2. INSTALLATION DESCRIPTION

2.1 Description and Population Data

Dyess AFB is located in the City of Abilene, adjacent to the City of Tye.

Dyess AFB consists of approximately 5,366 acres in Taylor County, in north-central Texas (see **Figure 2-1**). The installation is within the city limits of the City of Abilene and is adjacent to the City of Tye. As shown in **Table 2–1**, the population in the City of Abilene is considerably larger than the population in the City of Tye. Consequently, the greatest population density around Dyess AFB is to the northeast. In the past several years, the populations of the cities of Tye and Abilene and Taylor County have grown at a slower pace than the rest of Texas. Between 1990 and 2007 the population of the City of Abilene grew by more than 9,600, a 9.1 percent increase, and the population of the City of Tye grew by 55, a 5.1 percent increase. The population of Taylor County grew by more than 6,800, a 5.8 percent increase. Aircraft noise from Dyess AFB also affects southern Jones County, whose population grew by more than 2,800 from 1990 to 2007, a 17.0 percent increase. This growth was at a slower pace than the rest of Texas, which grew by more than 6.9 million, a 40.7 percent increase, in the same timeframe.

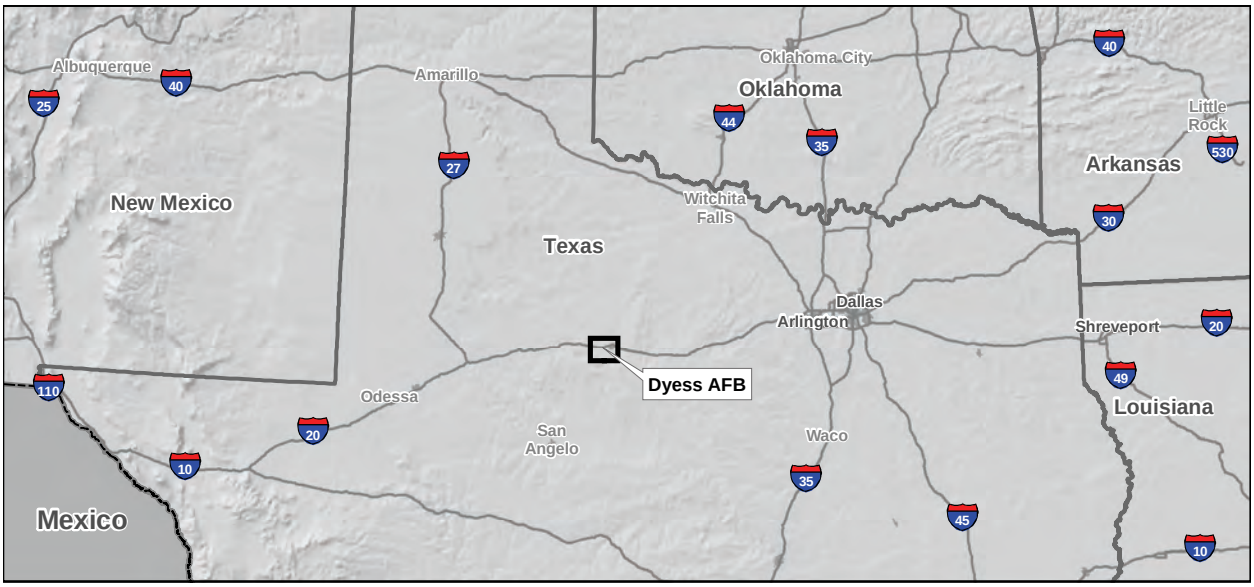
Table 2-1. U.S. Census Bureau Population Data

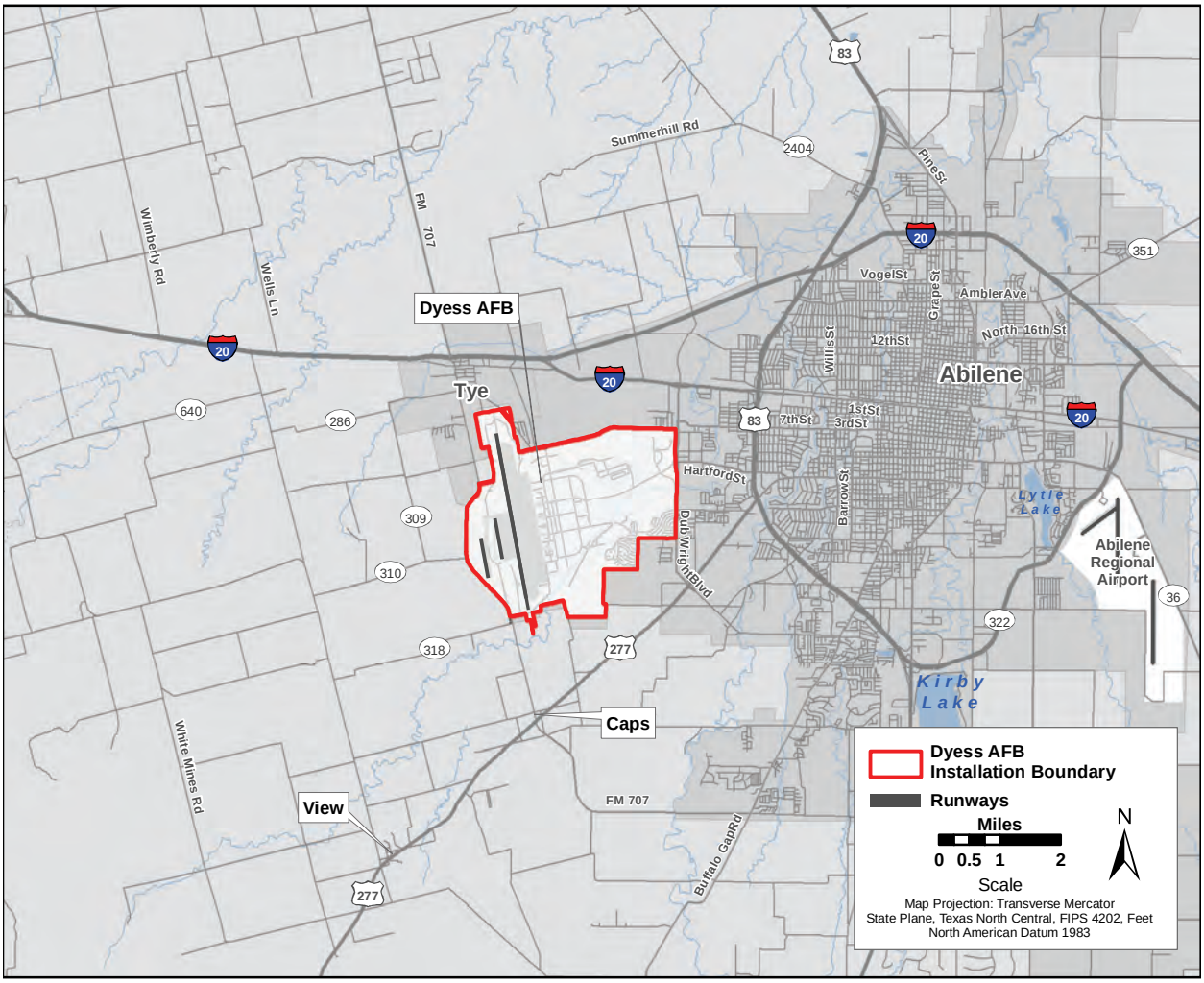
	2007 Population Estimate	1990 Population	Percent Increase
City of Abilene	116,219	106,564	9.1
City of Tye	1,143	1,088	5.1
Taylor County	126,540	119,655	5.8
Jones County	19,295	16,490	17.0
Texas	23,904,380	16,986,510	40.7

