U.S. AIR FORCE

AIR INSTALLATIONS COMPATIBLE USE ZONES STUDY

MacDILL AIR FORCE BASE, FL | 2023

PREPARED FOR

6th Air Refueling Wing
6th Civil Engineer Squadron

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DEPARTMENT OF THE AIR FORCE
6TH AIR REFUELING WING (ARW)
MACDILL AIR FORCE BASE, FLORIDA

MEMORANDUM FOR AREA GOVERNMENTS

FROM: 6 ARW/CC

SUBJECT: Air Installations Compatible Use Zones (AICUZ) Study

1. The 2023 AICUZ Study for MacDill Air Force Base (AFB) is an update of the installation's 2008 AICUZ Study. The Air Force initiated the update to include changes to municipal land use and zoning data, new noise contours based on anticipated aircraft changes, increased development surrounding the installation, and the introduction of the Hazards to Aircraft Flight Zone area of consultation. The Air Force provides this AICUZ study to aid in the development of local planning mechanisms that will protect the health, safety, and welfare of the public, as well as preserve the operational capabilities of MacDill AFB.

2. This AICUZ study contains a description of the affected area around the installation. It outlines the location of runway Clear Zones, Accident Potential Zones, and the operational noise footprint, and provides recommendations for development that is compatible with military operations. It is the Air Force's proposal that local governments incorporate these recommendations into community plans, zoning ordinances, subdivision regulations, building codes, and other related documents.

3. This study provides noise contours based upon the Day-Night Average Sound Level metric. Long-range planning by local land use authorities involves strategies to influence present and future uses of land. Due to the long-range nature of planning, the Air Force provides planning contours—noise contours based on reasonable projections of future missions and operations. AICUZ studies using planning contours provide a description of the long-term (5- to 10-year) aircraft noise environment for projected aircraft operations that is more consistent with the planning horizon used by state, tribal, regional, and local planning bodies.

4. The Air Force greatly values the positive relationship MacDill AFB has experienced with its neighbors over the years. As a partner in the process, the installation has attempted to limit noise disturbances by minimizing flights over heavily populated areas, schools, hospitals, and other noise-sensitive areas as much as possible. The Air Force appreciates and values the cooperation of all community stakeholders in the collaborative implementation of the recommendations and guidelines presented in this AICUZ study update.

ADAM D. BINGHAM
Colonel, USAF Commander

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FIGURES

TABLES

ABBREVIATIONS AND ACRONYMS

AAD	average annual day
ABD	average busy day
AFB	Air Force Base
AFH	Air Force Handbook
AFI	Air Force Instruction
AICUZ	Air Installations Compatible Use Zones
Air Force	United States Air Force
APZ	Accident Potential Zone
ARW	Air Refueling Wing
ATC	Air Traffic Control
BASH	Bird/Wildlife Aircraft Strike Hazard
CFR	Code of Federal Regulations
CHHA	Coastal High Hazard Area
CUD	compatible use district
CZ	Clear Zone
dB	Decibel
dBA	A-weighted Decibel
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DoDI	Department of Defense Instruction
EIS	Environmental Impact Statement
EMI	Electromagnetic Interference
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FAR	Floor Area Ratio (also Federal Aviation Regulation)
FY	fiscal year
GIS	Geographic Information System
HAFZ	Hazards to Aircraft Flight Zone
Hz	Hertz
JLUS	Joint Land Use Study
LED	Light-Emitting Diode
LU	land use
MSL	mean sea level
MOB 6	Main Operating Base #6
NLR	Noise Level Reduction
NVG	Night Vision Goggles
PA	Public Affairs
REPI	Readiness and Environmental Protection Integration
SLUCM	Standard Land Use Coding Manual
T&G	Touch-and-Go
TBDA	Tampa Bay Defense Alliance
UAS	Unmanned Aircraft System
USAF	United States Air Force
USCENTCOM	U.S. Central Command
USSOCOM	U.S. Special Operations Command
WWII	World War II

1

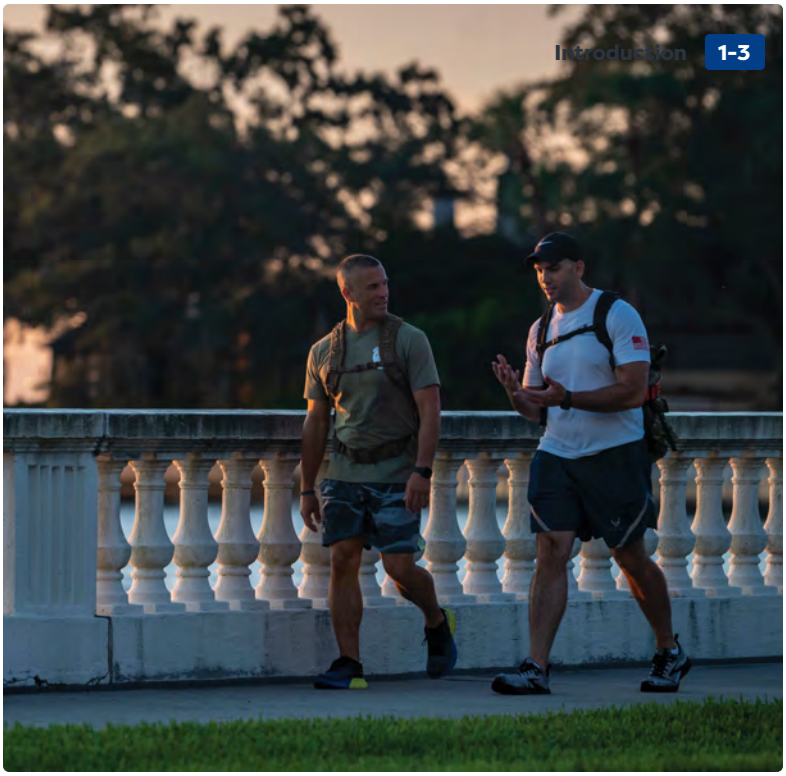
1 INTRODUCTION

The 2023 MacDill Air Force Base (AFB) Air Installations Compatible Use Zones (AICUZ) Study focuses on the flying missions at MacDill AFB. This update presents and documents changes primarily to the surrounding land use and zoning information since the previous AICUZ study, released in 2008. It reaffirms the United States Department of the Air Force's policy of promoting public health, safety, and general welfare in areas surrounding an air installation while seeking development that is compatible with the defense mission. This study provides planning noise contours and recommendations for compatible land use.

1.1 AICUZ PROGRAM

Military installations attract development; people who work on an installation want to live nearby, while others want to provide services to installation employees and residents. When incompatible development occurs near an installation or training area, affected parties within the community may seek relief through political channels that could restrict, degrade, or eliminate capabilities necessary to perform the defense mission. In the early 1970s, the U.S. Department of Defense (DoD) established the AICUZ Program. The goal of the program is to protect the health, safety, and welfare of those living and working near air installations, while sustaining the Air Force's operational mission. The Air Force accomplishes this goal by promoting proactive, collaborative planning for compatible development to sustain its mission and meet community objectives.

The AICUZ Program recommends that local land use agencies incorporate noise zones, Clear Zones (CZs), Accident Potential Zones (APZs), and Hazards to Aircraft Flight Zones (HAFZs) associated with military operations into local community planning programs to maintain the airfield's operational requirements, while minimizing any impact to residents in the surrounding community. Cooperation between military airfield planners and their community-based counterparts serves to increase public awareness of the importance of air installations and the need to address mission requirements and associated noise and risk factors in the public planning process. As the communities that surround airfields grow and develop, the Air Force has the responsibility to communicate and collaborate with local governments on land use planning, zoning, and similar matters that could affect the installation's operations or missions. Likewise, the Air Force has a responsibility to understand and communicate potential impacts that new and changing missions may have on the local community.



1.2 SCOPE AND AUTHORITY

1.2.1 SCOPE

The Air Force provides MacDill AFB's CZs, APZs, and noise zones associated with the airfield's runways to the local communities, along with recommendations for compatible land use near the installation, for incorporation into comprehensive plans, zoning ordinances, subdivision regulations, building codes, and other related documents.

1.2.2 AUTHORITY

Authority for the Air Force AICUZ Program lies in two documents:

- **Air Force Instruction (AFI) 32-1015,** *Integrated Installation Planning,* implements Department of Defense Instruction (DoDI) 4165.57, Air Installations Compatible Use Zones, and applies to all Air Force installations with active runways located in the U.S. and its territories. This AFI outlines the program objectives and responsibilities.
- **Air Force Handbook (AFH) 32-7084,** *AICUZ Program Manager's Guide,* provides installation AICUZ Program Managers with specific guidance concerning the organizational tasks and procedures necessary to implement the AICUZ Program. It is written in a "how-to" format and includes the land use compatibility tables used in AICUZ studies.

