the LUCG recommended standards for compatible uses in these areas.

- Projected growth within the maximum mission area between 2000 and 2030 is expected to result in the construction of an additional 520 dwelling units, based on current zoning parameters. This represents a 3% increase and an average annual growth rate of 0.1% which is considerably slower than the projected rate for the JLUSA as whole (0.74%).

- Projections of non-residential growth within the maximum mission area estimate that an additional 3,400 employees will be located in this area over the next 30 years, based on regional traffic model forecasts.

- Potential future land use conflicts, which could result from a return to McConnell's maximum mission status, are related to the remaining 1,080 acres of undeveloped land in the CZ/APZ areas, as well as the additional 4,000 acres within the 1994 noise contour footprint.

- Regional plans being considered for long-term future growth within the JLUSA and maximum mission area envision a mixture of high density employment centers (commercial/industrial uses) and residential uses. It is conceivable that implementation of this land use plan could result in the development of the remaining undeveloped land around McConnell as an extension of Wichita's and Derby's high density urbanized areas.

- Protecting McConnell from potential security issues related to terrorism will require a holistic and cooperative approach between the military and community officials and representatives that is part of a systematic planning implementation process.

D. Land Use Recommendations

The crux of developing a preferred land use plan that addresses the current mission, but that also keeps open the potential for expanded mission requirements, is the lack of, or uncertainty, about the time frame in which a change in mission status could materialize. Currently, there is no definitive answer to this question. In order to address this issue, a two-pronged approach is being recommended for establishing a preferred land use plan around McConnell that includes both a short-term and a long-term strategy. The short-term strategy includes actions for preserving the existing mission area as well as an interim strategy for evaluating development potential within the maximum mission area. The long-term recommendations relate only to the maximum mission area and should be considered, if warranted by a change in McConnell's mission over the next two to three years.

Existing Mission Recommendations

The preferred land use plan for supporting the existing mission should focus on implementing a strategy designed to minimize development within the Clear Zones (CZ) and Accident Potential Zones (APZ). Addressing this issue is of primary importance for the existing mission but it would also serve to support the maximum mission capability as well.

1. **Continue to use and revise current regulatory requirements** to manage growth within the CZ/APZ areas through the Airport Overlay zoning district with some revisions to existing standards to comply with LUCGs.
2. **Consider amending building codes to institute noise level reduction measures** as recommended in the LUCGs for the remaining 390 acres of undeveloped land within the 2004 Noise Contour Area.

3. **Negotiate agreement with Cessna Aircraft Company** – Sedgwick County and/or the City of Wichita should initiate discussions with the Cessna Aircraft Company with the intent of restricting future development on the approximately 340 acres of undeveloped land owned by the company in the northern Clear Zone and APZ-I area.
4. **Establish a real estate disclosure process** to notify prospective buyers that they are purchasing property in an area that is susceptible to noise impacts.
5. **Consider initiating land protection/acquisition in CZ/APZ areas** in order to minimize potential land use conflicts in the CZ/APZ and reduce long-term cumulative impacts of development in these areas.
6. **Allow flexibility in implementing proposed future land use plan/rezoning process** currently proposed by the Metropolitan Area Planning Department (MAPD) over the next two to three years or until such time as a more definitive determination is reached regarding the long-term status of possible future missions at McConnell.
7. **Address security concerns** that could potentially occur due to land use development within a predetermined perimeter around McConnell AFB that establishes a cooperative review process, which includes representatives of McConnell AFB, the City of Wichita, Sedgwick County and the City of Derby.

Maximum Mission Recommendations – (Short-Term)

Short-term recommendations for preserving the maximum mission capability include all of the actions presented above that are intended to support the existing mission. The reason for this similarity is that recommendations related to the existing mission are primarily focused on minimizing land use conflicts within the CZ/APZ areas, which are equally important for the maximum mission operations as well. **A key consideration in managing future land use in the maximum mission area involves the fact that even if land use compatibility guidelines are implemented over the long-term, higher densities of development that are being considered could still result in cumulative levels of growth that have negative impacts on the continuing viability of operations at McConnell.**

Maximum Mission Recommendations – (Long-Term)

Long-term recommendations for minimizing land use conflicts that could potentially affect McConnell's maximum mission capability focus on the remaining undeveloped land within the 1994 Noise Contour Area. These recommendations would only be implemented if it is determined, within the next two to three years, that McConnell's mission status will be expanded and that such a change would involve a return to aircraft operations that affect land within the larger 1994 AICUZ area.

1. **Regulate land use activities** during the interim period through application of the LUCG standards within the 1994 Noise Contour Area. This could be accomplished by imposing the Protective Overlay (P-O) zoning regulations in the Wichita-Sedgwick County zoning code and using the LUCGs as a basis for reviewing development proposals within this area. Application of the LUCG standards would regulate the types of uses in specific areas related to noise level intensities, and also require that noise mitigation techniques be incorporated into the construction of buildings.
2. **Consider purchase of noise-sensitive areas** as an alternative to regulatory methods for preserving land within the maximum mission noise contours. Fee-simple purchase of noise-impacted land is the most permanent form of land-use control that could be considered.
3. **Acquire easements for noise-sensitive areas** as an alternative to fee-simple acquisition of land. The acquisition of easements could be applied to all or portions of the undeveloped land within the 1994 Noise Contour Area. Easements can be an effective and permanent form of land-use control.
4. **Use transfer of development rights (TDR) to manage location of future development** - The TDR concept involves transferring some of the property's developmental rights to another location where they may be used to intensify allowable development. With TDR, for example, lands within an installation's noise-impacted area could be kept in open space or agricultural areas and their developmental rights for residential uses transferred to locations outside the area.
5. **Consider land banking of land in maximum mission area.** The term "land banking" is defined as a system in which an entity, such as the local governing body, acquires a substantial amount of land available for future development within a given region for the purpose of implementing a public land use policy. Land banking differs from permanent acquisition in that it places the land in a temporary holding status to be turned over for development at a future date.
6. **Consider public/private leaseback of land to control types of development permitted** - Leaseback is a financial arrangement in which the land is acquired and controlled, but not necessarily occupied, by the owner. The leaseback arrangement typically involves a two-step process where the real estate is purchased by either a private firm or government entity and then leased back to the firm or government entity by the purchaser for specific uses in accordance with the approved plan for the area.

For additional information about the McConnell AFB Joint Land Use Study contact Dave Barber, Chief Planner, Advanced Plans Division, Wichita-Sedgwick County MAPD, (316) 268-4490, e-mail: dbarber@wichita.gov