Source: U.S. Census Bureau 2008

The 7th Bomb Wing (7 BW) is headquartered at Dyess AFB, Texas, and is assigned to the 12th Air Force (12 AF), which is headquartered at Davis-Monthan AFB, Arizona. The 7 BW is a component of Air Combat Command (ACC), headquartered at Langley AFB, Virginia. The 7 BW is the host unit at Dyess AFB and operates B-1B aircraft and is the USAF's only B-1B formal training unit. Groups assigned to the wing include the 7th Operations Group, the 7th Maintenance Group, the 7th Mission Support Group, and the 7th Medical Group. The 7th Operations Group is responsible for executing global conventional bombing and is the USAF's largest B-1B operations group. Four squadrons are assigned to the 7th Operations Group: the 9th Bomb Squadron and 28th Bomb Squadron (9 BS and 28 BS), the 436th Training Squadron (436 TS), and the 7th Operations Support Squadron (7 OSS). In addition, the 7 BW provides host-unit support for the 317th Airlift Group (317 AG) also stationed at Dyess AFB.

36 B-1B aircraft are assigned to the 7 BW at Dyess AFB.





Source: ESRI StreetMap USA 2005

Figure 2-1. Dyess AFB Vicinity Map

The 317 AG is a tenant unit of the 7 BW and is under the operational control of the 18th Air Force and Air Mobility Command (AMC) at Scott AFB, Illinois. The 317 AG operates C-130 aircraft in support of tactical airlift requirements worldwide. The 317 AG is composed of the 39th Airlift Squadron and 40th Airlift Squadron (39 AS and 40 AS), 317th Aircraft Maintenance Squadron, 317th Maintenance Squadron, 317th Operations Support Squadron, and the 317th Maintenance Operations Squadron.

The airfield at Dyess AFB is composed of a primary runway (Runway 16/34), two landing zones (LZs) (paved and unpaved), taxiways, an aircraft parking apron, and three test cells. These key areas of the installation are shown on **Figure 2-2**.

2.2 History

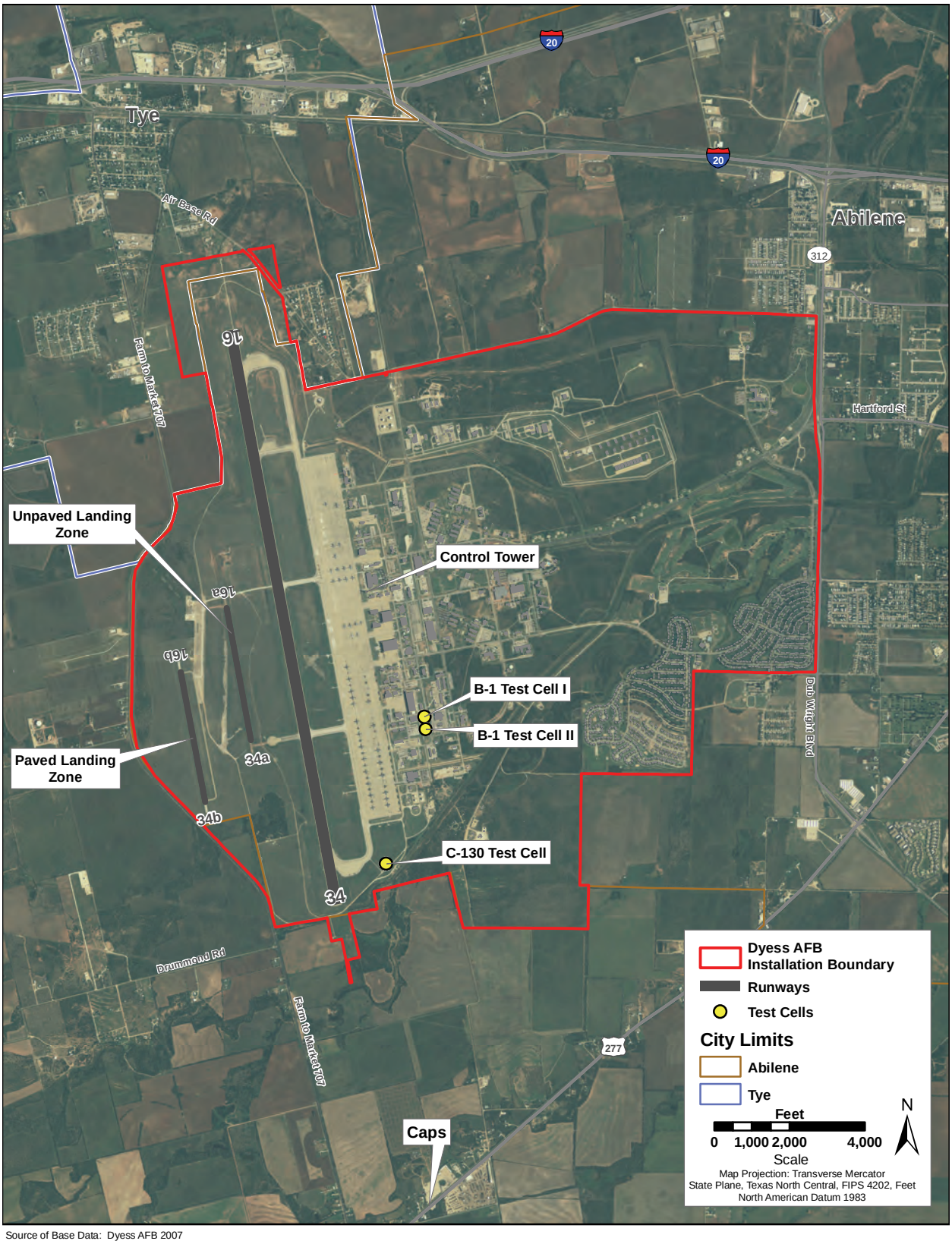
The history of Dyess AFB is important in understanding the fluctuations in the noise environment in the areas surrounding the installation.