1.3 PREVIOUS AICUZ EFFORTS AND RELATED STUDIES

Previous studies relevant to this AICUZ study include:

- *MacDill Air Installations Compatible Use Zones (AICUZ) Study (2008).*
- *City of Tampa/MacDill Air Force Base Joint Land Use Study (JLUS) (2006).*
- *Draft Environmental Impact Statement (EIS) for the KC-46A Main Operating Base #6 (MOB 6) Beddown at MacDill Air Force Base, Florida or Fairchild Air Force Base, Washington (2023)*

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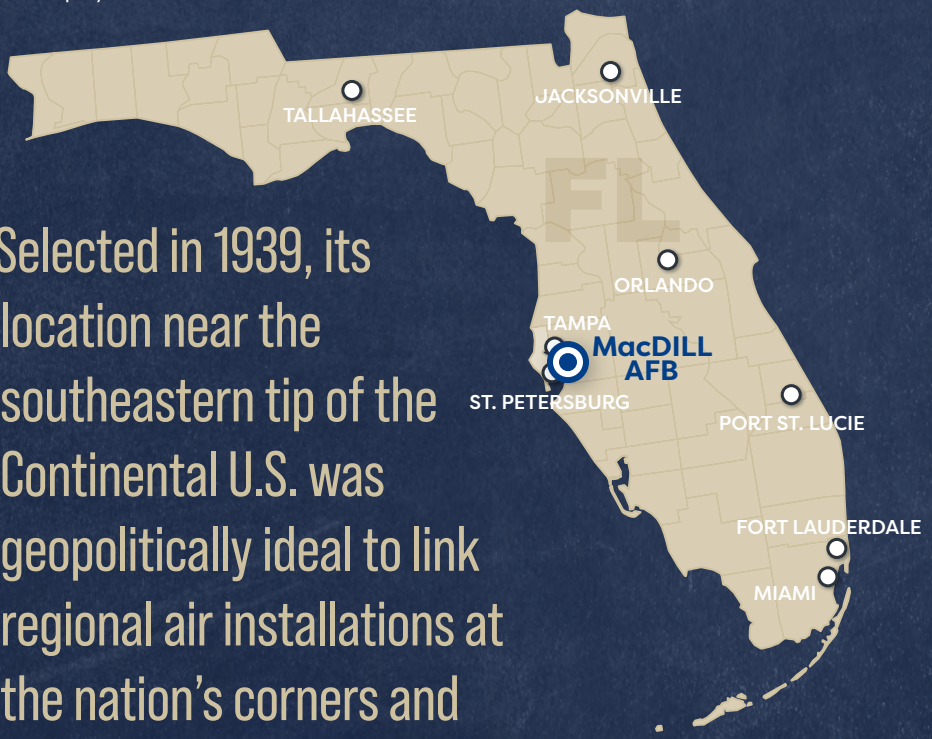
2 MACDILL AFB, FLORIDA

2.1 LOCATION

Situated at the southern end of Hillsborough County on the tip of the Interbay Peninsula, MacDill AFB encompasses 5,767 acres of land. Being located on a peninsula, the installation is surrounded on three sides by water and only directly abuts the City of Tampa to the north **(see Figure 2-1).** MacDill AFB is also within the Hillsborough County City-County Planning Commission (the Planning Commission), which serves as the metropolitan planning organization for Hillsborough County (including the City of Tampa).



"Selected in 1939, its location near the southeastern tip of the Continental U.S. was geopolitically ideal to link regional air installations at the nation's corners and beyond."

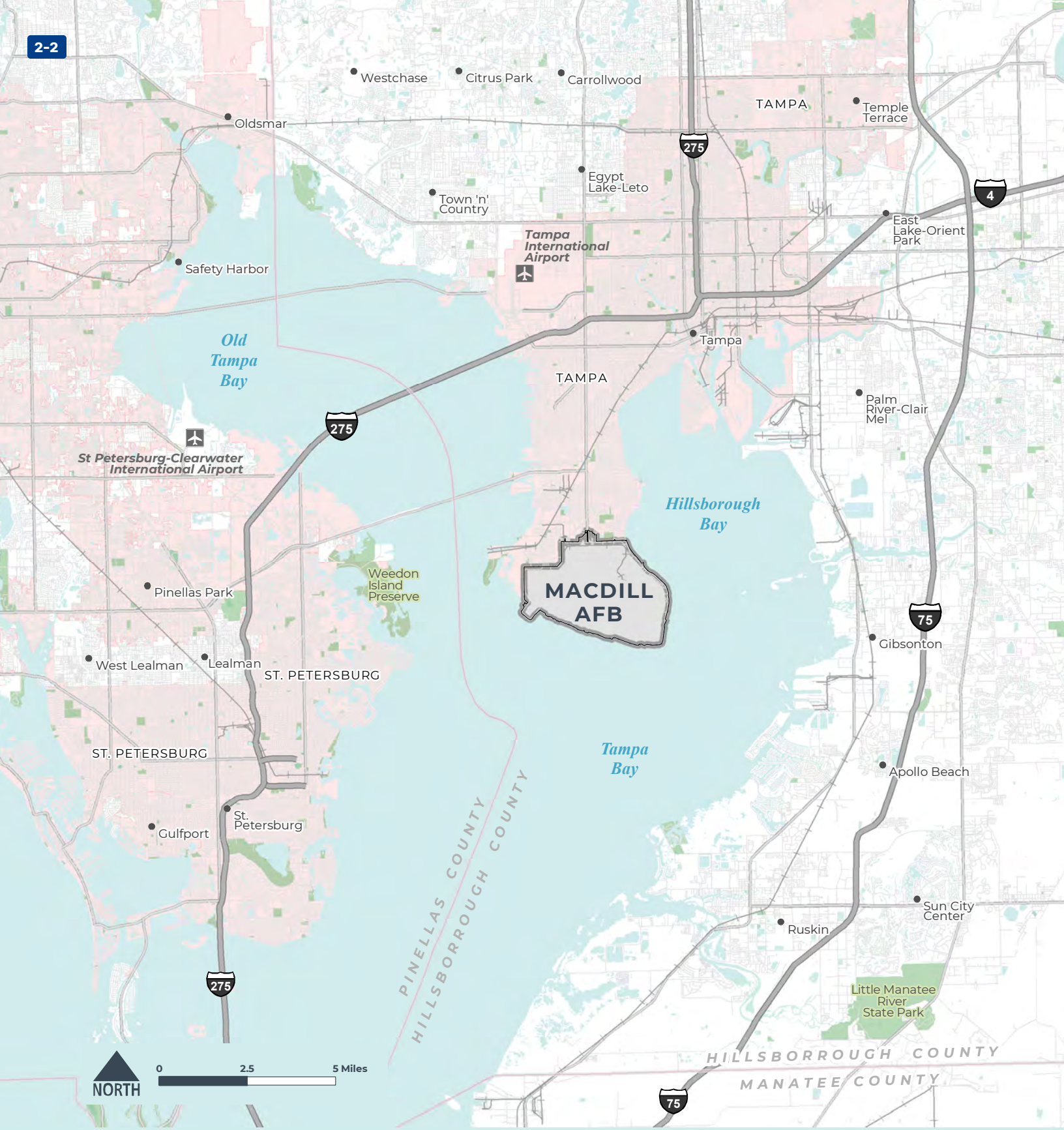


Figure 2-1 Regional Setting, MacDill AFB

2.2 HISTORY

In the late 1930s, the U.S. Army Air Corps decided to establish its newest and most modern facility, Southeast Air Base, to be built just south of Tampa, Florida. Selected in 1939, its location near the southeastern tip of the Continental U.S. was geopolitically ideal to link regional air installations at the nation's corners and beyond. It was also a utilitarian decision, as the mostly vacant land was surrounded on three sides by the waters of Tampa Bay and was in an area with year-round flying weather, excellent transportation connections, and a ready supply of housing in nearby Tampa. Southeast Air Base soon became MacDill Field, in honor of the World War I aviator and aeronautical engineer, Airman Lieutenant Colonel Leslie MacDill, who lost his life fielding new aircraft. MacDill Field was dedicated on April 17, 1941, during World War II (WWII).

AIRMAN LIEUTENANT COLONEL LESLIE MACDILL

An Army aviation pioneer and World War I veteran, Colonel Leslie MacDill perished in a November 1938 plane crash while testing a new U.S. Army Air Corps training aircraft in Washington, D.C.

During WWII, MacDill Field, which was engineered to station the Air Force's big bombers, answered the call for replacements. Over its first five years, the base's population grew to a city of thousands and spanning over 4,500 acres. To harness America's full fighting capacity, MacDill Field's population of American servicemen, under the command of a Native American, Brigadier General Clarence Tinker, became more diverse, soon joined by Black troops and servicewomen, military and civilian, and even captured enemy prisoners of war.

Although defined by its achievements protecting America's shores and preparing bomber crews for battle in WWII, for the next 75 years, MacDill AFB sustained its contribution to America's defense in myriad ways. It has seen many changes and survived several closure attempts, which resulted in dramatic changes to the base's mission. After the creation of an independent U.S. Air Force in 1947, the newly renamed "MacDill Air Force Base" continued the fight. MacDill AFB has deployed bomber crews to Europe, Africa, and Asia to deter the Soviet Union and punish communist forces in North Korea. After reasserting its geopolitical value on the front lines during the Cuban Missile Crisis, MacDill AFB launched its next life as a fighter base and home of its first combatant command, U.S. Strike Command. From 1963 to 1993, MacDill AFB prepared fighter pilots for combat in conflicts from Vietnam in Southeast Asia to Iraq in Southwest Asia.

MacDill AFB then transitioned from being primarily a fighter base to serving as an important link in America's global reach, providing aerial refueling capacity to span the Southeast U.S. and the world. Joining that capacity with those of its major mission partners, such as U.S. Central Command (USCENTCOM), U.S. Special Operations Command (USSOCOM), Reserve Associate 927th Air Refueling Wing (ARW), and 31 other tenant organizations, MacDill AFB's daily impact spread across dozens of the DoD's most important mission sets that reach every corner of the globe.