Prior to its construction as a military base, the present Dyess AFB property was farm and range land. The installation's history began in 1942 as Tye Army Airfield, which was used for pilot training. The airfield was operated at the present site as an extension of Camp Barkeley, which is several miles southwest of Abilene. A few wooden structures were constructed, but the installation was never intended as a permanent facility.

Following the end of World War II in 1945, the airfield was closed and the deed to the land was sold to the City of Abilene. From 1947 to 1952, 1,500 acres of the former airfield were used by the Texas State National Guard as a training facility. Following the outbreak of the Korean conflict, the City of Abilene offered the original 1,500 acres plus an additional 3,500 acres the city had purchased to the DOD as a site for a new military base. In July 1952, Congress approved the construction of a Strategic Air Command (SAC) base in Abilene that was named Abilene AFB, and construction began the following year.

The first unit was activated at Abilene AFB in 1955. The first aircraft arriving at Abilene AFB in 1956 were B-47 bombers and KC-97 tankers. Eventually, B-52 and KC-135 aircraft were assigned to the base. In 1956 the base was renamed Dyess AFB in honor of Lt. Col. William Edwin Dyess. From 1961 to the present, troop carrier activities have taken place at Dyess AFB, first under Tactical Air Command (TAC), then Military Airlift Command, and now under AMC and ACC. In February 1961, the 64th Troop Carrier Wing under TAC was assigned to Dyess AFB, utilizing C-130 *Hercules* aircraft. The B-52 aircraft assigned to Dyess AFB were replaced by the USAF's first operational B-1 aircraft in June 1985. SAC and TAC were combined on 1 June 1992 to create ACC. ACC is the primary provider of air combat forces to America's warfighting commanders.

The 7th Group was originally activated at Carswell AFB, Texas, in 1946 and the wing flew a wide variety of aircraft. On 1 October 1993, the 7th Group was deactivated at Carswell AFB and activated as the 7th Wing at Dyess AFB. The 7th Wing flew both the C-130 *Hercules* aircraft and the B-1B *Lancer* aircraft. This unique structure of bombing and airlift under one wing



Source of Base Data: Dyess AFB 2007

Figure 2-2. Dyess AFB Installation Map

remained intact until 1 April 1997, when the USAF transferred all C-130 aircraft to AMC.

The transfer of all U.S.-based C-130 aircraft to AMC in 1997 resulted in the reactivation of the 317 AG. The 317 AG had been flying C-130 aircraft for TAC since 1957, but was inactivated at Pope AFB, North Carolina, in July 1993 when the USAF streamlined their operations. The 317 AG was reactivated at Dyess AFB on 1 April 1997 and took control of all the C-130 aircraft from the 7th Wing, and the 7th Wing was reorganized as the 7th Bomb Wing on that day. The 317 AG currently operates as a tenant unit of the 7 BW within the ACC. The 7 BW is currently the premier operational B–1B unit in the USAF.

2.3 Mission

As an ACC installation, Dyess AFB fulfills the ACC's mission as the primary provider of combat air forces to America's unified combatant commands. The 12 AF, with headquarters at Davis-Monthan AFB, Arizona, controls ACC's conventional fighter and bomber forces that include the 7 BW, the host unit at Dyess AFB. The mission of the 7 BW is "to provide world class airman and airpower for the warfighter" (DAFB 2006). The 7 BW accomplishes this mission by developing and maintaining operational capability for ACC's largest B-1 bomb wing; delivering global power to support Joint Chiefs of Staff tasking for the joint/combined application of conventional air power worldwide; producing combat-ready aircrews in the USAF's only B-1 formal training unit; and providing aviation, logistics, base support, and medical infrastructure.

The 9 BS and the 28 BS operate under the 7 BW. The 9 BS maintains combat readiness to deliver rapid, decisive airpower on a large scale in support of conventional warfare tasks. The 9 BS is the oldest active bomb squadron in the USAF and its most recent combat involvement was during Operation Enduring Freedom. The 28 BS is the largest bomb squadron in the USAF and the largest flying squadron in ACC. Its primary mission is to provide initial B-1 qualification, requalification, and instructor training for ACC. The squadron also maintains conventional combat readiness supporting higher headquarters contingency taskings worldwide.

The 317 AG utilizes C-130 *Hercules* aircraft at Dyess AFB to support intra–theatre tactical transports. The mission of the 317 AG is to transport personnel and equipment into combat zones. The 317 AG is also often involved in humanitarian disaster relief and emergency evacuations of American nationals from troubled areas of the world. Since December 2003, the 317 AG has been in a continuously deployed status in support of Operations Iraqi Freedom and Enduring Freedom, as well as other contingencies around the world.

2.4 Economic Impact

Table 2-2 shows the factors that influence Dyess AFB's total economic impact on the City of Abilene and the local area for Fiscal Year (FY) 2007.

The installation's economic impact includes total gross payroll for Dyess AFB personnel, the total actual annual expenditures of the installation, and the estimated annual value of jobs created by Dyess AFB.

Table 2-2. Dyess AFB's Economic Impact for FY 2007

Personnel Category	Total Personnel	Total Gross Payroll
Active-Duty Military	4,884	$232.7M
Subtotal Military Personnel	*4,884*	*$232.7M*
Military Dependents	6,906	N/A
Appropriated Fund Civilians	412	$19.5M
Nonappropriated Fund Civilians and Private Business	412	$8.1M
Subtotal Nonmilitary Personnel	*7,730*	*$27.6M*
Retired Military Personnel in Dyess Vicinity	3,493	$81.5M
Total Personnel	**16,107**	**$341.8M**
Estimated Annual Value of Jobs Created	$53.1M	
Local Annual Expenditures	$51.9M	
Total Economic Impact	**$446.8M**	

Source: DAFB 2007

Note: Some numbers in the table are rounded and include the 2007 economic impact on the City of Abilene and the local area only.

Approximately 4,884 active-duty military personnel are employed at Dyess AFB, which includes members of the USAF, U.S. Army, U.S. Navy, and U.S. Marines. Of this amount, 4,166 personnel live off-installation, which accounts for the majority of the personnel that work at Dyess AFB. In addition, there are 11,223 military dependents, retired military, and nonmilitary personnel supported through Dyess AFB.

The total annual payroll for employees at Dyess AFB was more than $341.8 million in FY 2007. The majority of this amount ($206 million) was paid to active-duty military employees living off-installation. Approximately 88 percent of the military personnel at Dyess AFB who live off-installation reside in Abilene and 99 percent reside in Taylor County (DAFB 2007). Dyess AFB is the City of Abilene's largest employer (Abilene Chamber of Commerce 2004).

In addition to the payroll, the installation's total expenditures in FY 2007 came to more than $76 million, with $51.9 million going to local Abilene expenditures. Dyess AFB contributed to the local economy through such expenditures as $36.7 million in construction, services such as the installation's medical construction and health care for $3.9 million, and educational assistance for $2.8 million. Other expenditures such as the commissary, base exchange, and government charge card purchases account for $8.5 million.

Dyess AFB's location in north-central Texas has resulted in the creation of approximately 1,770 jobs in the area with an estimated annual value of more than $53 million. Combined with the installation's gross payroll and annual expenditures this brings the total economic impact of Dyess AFB on the surrounding area to more than $446 million in FY 2007.

2.5 Flying Activity

To describe the relationship between aircraft operations and land use, it is necessary to fully understand the exact nature of flying activities. An inventory has been made of such information as the aircraft based at Dyess AFB, where those aircraft fly, how high they fly, how many times they fly over a given area, and at what time of day they operate. Military flying operations can be qualified as a sortie, operation, or a closed pattern. A sortie is the entire mission of a military aircraft that includes the arrival, departure, and any closed-pattern activities. An operation is defined as a single aircraft movement, such as an arrival or a departure. A closed pattern accounts for two operations, an arrival and a departure. Pilots commonly use closed patterns to practice takeoffs and landings, and closed patterns usually remain close to the airfield.