F-4s at MacDill AFB (1973).

MacDill AFB also has a long and strong history of developing other commands within the installation across a variety of branches. In 1961, the DoD established a novel joint command, U.S. Strike Command, and made MacDill AFB the home for its headquarters in a single surplus dormitory. This unified command integrated personnel and assets from the Air Force, Navy, Marine Corps, and Army into a fighting force capable of responding to global crises without resorting to nuclear weapons.

The growth of major combatant command headquarters itself spawned sub-headquarters at MacDill AFB, a transition which began to shift the character of the base from an Air Force-centric installation to one serving all its joint and coalition partners. The Rapid Deployment Joint Task Force, forerunner of today's USCENTCOM, was activated at MacDill AFB in 1980. In 1987, USSOCOM was formally established as a combatant command at MacDill AFB. The same day it activated, USSOCOM took over the personnel and facilities left behind by the inactivation of the U.S. Readiness Command headquarters at MacDill AFB.

U.S. SPECIAL OPERATIONS COMMAND MEMBERS FLY OVER TAMPA BAY, FLORIDA, in a U.S. Army MH-60 helicopter during a U.S. Special Operations Command capabilities demonstration.

2.3 MISSION

MacDill AFB is an Air Mobility Command installation whose host wing—the 6th ARW—provides air refueling capabilities worldwide. The 6th ARW is organized into four groups that provide support activities to mission partners such as air refueling, responsive airlift, and airbase support. MacDill AFB is home to 34 mission partners, such as USCENTCOM and USSOCOM, and its partners include not only Air Force personnel but many soldiers, sailors, Marines, and coast guardsmen. Because of this, MacDill AFB personnel often refer to themselves as "Team MacDill."

This AICUZ study discusses only those units that could affect neighboring communities or that could be affected by community growth—primarily those that have an aircraft operation mission; therefore, not all tenant organizations are discussed.

2.4 HOST AND TENANT ORGANIZATIONS

6th AIR REFUELING WING. As the host unit for MacDill AFB, the 6th ARW operates the airfield, maintains all its infrastructure, and provides security, communications, air traffic control (ATC), and public affairs (PA), among many other services. As noted above, the overall mission of the 6th ARW is to generate and execute air refueling and contingency response capabilities while providing base support for joint, coalition, and interagency partners, including USCENTCOM and USSOCOM. The 6th ARW executes this mission with 24 KC-135 aircraft, which may transition to KC-46 aircraft, and 3,000 professional airmen.

927th AIR REFUELING WING. The 927th ARW is an Air Force Reserve Command associate wing. The 927th ARW consists of three groups and 10 squadrons whose responsibilities include flying, aeromedical evacuation, security forces, logistical readiness, force support, aeromedical staging, aircraft maintenence, maintenance, aerospace medicine, and an operational support squadron.

159th AVIATION REGIMENT. The U.S. Army Reserve operates the UH-60 Blackhawk helicopter out of MacDill AFB. The unit is assigned to the 5th Battalion, 159th Aviation Regiment, Alpha Company and conducts various training operations and exercises in and around MacDill AFB. The regiment's UH-60 helicopters provide medical evacuation and battlefield transportation services and members have seen action in Afghanistan, Iraq and elsewhere.

2.5 AIRFIELD ENVIRONMENT

The airfield environment at MacDill AFB includes aircraft hangars for maintenance and storage, an ATC tower, aircraft parking ramps and taxiways, the runway, assorted office buildings, ramp space for engine run ups, and other support facilities **(see Figure 2-2).**

Runway 05/23 is the only fixed-wing runway at MacDill AFB and is oriented 050 degrees to 230 degrees magnetic; it is 11,421 feet long and 151 feet wide and a Class B runway. The runway also has overruns on each end that are approximately 995 feet long. The airfield elevation is 14 feet above mean sea level (MSL).

A runway is typically used in both directions and is counted as two separate runways, depending on the direction of the departure or arrival. Each direction is labeled as a separate runway and numbered based on its magnetic heading, divided by 10 and rounded to a whole number.

Figure 2-2 Airfield, MacDill AFB


ACKSON
U.S. AIR FORC

2.6 LOCAL ECONOMIC IMPACTS

The military provides direct, indirect, and induced economic benefits to local communities through jobs and wages. Benefits include employment opportunities and increases in local business revenue, property sales, and tax revenue. MacDill AFB is a major employer and economic driver in the Greater Tampa Bay Area, with over 30,844 personnel on direct payroll (24,125 military and 6,519 civilian) as well as approximately 16,334 jobs created indirectly through MacDill AFB's economic impact in the Greater Tampa Bay Area **(see Table 2-1).**

The economic impact of a military installation on a local community is based on annual payroll (jobs and salaries), annual expenditures, and the estimated annual dollar value of the jobs created. The military further contributes to the economic development of communities by generating increased demand for local goods and services and increased household spending by military and civilian employees associated with an installation.

With the employment data presented in **Table 2-1** for FY19, MacDill AFB boasts an annual federal payroll of $2.5 billion, split between approximately $2 billion in military payroll and $500 million in civilian payroll. MacDill AFB also generates approximately $586 million in other local expenditures and a retiree and surviving spouses' economic impact of over $1 billion. Overall, the total MacDill AFB economic impact is estimated at $3.9 billion **(see Table 2-2).** Although the retiree and surviving spouses' contribution is not typically a part of an installation's economic impact methodology, it is mentioned here to note the tremendous impact it has on the local community, which, when combined, would equate to nearly $5 billion in total economic impact annually.

"...it is well documented that the military's presence—specifically at MacDill AFB—has a significant positive impact on the local community."

TABLE 2-1

MacDill AFB Fiscal Year (FY) 2019 Employment

Direct Employment, FY19	Number of Jobs
Federal Civilian	6,519
Federal Military	24,125
Total Direct Employment	**30,844**
Indirect and Induced Employment	16,334
Estimated Total Employment (Direct, Indirect, and Induced)	**47,178**

Source: MacDill Air Force Base, 2019 Economic Impact Statement, FY19.



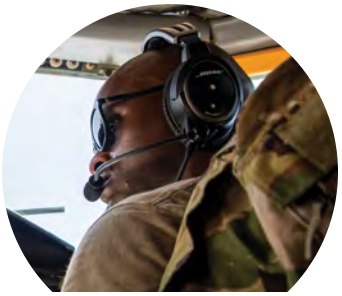



TABLE 2-2

MacDill AFB Economic Impact (FY19)

Expenditure Category (In Millions of Dollars)	FY19
Payroll	
Military Payroll	$1,998.3
Civilian Payroll	$512.7
Total Payroll	**$2,511.0**
Local Expenditures	
O&M Construction	$77.1
Service Contracts	$18.9
Educational Services	$5.0
Other Services	$117.1
Other Local Expenditures	$323.5
Retail Spending	$0.6
Local Travel Spending	$44.4
Total Expenditures	**$586.6**
Value of Job Creation	**$813.3**
Total Economic Impact	**$3,910.9**

Source: MacDill Air Force Base, 2019 Economic Impact Statement, FY19.

That makes the base's economic footprint enormously important for both the region and state.

In January 2022, *Enterprise Florida* released a study entitled *Florida Military & Defense Economic Impact Summary* that outlined the various DoD installations throughout the State of Florida and the estimated economic impact they provide to their local communities. According to that report, MacDill AFB was responsible for over $11 billion in economic impact within Hillsborough County, Florida *(Enterprise Florida 2022)*.

Therefore, although the methodologies applied to calculating these different economic impacts, as well as their overall results, may differ, it is well documented that the military's presence—specifically at MacDill AFB—has a significant positive impact on the local community.

3

3 AIRCRAFT OPERATIONS

Aircraft operations are the primary source of noise associated with a military air installation. The level of noise exposure is related to a number of variables, including the aircraft type, engine power setting and afterburner use, altitude flown, direction of the aircraft, flight track, temperature, relative humidity, frequency, and time of operation (day vs. night). This chapter discusses the aircraft based at or transient to MacDill AFB, the types and quantities of operations conducted at the airfields, as well as the runways and flight tracks used to conduct these operations.

3.1 AIRCRAFT TYPES

Aircraft permanently based at MacDill AFB are the most common aircraft conducting flight operations at the installation. It should also be noted that the Air Force is transitioning from the KC-135, which has been a mainstay at MacDill AFB for years, to the KC-46. This AICUZ study presents the aircraft operational data and noise contours of the transition between these two aircraft; therefore, the KC-46 is presented in this section, and the KC-135 has been omitted. Transient aircraft infrequently operating from MacDill AFB include fighter/attack aircraft, such as the F-15, F-16, F/A-18, and A-10, as well as helicopters, such as the UH-60. This is not necessarily a comprehensive list, but it represents the main aircraft operating at MacDill AFB.

3.1.1 PERMANENTLY ASSIGNED AIRCRAFT

KC-135

The KC-135 Stratotanker is a medium-range tanker aircraft capable of cargo and AE support. The KC-135 has been the mainstay of the Air Force tanker fleet for approximately 50 years. It is similar in size and appearance to commercial 707 aircraft but is designed to military specifications. This unique asset enhances the Air Force's capability to accomplish its primary mission of global reach. It also provides aerial refueling support to Air Force, Navy, Marine Corps, and allied nation aircraft. The KC-135 is capable of transporting litter and ambulatory patients using patient support pallets during aeromedical evacuations.