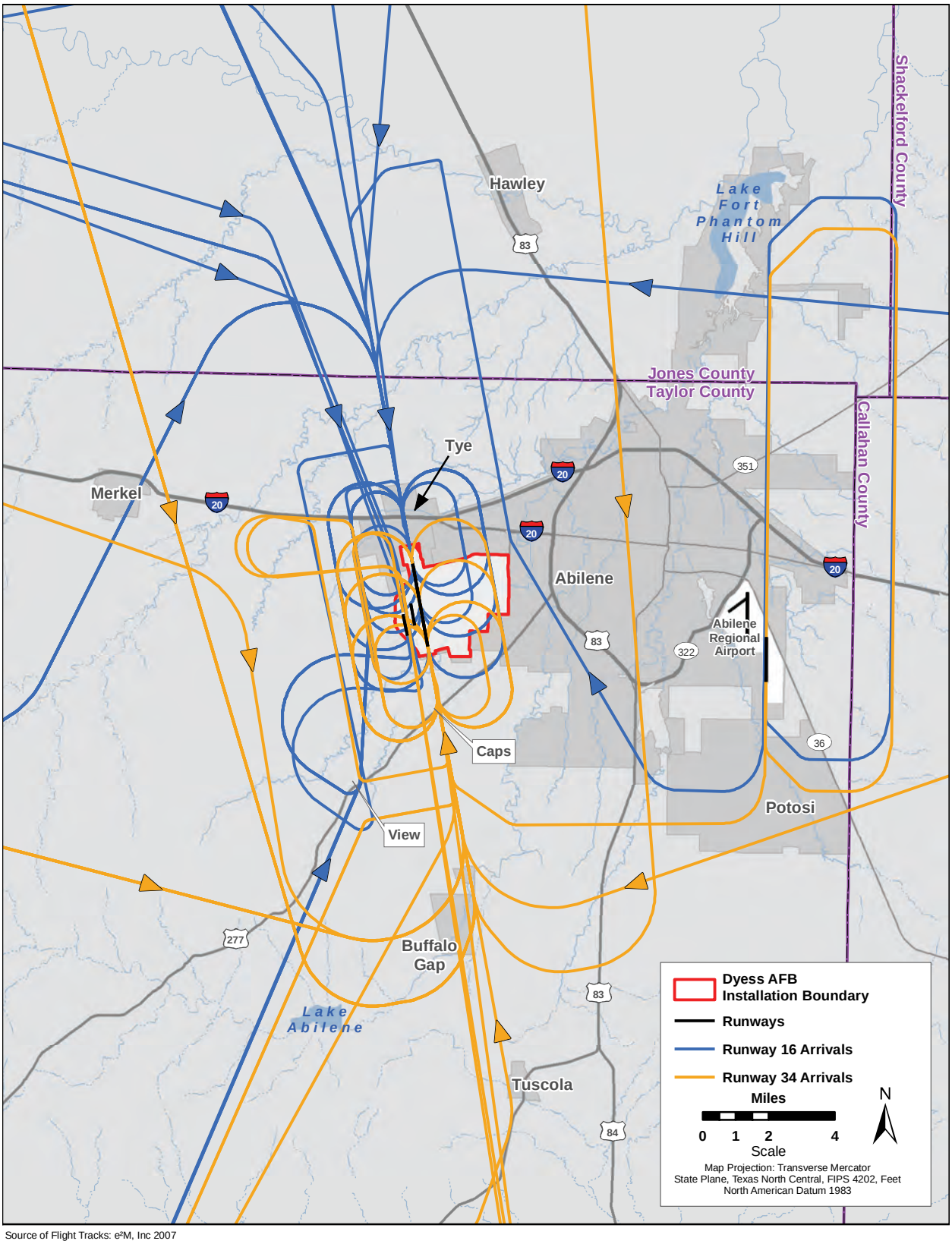
2.5.1 Airfield and Airspace Management

Airfield and airspace environs management is concerned with three primary aircraft operational/land use determinants: (1) hazards to operations from land uses (e.g., height obstructions), (2) aircraft noise, and (3) accident potential to land users. Each of these concerns is addressed in conjunction with mission requirements and safe aircraft operation to determine the optimum flight track for each aircraft type. Data for the 2008 AICUZ Study were provided according to flight track (i.e., where they fly), flight profile (i.e., how they fly), flight occurrence (i.e., how often they fly), and ground run-up (i.e., engine maintenance activities). The flight tracks depicted in **Figures 2-3**, **2-4**, and **2-5** are the result of this data collection.

Section 3 presents a detailed description of APZs and current noise zones.

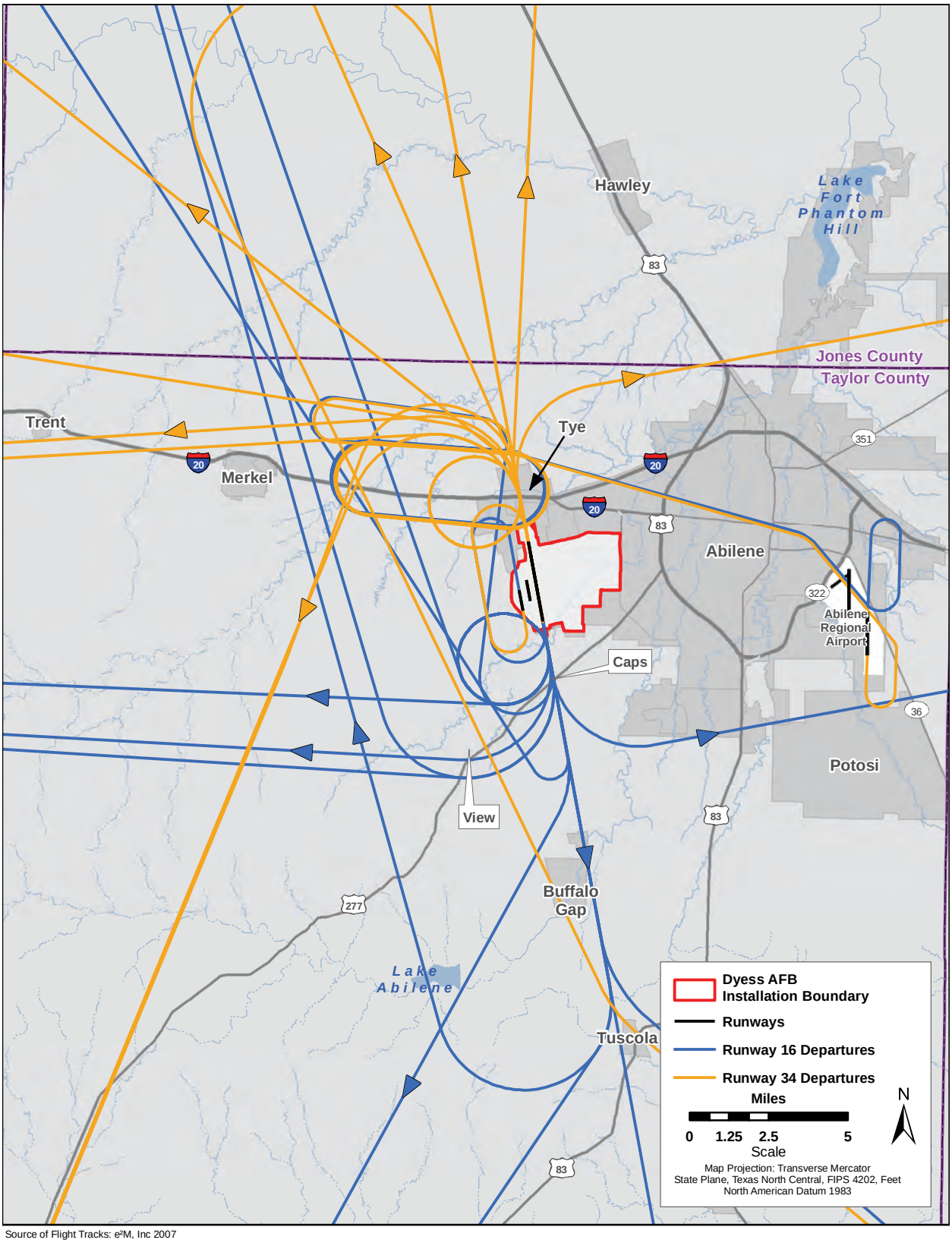
2.5.1.1 Regional Airspace

Abilene Regional Airport lies approximately 10 miles east of Dyess AFB. Abilene Regional Airport and Dyess AFB have a shared Class C controlled airspace. Class C airspace can generally be described as controlled airspace that extends from the surface or a given altitude to a specified higher altitude, normally 4,000 feet above ground level. Class C airspace is designed and implemented to provide additional Air Traffic Control (ATC) into and out of primary airports that have an operational control tower, that have radar approach capability, and where aircraft operations are periodically at high–density levels. All aircraft operating within Class C airspace are required to maintain two-way radio communication with the ATC facilities.



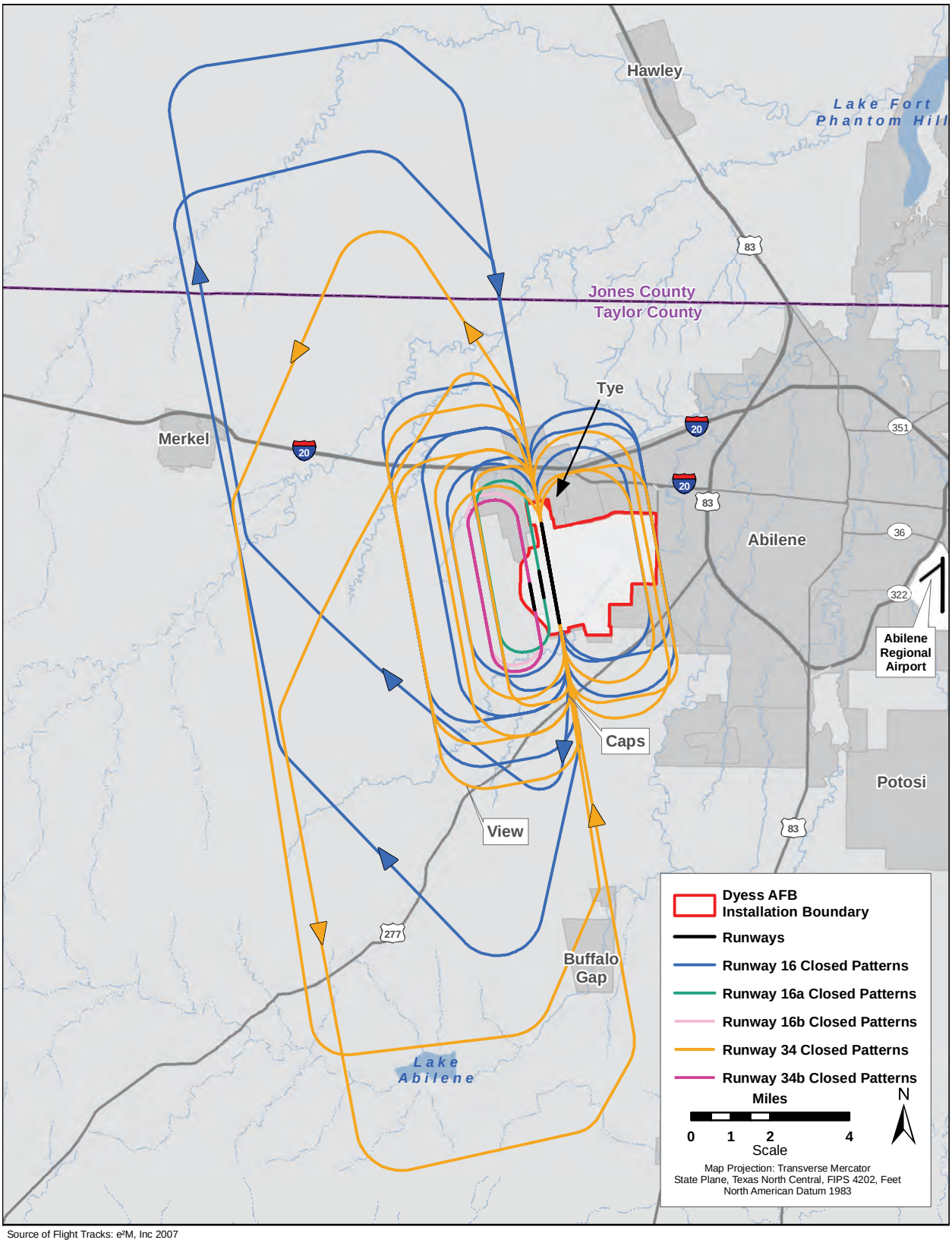
Source of Flight Tracks: e²M, Inc 2007

Figure 2-3. Arrival Flight Tracks



Source of Flight Tracks: e²M, Inc 2007

Figure 2-4. Departure Flight Tracks



Source of Flight Tracks: e²M, Inc 2007

Figure 2-5. Closed-Pattern Flight Tracks

2.5.1.2 Dyess AFB Airfield

Runway Use. The primary runway at Dyess AFB, Runway 16/34, is oriented in a north/south direction and measures 13,500 feet long by 300 feet wide. Runway 16/34 was designed and constructed for sustained landings and takeoffs. In addition, there are two LZs, which are west of Runway 16/34 (see **Figure 2-2**). The paved LZ is Runway 16b/34b; the unpaved LZ is Runway 16a/34a. Each LZ is 3,500 feet long by 60 feet wide (AirNav 2007). LZ 16b/34b was constructed to support short field C-130 operations, while LZ 16a/34a is a dirt landing strip that is used infrequently. Both LZs are used exclusively by C-130 aircraft.

The approach to Runway 16 is on the northwestern side of the airfield and the approach to Runway 34 is on the southeastern side of the airfield. Aircraft arriving and departing at the airfield use Runway 16 approximately 67 percent of the time and Runway 34 approximately 33 percent of the time. Operations on the LZs are always conducted in the same direction as those on the primary runway. Runway use is driven by wind direction. Pilots prefer to take off and land facing into the wind.

Flight Patterns. The flight patterns in **Figures 2-3**, **2-4**, and **2-5** represent the way that aircraft arrive, depart, and perform closed-pattern operations at Dyess AFB. As shown in **Figures 2-3** and **2-4**, aircraft arrive and depart at Dyess AFB from the various directions. Aircraft also arrive and depart to Abilene Regional Airport, which is east of the installation. The majority of closed-pattern operations are flown to the west of Runway 16/34 and the LZs, which are west of the City of Abilene. Most of the flight tracks have been routed to correspond with wind direction, to avoid air traffic from Abilene Regional Airport, and to minimize exposure to populated areas to the greatest extent possible. Aircraft crews try to minimize exposure to populated areas, but depending on the weather conditions and air traffic, these areas cannot always be avoided.

Maintenance Engine Run-ups. Maintenance engine run-ups occur at test cells and at various locations around the airfield. Often engine run-ups are performed on the aircraft apron just outside maintenance hangars. A test cell is used to perform high-power aircraft engine checks, typically after a maintenance procedure, to assess the operating condition and performance of the engine. Test cells can be located in unenclosed areas or in an enclosed space with the use of a suppressor to minimize noise. Dyess AFB utilizes three test cells, the two B-1B test cells are east of the primary runway and the C-130 test cell is directly east of Runway 34 (see **Figure 2-2**). The B-1B test cells are equipped with suppressors; the C-130 test cell does not have a suppressor.