UH-60

The UH-60 Black Hawk is the Army's front-line utility helicopter used for air assault, air cavalry, and aeromedical evacuation units. It is designed to carry 11 combat-loaded air assault troops and is capable of transporting a 105-millimeter howitzer and 30 rounds of ammunition. First deployed in 1978, the Black Hawk's advanced technology makes it easy to maintain in the field. The Black Hawk has performed admirably in a variety of missions, including air assault, air cavalry, and aeromedical evacuations. Modified Black Hawks also operate as command and control, electronic warfare, and special operations platforms. UH-60 helicopters are both permanently assigned aircraft as well as transient aircraft at MacDill AFB.

3.1.2 POTENTIAL FUTURE ASSIGNED AIRCRAFT

KC-46

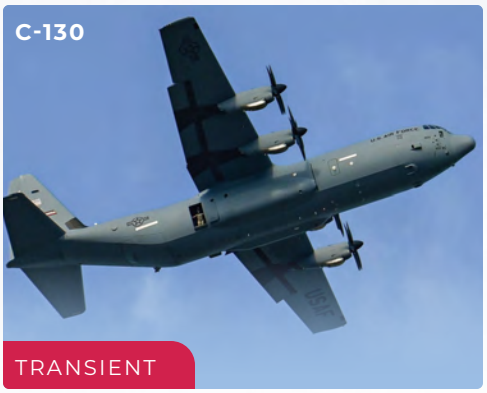
The KC-46 is an aerial refueling aircraft powered by two Pratt & Whitney 4062 engines (thrust reversers removed). Each engine has the capability to provide approximately 62,000 pounds of thrust. With new technology and a maximum fuel capacity expected to be 212,000 pounds, the KC-46 is capable of accomplishing all current aerial refueling missions. The KC-46 will be able to refuel any certified fixed-wing receiver-capable aircraft on any mission, both day and night. The aircraft will be equipped with a modernized refueling boom integrated with a proven fly-by-wire control system and will have the ability to deliver fuel through a centerline hose and drogue system, which adds additional mission capability independent of the boom system. The aircraft will be able to operate at certain night vision goggle (NVG) and/or defensive-system-required airfields with a minimum of 7,000 feet of paved runway available for takeoff or landing. The aircraft will be capable of operating in day-night and adverse weather conditions over vast distances to enable deployment, employment, sustainment, and redeployment of U.S., joint, allied, and coalition forces.


KC-46

FUTURE

3.1.3 TRANSIENT AIRCRAFT

As noted previously, some aircraft may periodically or routinely operate at MacDill AFB, but are not permanently based, these examples are included below.



C-130

The C-130 Hercules primarily performs the tactical portion of the airlift mission. The aircraft is capable of operating from rough, dirt airstrips and is the prime transport aircraft for air-dropping troops and equipment into hostile areas. The C-130 operates throughout the Air Force, serving with Air Mobility Command, Air Force Special Operations Command, Air Combat Command, U.S. Air Forces in Europe, Pacific Air Forces, Air National Guard, and the Air Force Reserve Command, fulfilling a wide range of operational missions in both peace and war situations. Basic and specialized versions of the C-130 airframe perform a diverse number of roles, including airlift support, Antarctic ice resupply, aeromedical missions, weather reconnaissance, aerial spray missions, firefighting duties for the U.S. Forest Service, and natural disaster relief missions.

F-15

The F-15 Eagle is an all-weather, extremely maneuverable tactical fighter designed to permit the Air Force to gain and maintain air supremacy over the battlefield. The F-15's armament includes one internally mounted 20mm six-barrel cannon with 940 rounds of ammunition, four Sidewinder missiles, plus room for between four and eight additional missiles, carried externally. The aircraft is built to achieve air superiority through exceptional maneuverability and acceleration, range, and advanced weapon capabilities and avionics. The weapons and flight control systems are designed so that one person can safely and effectively perform air-to-air combat.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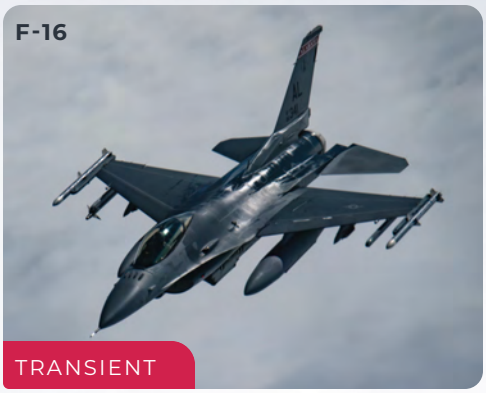
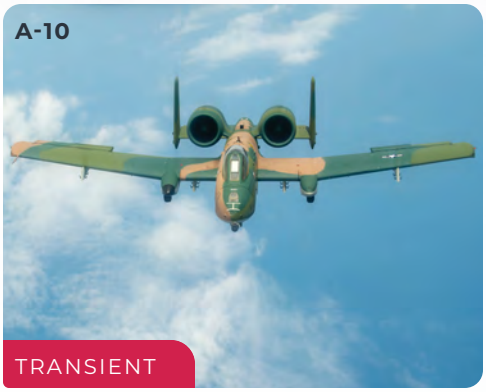


F-16

The F-16 Fighting Falcon is a compact, multi-role fighter aircraft. It is highly maneuverable and has proven itself in air-to-air combat and air-to-surface attack. It provides a relatively low-cost, high-performance weapon system for the U.S. and allied nations. In an air combat role, the F-16's maneuverability and combat radius (distance it can fly to enter air combat, stay, fight, and return) exceed that of all potential threat fighter aircraft. In an air-to-surface role, the F-16 can fly more than 500 miles, deliver its weapons with superior accuracy, defend itself against enemy aircraft, and return to its starting point. The cockpit and its bubble canopy give the pilot unobstructed forward and upward vision, and greatly improved vision over the side and to the rear. The F-16 armament capabilities include one 20mm multi-barrel cannon with 500 rounds and external stations that can carry up to six air-to-air missiles, conventional air-to-air and air-to-surface munitions, and electronic countermeasure pods.



A-10

The A-10 Thunderbolt II is the first Air Force aircraft specially designed for close air support of ground forces. The A-10 is a simple, effective, and survivable twin-engine jet aircraft that can be used against light maritime attack aircraft and all ground targets, including tanks and other armored vehicles. As part of its close air support capability, the A-10 has excellent maneuverability at low airspeeds and altitude, allowing it to remain near battle areas for extended periods of time while maintaining a highly accurate weapons-delivery platform. Using NVG, A-10 pilots can conduct their missions during darkness. The A-10 is also extremely durable and can survive direct hits from armor-piercing and high-explosive projectiles up to 23mm. Armament capabilities include one 30mm seven-barrel Gatling gun, up to 16,000 pounds of mixed ordnance on eight under-wing and three under-fuselage pylon stations, infrared countermeasure flares, electronic countermeasure chaff, jammer pods, illumination flares, and Sidewinder missiles.

F/A-18

The F/A-18 Hornet is an all-weather aircraft, used as both an attack and fighter aircraft, and operated by the Navy and Marine Corps. In its fighter mode, the F/A-18 is used for fighter escort and fleet air defense. In its attack mode, the aircraft is used for force projection, interdiction, and close and deep air support. As the nation's first strike-fighter, the F/A-18 was designed with excellent fighter and self-defense capabilities to increase strike mission survivability.

3.2 MAINTENANCE OPERATIONS

Maintenance is an integral part of any flying operation and requires a dedicated team of professionals to ensure that units can meet their flying requirements. Two key tasks in maintaining aircraft are low- and high-powered engine maintenance runs. MacDill AFB may conduct engine maintenance runs in designated areas on the base to functionally check the operation of engines or other aircraft systems. The areas designated for these maintenance runs include runup pads POW, RP1A, RP2B, and RP2 **(see Figure 2-2).**

Aircraft maintainers may conduct engine maintenance runs at power settings ranging from idle to maximum power. In addition, MacDill AFB strives to conduct aircraft maintenance engine runs during acoustic daytime (i.e., 7:00 a.m. to 10:00 p.m.), and for the purpose of noise modeling it was estimated that 75 percent of such runs are conducted between these hours.

3.3 FLIGHT OPERATIONS

Flight activities, including where aircraft fly, how high they fly, how many times they fly over a given area, and the time of day they operate, must be fully evaluated to understand the relationship between flight operations and land use. This section discusses typical flight operations for aircraft based at or visiting MacDill AFB.

Each time an aircraft crosses over a runway threshold (the beginning or ending of a runway's useable surface) to either take off, practice an approach, or land, it is counted as a single flight operation. For example, a departure counts as a single operation, as does an arrival. As another example, when an aircraft conducts a pattern (a departure followed by an immediate return), it counts as two operations because the aircraft crosses both the approach and departure ends of the runway when conducting the pattern.

The following list defines the typical operations utilized during normal or increased flight operations. Each flight track utilized is designed to maximize flight operations and, when possible, minimize the effects of noise.