Flying activities at Dyess AFB are described by unit and include the 7 BW and the 317 AG as well as transient activities. Flight track and profile data were updated in May 2007.

2.5.2 7th Bomb Wing Operations

The multimission capable B-1B Lancer is the backbone of America's long-range bomber force. It can rapidly deliver large quantities of precision and non-precision weapons against any adversary, anywhere in the world, at any time.

The 7 BW consists of the 9 BS, the 28 BS, the 436 TS, and the 7 OSS. There are 36 B1-B aircraft assigned to the 7 BW, 14 of which are assigned to the 9 BS and 22 to the 28 BS. The 7 BW conducts operations Monday through Friday for a total of 260 flying days per year and approximately 45.80 daily operations. Please see **Section 2.5** for the definition of an operation. Multiplying 71.54 daily operations times 260 flying days per year equates to approximately 18,600 operations flown by the 7 BW in 2007.

As shown on **Table 2-3**, there was an average of 10 arrivals, 10 departures, and 25.77 closed pattern operations per day for the 7 BW in 2007. Day operations occur between the hours of 7:00 a.m. to 10:00 p.m. and night operations occur from 10:00 p.m. to 7:00 a.m. Dyess AFB personnel limit night flying to the minimum required to accomplish their mission and maintain required proficiencies. Night flying is more difficult due to reduced visibility and requires training to maintain currency and safety. Approximately 55 percent of arrivals and 65 percent of closed pattern operations occurred during the day; therefore, approximately 45 percent of arrivals and approximately 35 percent of closed pattern operations occurred at night. All 7 BW departures occurred during the day.

Table 2-3. Average Busy Day Operations for the 7 BW

	Arrivals	Departures	Closed Patterns	Total
Day (7 a.m. to 10 p.m.)	5.53	10.00	16.73	**48.99**
Night (10 p.m. to 7 a.m.)	4.47	0	9.04	**22.55**
Total	**10.00**	**10.00**	**25.77**	**71.54**

Note: Total daily operations = arrivals + departures + (2 x closed patterns).

2.5.3 317th Airlift Group Operations

The C-130 Hercules primarily performs the tactical portion of the USAF's airlift mission. The aircraft is capable of operating from rough, dirt strips and is the prime transport for air dropping troops and equipment into hostile areas.

The 39 AS and 40 AS are assigned to the 317 AG. Both the 39 AS and 40 AS operate 16 C-130 aircraft for a total of 32 C-130s assigned to Dyess AFB. The 317 AG conduct operations Monday through Friday for a total of 260 flying days per year and approximately 257.86 daily operations. This equates to approximately 67,044 operations flown in 2007 by the 317 AG.

As shown on **Table 2-4**, based C-130 aircraft averaged 12 arrivals, 12 departures, and 116.93 closed pattern operations per day in 2007. Approximately 62 percent of arrivals and 60 percent of closed-pattern operations occurred during the day; therefore, 38 percent of arrivals and 40 percent of closed pattern operations occurred at night. The vast majority (94 percent) of 317 AG departures occurred during the day.

Table 2-4. Average Busy Day Operations for the 317 AG

	Arrivals	Departures	Closed Patterns	Total
Day (7 a.m. to 10 p.m.)	7.43	11.24	70.72	**160.11**
Night (10 p.m. to 7 a.m.)	4.57	0.76	46.21	**97.75**
Total	**12.00**	**12.00**	**116.93**	**257.86**

Note: Total daily operations = arrivals + departures + (2 x closed patterns).

2.5.4 Transient Aircraft Operations

T-38A aircraft performed the highest number of transient aircraft operations at Dyess AFB in 2007. The T-38A is a twin-engine, high-altitude, supersonic jet trainer used in a variety of roles because of its design, economy of operations, ease of maintenance, high performance, and exceptional safety record.

Over the course of a year, numerous military transient aircraft arrive, depart, and perform closed-pattern operations at Dyess AFB. **Table 2-5** shows a representative sample of transient aircraft that operate out of Dyess AFB. Since a large variety of transient aircraft frequent Dyess AFB, the remaining aircraft that perform transient operations have been grouped under "other."

As shown in **Table 2-5**, there was an average of 2.88 arrivals, 2.88 departures, and 2.90 closed-pattern transient operations per day in 2007. The vast majority of transient operations occur during the day. There are 0.21 transient night operations per day, which accounts for approximately 2 percent of the total number of transient operations.

Table 2-5. Representative Sample of Average Busy Day Transient Aircraft Operations at Dyess AFB

	Arrivals	Departures	Closed Patterns	Total
C-130H, C-130N, and C-130P				
Day (7 a.m. to 10 p.m.)	0.28	0.28	0	**0.56**
Night (10 p.m. to 7 a.m.)	0.01	0.01	0	**0.02**
F-15A				
Day (7 a.m. to 10 p.m.)	0.20	0.20	0	**0.40**
Night (10 p.m. to 7 a.m.)	0	0	0	**0**
T-1				
Day (7 a.m. to 10 p.m.)	0.12	0.12	0.37	**0.98**
Night (10 p.m. to 7 a.m.)	0.01	0.01	0.01	**0.04**
T-38A				
Day (7 a.m. to 10 p.m.)	1.00	1.00	2.50	**7.00**
Night (10 p.m. to 7 a.m.)	0	0	0.02	**0.04**
Other				
Day (7 a.m. to 10 p.m.)	1.19	1.19	0	**2.38**
Night (10 p.m. to 7 a.m.)	0.07	0.07	0	**0.14**
Total	**2.88**	**2.88**	**2.90**	**11.56**

Note: Total daily operations = arrivals + departures + (2 x closed patterns).

3. LAND USE CONSTRAINTS AND COMPATIBILITY GUIDELINES

The DOD developed the AICUZ Program for military airfields. Using this program, DOD works to protect aircraft operational capabilities at its installations and to assist local government officials in protecting and promoting public health, safety, and quality of life. The goal is to promote compatible land use development around military airfields by providing information on aircraft noise exposure and accident potential.

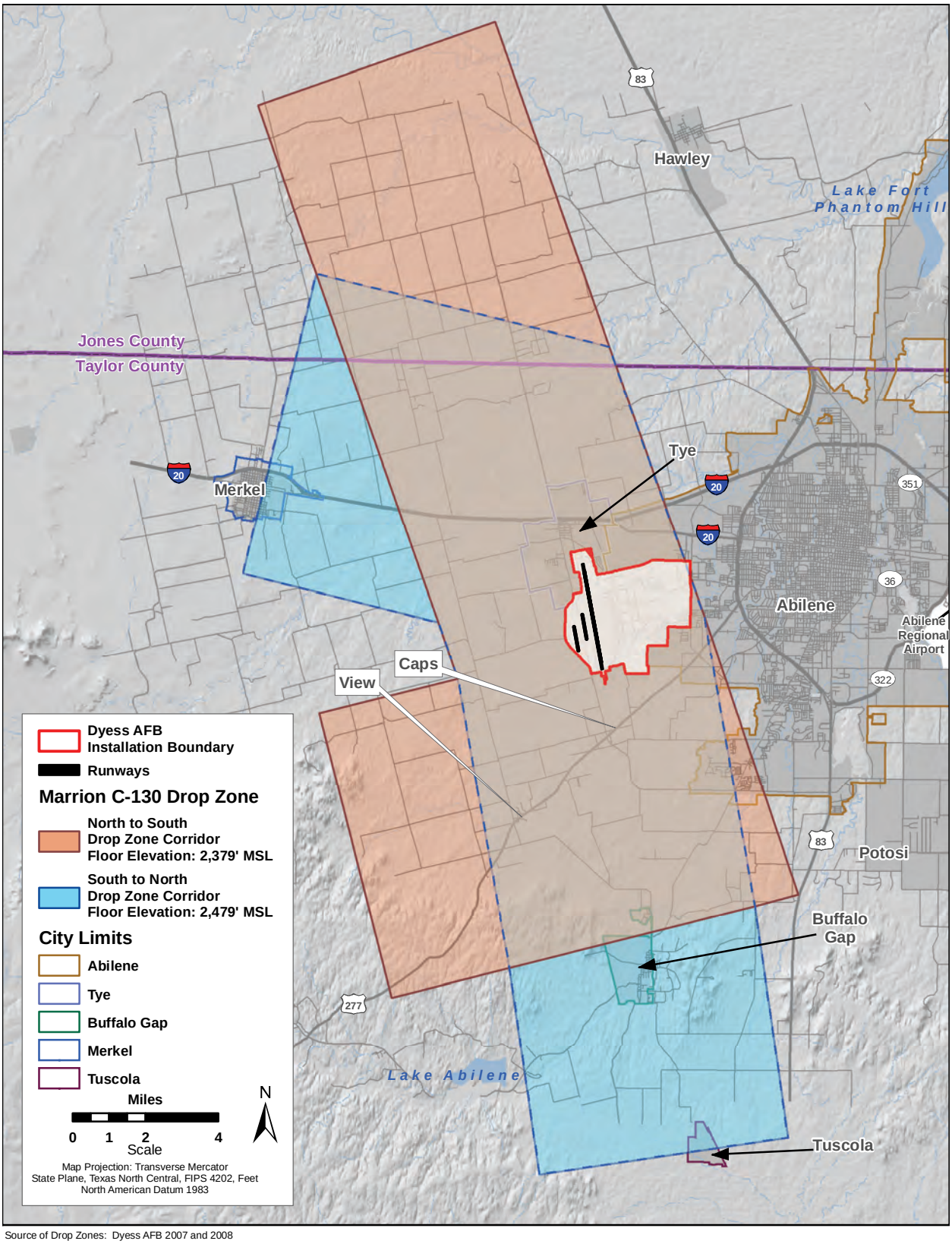
Airfield planning is concerned with three constraints:
1. *Height obstructions*
2. *Aircraft noise*
3. *Accident potential.*

An AICUZ Study describes three basic types of constraints that affect, or result from, flight operations. The first constraint involves areas that the FAA and DOD have identified for height limitations (see Height and Obstruction Criteria in **Appendix D**). USAF obstruction criteria are based upon those contained in Federal Aviation Regulation Part 77, Subpart C. These obstruction criteria are defined for all military airfields regardless of the current flying mission. Dyess AFB has additional height obstruction limitations that are driven by an on-base aerial drop zone and rising terrain to the south of the installation (see **Figure 3-1**). The height restrictions are to prevent man-made structures from creating an obstruction that could prevent aircraft from accessing airports or pose an accident hazard. Aircraft approach and depart from airports on a vertically sloped flight path that gets farther from the ground as distance from the airport increases. The height obstruction criteria reflect this principle, and permit the placement of taller structures as distance from the airport increases. This does not hold true, however, for the rising terrain south of Dyess AFB.

The second constraint involves noise zones associated with aircraft operations. Using the NOISEMAP program, DOD uses aircraft operations data to generate noise contours showing the noise exposure levels generated by these aircraft operations. The DNL around Dyess AFB is depicted visually as noise contours created by connecting points of equal value. Noise contours connect the points of the same noise exposure level, in much the same way as ground contours on a topographic map visually represent lines of equal elevation. Noise contours are plotted in 5-dBA increments from the airfield, ranging from a DNL of 65 dBA up to 80 dBA, and are overlaid on a map of the airport vicinity. The area encompassed by a noise contour is known as a noise zone. Additional information on the AICUZ methodology is presented in **Appendix A** and additional information on noise methodology is contained in **Appendix C** of this AICUZ Study.

The third constraint involves Accident Potential Zones (APZs) based on statistical analysis of past DOD aircraft accidents. DOD analyses have determined that the areas immediately beyond the ends of runways and along the approach and departure flight paths have significant potential for aircraft accidents. Based on this analysis, DOD developed three zones that have high relative potential for accidents: Clear Zones (CZs) and APZs I and II.

Urban areas around airports are exposed to the possibility of aircraft accidents even with well-maintained aircraft and highly trained aircraft crews.



Source of Drop Zones: Dyess AFB 2007 and 2008

Figure 3-1. Drop Zone Corridors for Dyess AFB