- **Takeoff.** A takeoff is the operation during which a pilot positions an aircraft on the runway, and the engine power is set to facilitate movement and eventual flight.
- **Departure.** For the purpose of air traffic sequencing, separation, noise abatement, compliance with avoidance areas, and overall safety of flight, aircraft follow specific ground tracks and altitude restrictions as they depart the airfield's immediate airspace.
- **Straight-In Arrival.** An aircraft performing a straight-in arrival aligns with the runway extended centerline and begins a gradual descent for landing. This type of approach enables an aircraft to maintain a smooth, stable, and steady approach and requires no additional maneuvering.
- **Patterns.** Patterns refer to traffic pattern training during which the pilot performs takeoffs and landings in quick succession by taking off, flying the pattern, and then landing. A closed pattern consists of two portions, a takeoff/departure and an approach/landing; a complete closed pattern is counted as two operations because the aircraft crosses over a runway threshold twice, once on departure and once on arrival. Traffic pattern training is demanding and utilizes all of the basic flying maneuvers a pilot learns—takeoffs, climbs, turns, climbing turns, descents, descending turns, and straight and level landings.

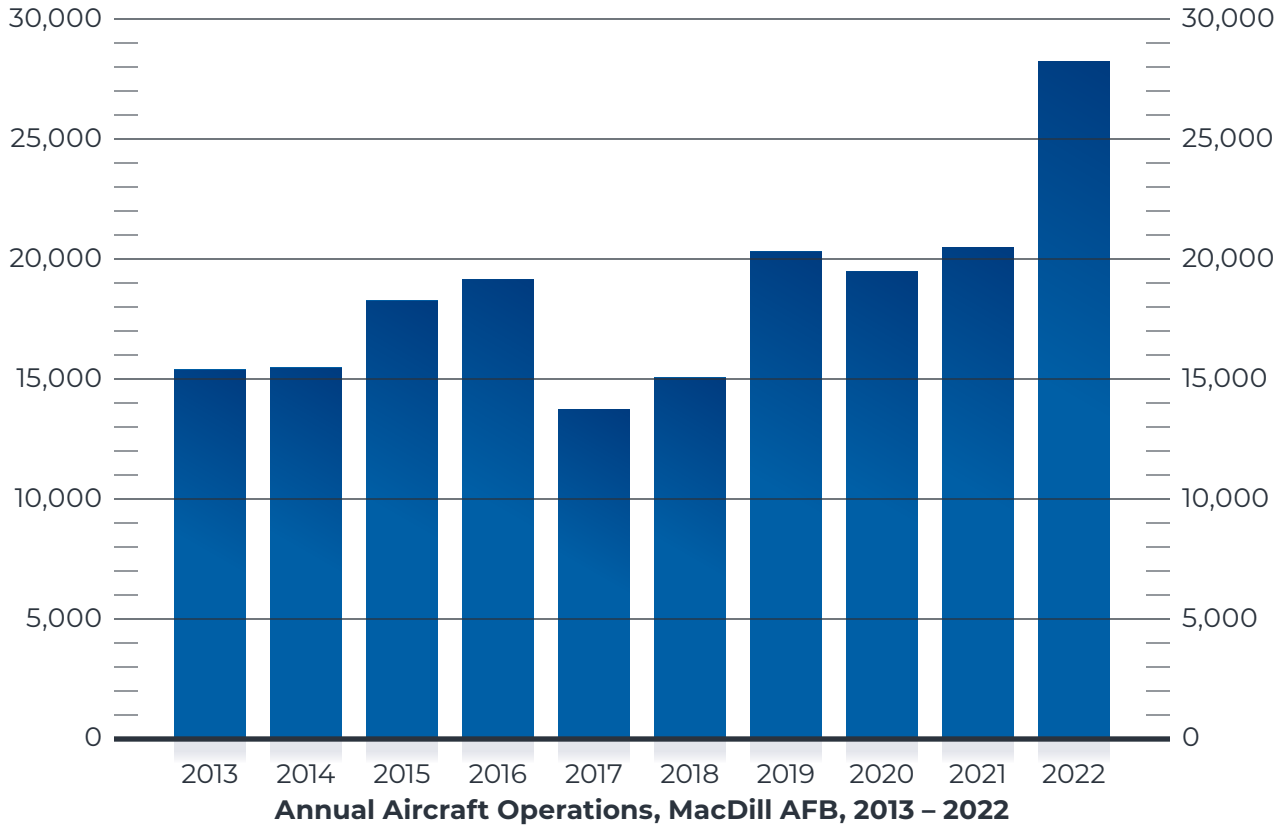
- **Low Approach.** A low approach is an approach to a runway that does not result in a landing but rather a descent toward the runway (usually below 500 feet above ground level) followed by a climb-out away from the airfield. Pilots perform low approaches for a number of reasons, including practicing to avoid potential ground obstructions (e.g., vehicles, debris, stray animals).
- **Touch-and-Go (T&G).** A T&G landing pattern is a training maneuver that involves landing on a runway and taking off again without coming to a full stop. Usually, the pilot then circles the airfield in a defined pattern, known as a circuit, and repeats the maneuver.
- **Radar Approach.** Radar approaches are instrument approaches performed with active assistance from ATC during poor weather conditions. ATC personnel direct the aircraft toward the extended runway centerline. Once established on the centerline, pilots use aircraft instruments to maintain runway alignment and adherence to altitude restrictions, until the pilot is able to acquire visual sight with the runway environment. Pilots often practice this type of approach to maintain their proficiency.

3.4 ANNUAL AIRCRAFT OPERATIONS

Total annual operations account for each departure and arrival, including those conducted as part of a pattern operation. **Figure 3-1** provides the number of aircraft operations flown at MacDill AFB over a 10-year period, including those by based and transient aircraft using the installation.

Data for the 10-year period show aircraft operations at MacDill AFB have ranged between just under 15,000 operations and about 28,000 operations, with no major spikes or dips in the number of operations. The projected aircraft operations are based upon the KC-46 beddown Environmental Impact Statement (EIS) and estimates total installation operations at 25,292 annually **(see Section 4.3.2 for more details)** and includes not only the transition from the KC-135 aircraft to the KC-46 aircraft, but also the other various operating fixed-wing and rotary-wing aircraft at the installation. The projected level of aircraft operations analyzed in the EIS is slightly higher than historical average operations at MacDill AFB, but slightly less operations than flown in 2022. In addition, the number of operations flown annually is dependent on many factors and may ultimately be less than this figure. A wide variety of aircraft are transient to MacDill AFB throughout the year, and they are captured within this analysis as transient aircraft.

The vast majority (94 percent) of the operations at MacDill AFB take place during acoustical daytime (defined as taking place from 7:00 a.m. to 10:00 p.m.), with 6 percent occurring during acoustical nighttime (defined as taking place from 10:00 p.m. to 7:00 a.m.). The graphic below provides a further break down by operation type, including arrivals, departures and patterns.



Source: MacDill AFB ATC 2022 and AFCEC 2022.

Figure 3-1 Summary of Flight Operations for Fiscal Years 2013-2022

3.5 RUNWAY UTILIZATION AND FLIGHT TRACKS

3.5.1 RUNWAY UTILIZATION

A variety of factors determine the frequency with which aircraft utilize a runway, including but not limited to:

- Airfield environment (layout, lights, runway length);
- Direction of prevailing winds;
- Location of natural terrain features (rivers, lakes, mountains, and other features);
- Wildlife activity;
- Number of aircraft in the pattern; and/or
- Preference of a runway for the purpose of safety and noise abatement.

ATC personnel establish the runway in use. Aviation planners adjust the pattern procedures accordingly to maximize air traffic flow efficiency. **Table 3-1** lists how frequently each runway at MacDill AFB is used.

TABLE 3-1

Current Runway Usage and Flight Routing

Runway Direction	Percent
Runway 05 (arriving from the direction of St. Petersburg and/or departing toward Tampa)	**50%**
Runway 23 (arriving from the direction of Tampa and/or departing toward St. Petersburg)	**50%**

Source: KC-46 Beddown EIS 2023

3.5.2 FLIGHT TRACKS

Each runway has designated flight tracks that provide for the safety, consistency, and control of an airfield. Flight tracks depict where aircraft fly in relation to an airfield. They are used for departures, arrivals, and pattern procedures, and they are designated for each runway to facilitate operational safety, noise abatement, aircrew consistency, and the efficient flow of air traffic within the ATC tower's controlled airspace. Aircraft flight tracks are not set "highways in the sky." While flight tracks are depicted as lines on a map, they are actually wider "bands." Aircraft de-confliction, configuration, pilot technique, takeoff weight, and wind all affect the actual path taken on any given flight.

In addition, airspace in the area is busy, but well managed, as there are several major and smaller airfields within the proximity of MacDill AFB. These include Tampa International Airport (to the north), Peter O. Knight Airport (to the northeast), and the City of St. Petersburg's Albert Whitted Airport (to the southwest).

Figures 3-2 through 3-4 present commonly used departure, arrival, and pattern flight tracks for MacDill AFB.

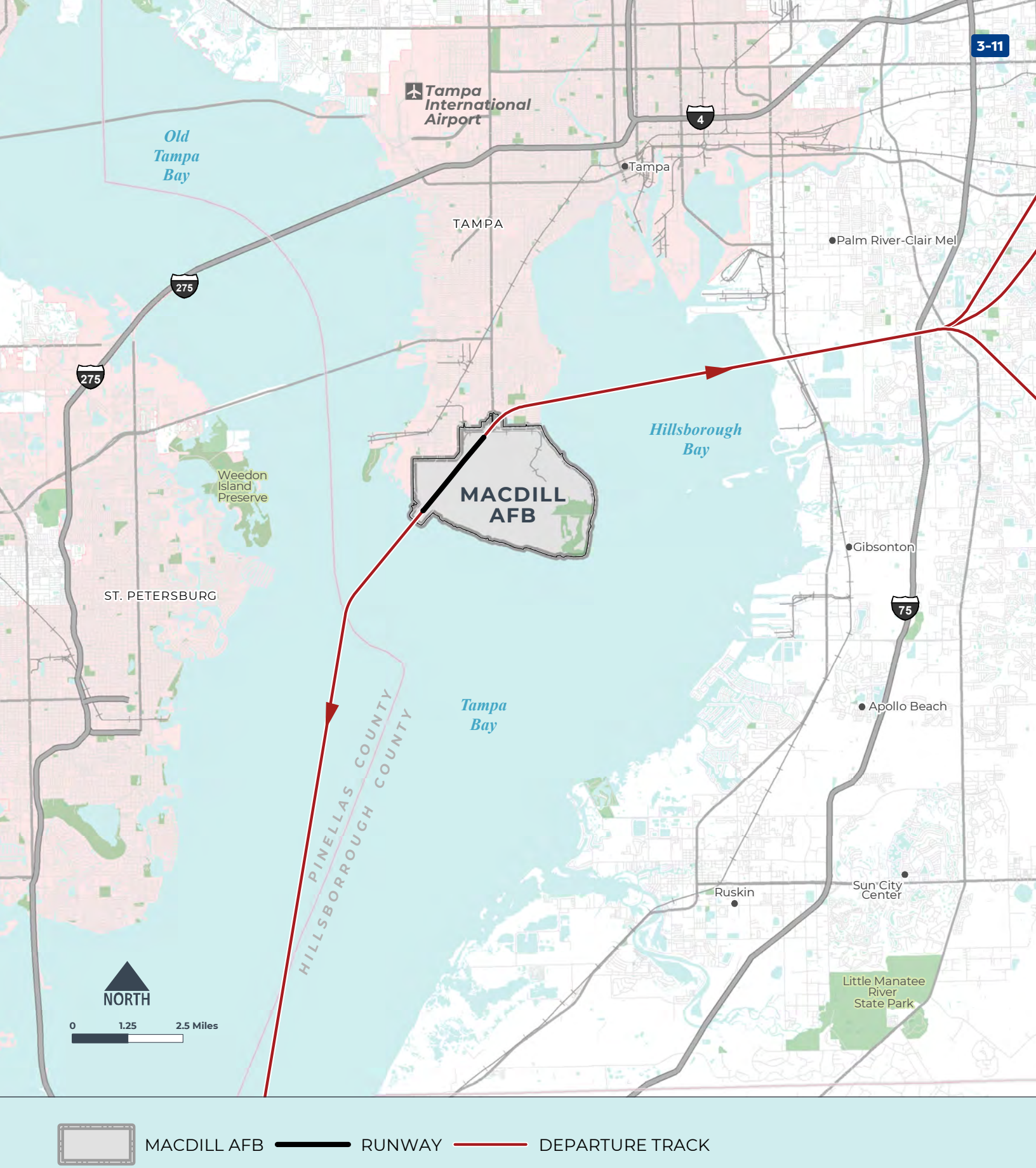


Figure 3-2 MacDill AFB Departure Flight Tracks

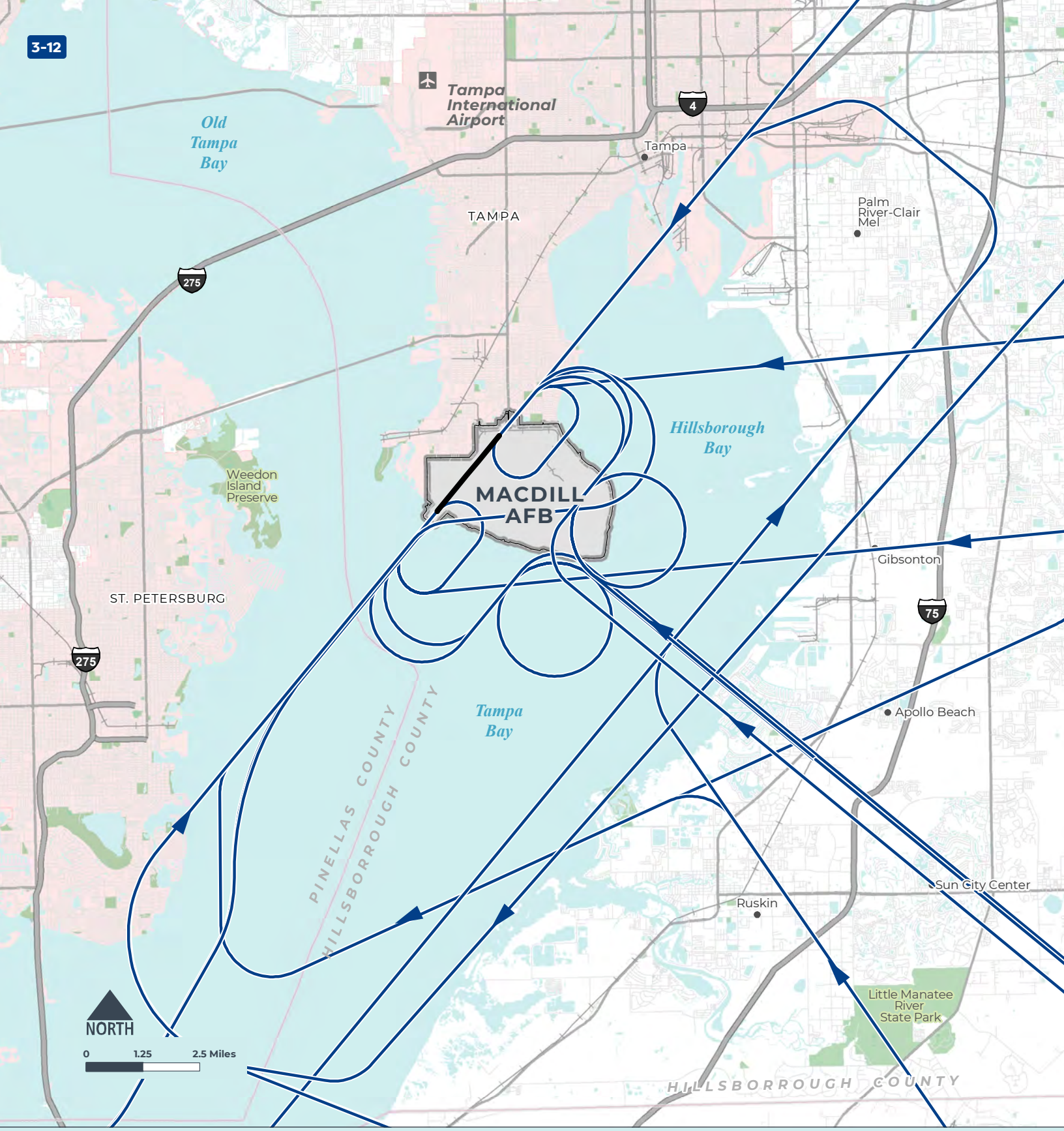


Figure 3-3 MacDill AFB Arrival Flight Tracks

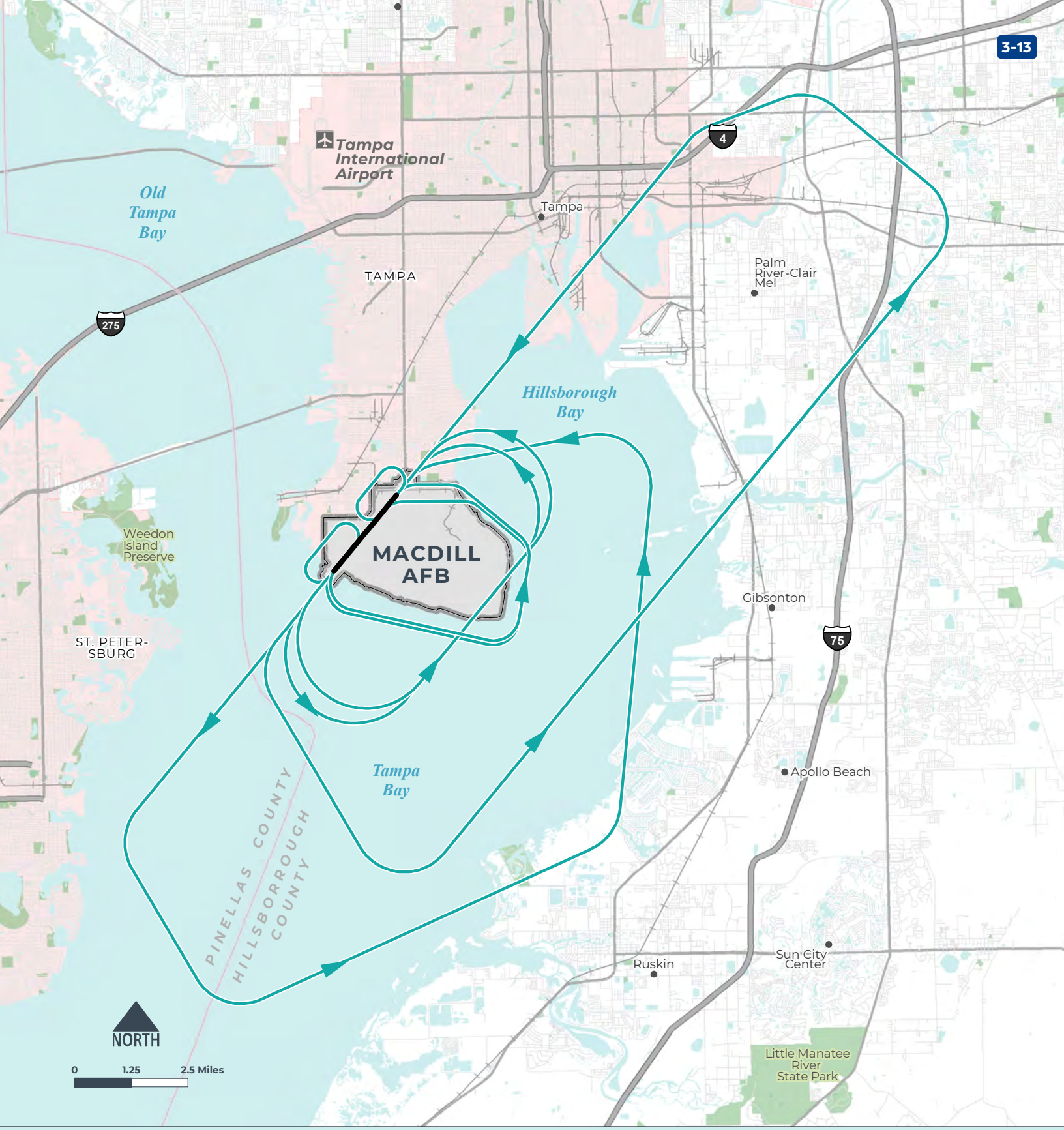


Figure 3-4 MacDill AFB Pattern Flight Tracks

4

4 MILITARY OPERATIONAL NOISE

How an installation manages operational noise can play a key role in shaping that installation's relationship with neighboring communities. There may be several noise sources or noise producers at a military installation (e.g., vehicular traffic, explosive ordnance disposal activities, small arms training, etc.); however, at an air installation such as MacDill AFB, the primary source of noise is from aircraft operations. Ideally, aircraft noise and its management should be key factors in local land use planning. Because noise from aircraft may affect areas around an installation, the Air Force has defined noise zones using the guidance provided in the AFH (AFH 32-7084) The *AICUZ Program Manager's Guide*.

Terrain features, weather phenomena, man-made structures, and daily life activity contribute to noise exposure.

4.1 WHAT IS SOUND/NOISE?

Sound consists of vibrations in the air. A multitude of sources can generate these vibrations, including roadway traffic, barking dogs, radios, or aircraft operations. These vibrations are transmitted through compression waves. Just as a pebble dropped into a pond generates ripples, the compression waves formed of air molecules pressed together radiate out, decreasing with distance. If these vibrations reach a listener's eardrum at a certain rate and intensity, he or she perceives them as sound. When the sound is unwanted, the listener refers to it as noise. Generally, sound becomes noise to a listener when it disturbs and interferes with normal activities. Sound has three components: intensity, frequency, and duration.

Sound becomes noise when it interferes with normal activities.

- **Intensity,** or loudness, relates to sound pressure change. As the vibrations oscillate back and forth, they create a change in pressure on the eardrum. The greater the sound pressure change, the louder a sound seems.
- **Frequency** determines how a person perceives the pitch of the sound. People hear low-frequency sounds as rumbles or roars, while sirens or screeches typify high-frequency sounds. Sound frequency is measured in cycles per second, or hertz (Hz). While human hearing capability ranges from 20 to 20,000 Hz, people hear best in the range of 1,000 to 4,000 Hz. For environmental noise, the Air Force uses A-weighting, which focuses on this frequency range, to best represent human hearing. While one may refer to A-weighted decibels as "dBA," if it is the only weighting being discussed, the "A" is generally dropped.
- **Duration** is the length of time one can detect the sound.

4.2 HOW IS SOUND PERCEIVED?

The loudest sounds that the human ear can comfortably hear are a billion times higher in intensity than those sounds that one can barely hear. Because such large numbers become awkward to use, noise is measured in decibels (dB), which uses a logarithmic scale.

Figure 4-1 is a chart of A-weighted sound levels from common sources. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB can cause discomfort inside the ear, while sound levels above 130 dB are felt as pain.

Table 4-1 shows the subjective responses with change in (single-event) sound level. While noise energy doubles or halves with every 3 dB change, people do not perceive all this noise energy. It takes a 10 dB increase or decrease for human ears to perceive a doubling or halving of loudness. Please note: Because these example metrics are for a single event, they cannot be compared to the day-night average sound level (DNL), which is a cumulative metric.

Figure 4-1 Typical A-weighted Levels of Common Sounds

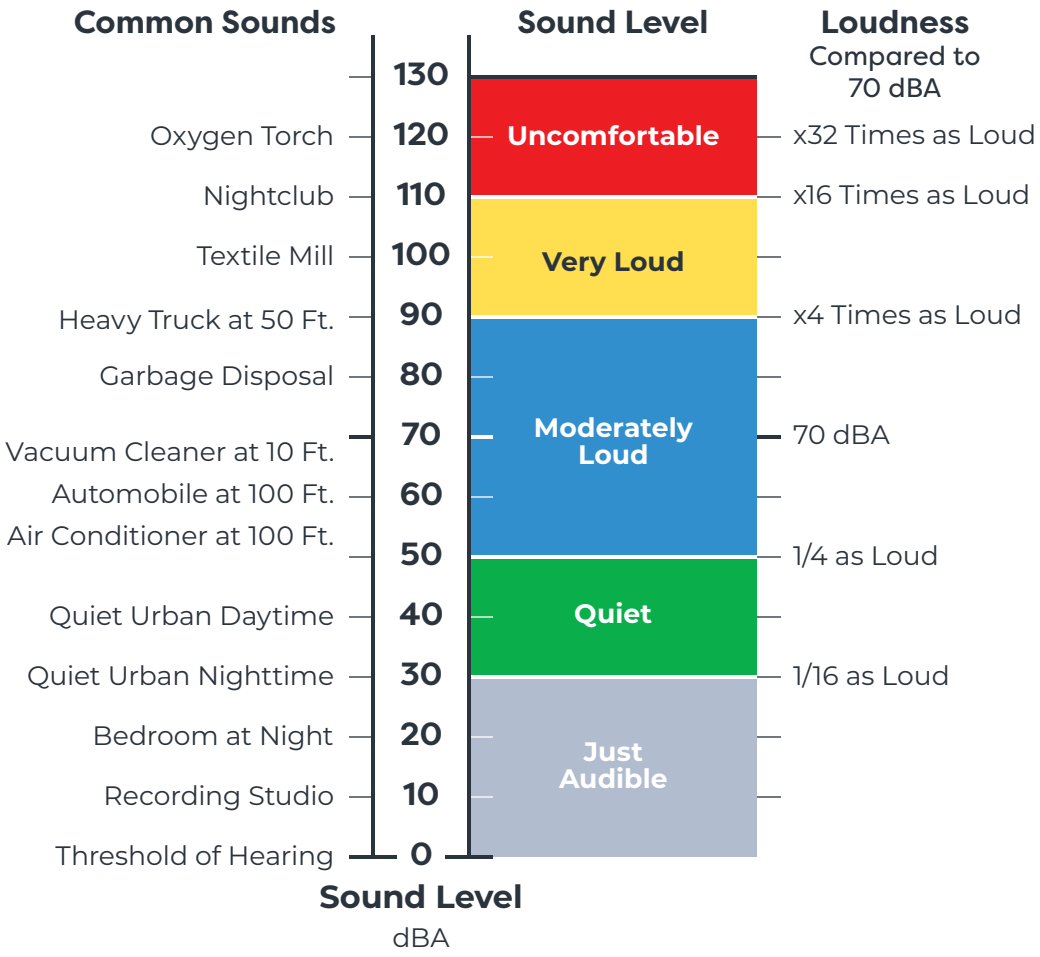


TABLE 4-1

Subjective Response to Changes in Sound Level

Change in Sound Level	Change in Loudness
10 dB	Twice or half as Loud
5 dB	Quite Noticeable
3 dB	Barely Perceptible
1 dB	No Noticeable Change

4.3 THE DAY-NIGHT AVERAGE SOUND LEVEL

When people hear an aircraft fly overhead, the question they may ask is, "How loud was that?" While people may often find themselves concerned over the loudness of a sound, there are other dimensions to the sound event that draw their interest. For instance, does one overflight draw the same interest as two separate overflights—or 20? Does the 30-second run-up of engines prior to takeoff draw the same interest as a 30-minute maintenance run? Additionally, is an overflight more noticeable at 2:00 p.m. or at 2:00 a.m., when the ambient noise is low and most people are sleeping?

The length and number of events—the total noise energy—combined with the time of day that a noise event takes place play key roles in people's perception of noise. To reflect these concerns, the Air Force uses a metric called the "day-night average sound level," abbreviated as DNL. The U.S. Environmental Protection Agency (EPA) created DNL for use throughout the U.S.

DNL, when used as a metric for aircraft noise, is A-weighted, or ADNL; this A-weighting represents the accumulation of noise energy from all aircraft noise events in a 24-hour period. This weighting factor removes lower frequencies to provide the sound level humans hear. Oftentimes, when discussing ADNL, we drop the "A." Additionally, for all operations conducted between 10:00 p.m. and 7:00 a.m., DNL adds a 10 dB adjustment to each event to account for the intrusiveness of sound generated during nighttime operations. As is implied in its name, DNL represents the noise energy present in a daily period. However, because aircraft operations at military airfields fluctuate from day to day, the Air Force typically bases DNL on a year's worth of operations and represents the annual average daily aircraft events.

DNL is not a sound level heard at any given time but represents long-term sound exposure. Scientific studies have found a correlation between the percentages of groups of people highly annoyed by sounds and the level of their cumulative average sound exposure measured in DNL.

The noise environment at MacDill AFB includes noise sources that can be classified as continuous. Continuous noise refers to noise events that have a gradual onset, such as an aircraft taking off, and not necessarily noise that is occurring at a constant level at all times.

4.3.1 PLANNING NOISE CONTOURS

The DoD develops noise contours to assess the compatibility of aircraft operations with surrounding land uses. Noise contours connect points of equal sound value, just as contours on topographic maps connect points of equal elevation. The Air Force utilizes NOISEMAP, the DoD standard model for assessing the operational noise footprint from military aircraft operations at air installations. Noise contours, when overlaid on local land use maps, can help to identify areas of incompatible land use and assist communities in planning for future development around an air installation.

An AICUZ study typically provides future-year planning noise contours. Long-range planning by local land use authorities involves strategies that influence present and future uses of land. Due to the long-range nature of this planning, the Air Force provides planning contours—noise contours based on reasonable projections of future missions and operations. AICUZ studies use planning contours to provide a description of the long-term operational noise footprint for projected aircraft operations that is more consistent with the planning horizon used by state, tribal, regional, and local planning bodies.

For this AICUZ study, MacDill AFB has chosen to utilize the noise contours generated as part of the KC-46 MOB 6 Beddown National Environmental Policy Act EIS process as their AICUZ planning noise contours. The use of the KC-46 EIS noise contours, as the planning contour in this AICUZ Study is not pre-decisional, but it provides MacDill AFB with up-to-date, realistic noise contours based upon current and reasonably foreseeable aircraft operations. These noise contours can be used for long-term land use planning purposes and to encourage compatible development around the installation.

Utilizing a planning noise contour to provide long-range operational flexibility to the installation does not constitute a commitment to future operational changes. In addition, inclusion of planning contours in the AICUZ study does not eliminate the need to conduct appropriate environmental analysis at a future date.

4.3.2 MACDILL AFB NOISE CONTOURS

The 2023 AICUZ Study for MacDill AFB noise contours are presented on **Figure 4-2.** As previously noted, this AICUZ study is presenting as its planning contours those noise contours modeled as part of the EIS for the beddown of the KC-46 at MacDill AFB.

The 65 dB DNL noise contour extends beyond the northeastern boundary of the installation less than one-half mile. A portion of the 65 dB DNL noise contour as well as the 70 dB DNL noise contour extend to an off-installation area to the northwest of the airfield approximately 0.2 miles. Both of these areas within the 2023 AICUZ Study for MacDill AFB noise contours are within the City of Tampa limits. In addition, although the noise contours extend to the southwest of the installation, that area is all over open water.

Table 4-2 provides the total number of modeled aircraft operations at MacDill AFB cited as part of the KC-46 beddown EIS. The total operations modeled in this EIS analysis is 25,292, with the majority of flights being projected to be flown by the KC-46 aircraft.

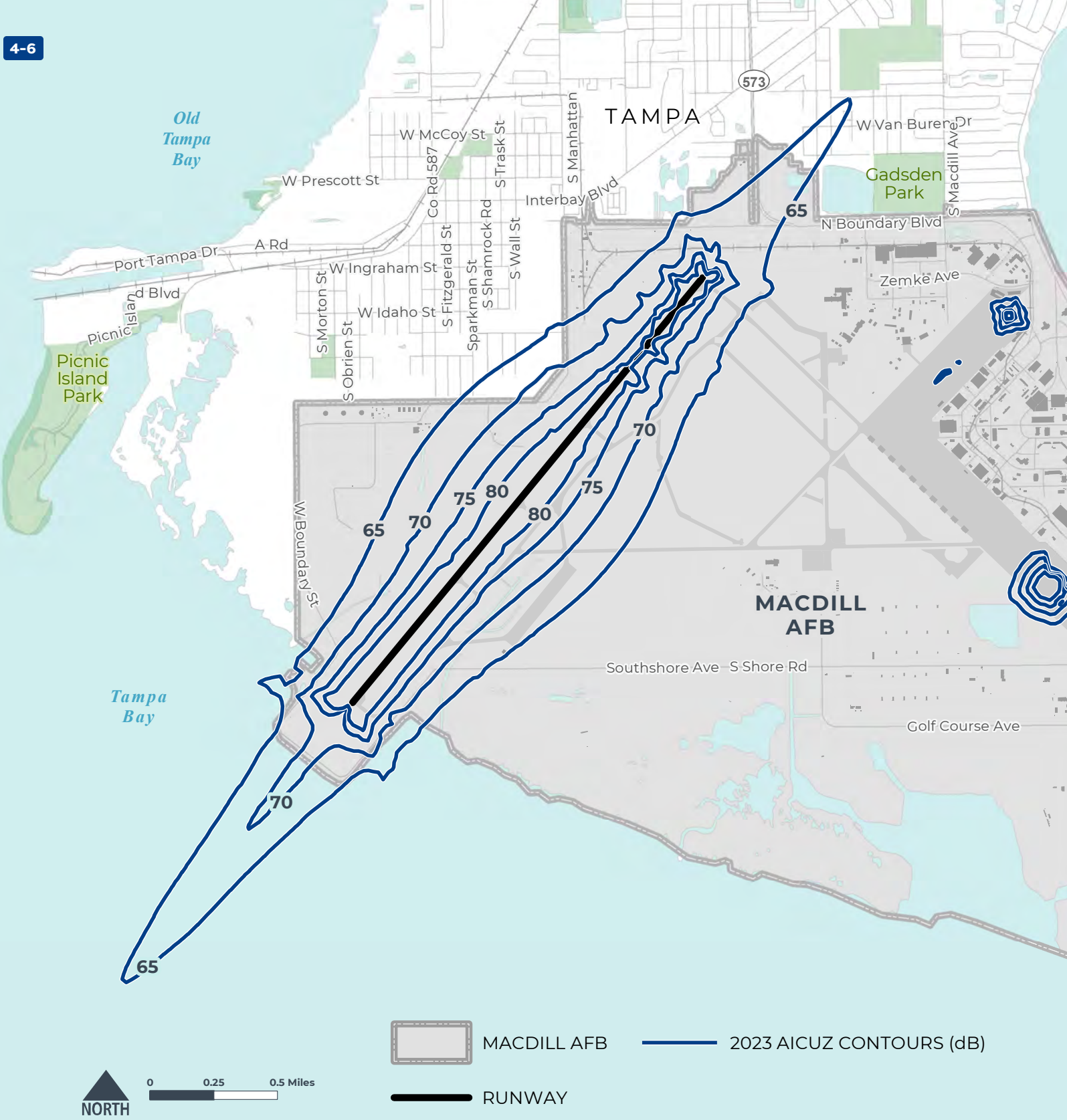


Figure 4-2 Operational 2023 AICUZ Noise Footprint at MacDill AFB

TABLE 4-2

Projected Annual Aircraft Flight Operations

	Arrivals	Departures	Pattern Operations[1]	Totals
Based Aircraft				
KC-46	1,307	1,307	10,608	**13,222**
UH-60	469	469	374	**1,312**
Transient Aircraft				
A-10	135	135	598	**868**
C-12	84	84	0	**168**
C-130	296	296	2,887	**3,479**
C-17	70	70	0	**140**
C-21	140	140	0	**280**
F-15	43	43	1,197	**1,283**
F-16	172	172	598	**942**
F/A-18	85	85	855	**1,025**
F-35	53	53	0	**106**
KC-10	6	6	0	**12**
KC-135	143	143	0	**286**
KC-46	83	83	0	**166**
UH-60	160	160	1,683	**2,003**
Based Aircraft Operations	**1,776**	**1,776**	**10,982**	**14,534**
Transient Aircraft Operations	**1,470**	**1,470**	**7,818**	**10,758**
Combined Grand Total	**3,246**	**3,246**	**18,800**	**25,292**

Source: KC-46 Beddown EIS 2023

Note: [1]Each "pattern operation" consists of two total operations: one arrival and one departure.

Table 4-3 presents the off-installation land acreage (i.e., excludes water) and estimated population within the planning contours. The Air Force generates population estimates based upon 2016-2020 American Community Survey 5-year Estimates from the U.S. Census Bureau. This is done using data at the census-block level using a geometric proportion method to determine the estimated population within each noise contour. This method assigns population based on the portion of a census block that falls within a given noise contour and assumes the population across the census block is evenly distributed. It is important to note, however, that sound associated with aircraft operations extends beyond the plotted 65 dB DNL noise contours.

The operational noise exposes areas and residents to sound levels of 65 dB DNL and greater over an area of approximately 59 acres and containing 102 people, with essentially 100 percent of them located within the 65 to 69 dB DNL noise contour. There are approximately 5.26 acres within the greater than 70 dB DNL noise contour; however, there are no structures in this area and therefore, no population associated within this area. No other high-noise contours leave the installation property.

TABLE 4-3

Off-Installation Land Area and Estimated Population within the Noise Contours at MacDill AFB

Noise Zone (dB DNL)	Acres	Estimated Population
65-69	54.02	102
70-74	5.26	0
75+	0	0
Total (65+)	**59.28**	**102**

Source: U.S. Census Bureau – 2016-2020 American Community Survey 5-year Estimates and aerial photography interpretation.

Note: The acreage excludes 166.54 acres where the noise contours were off-installation but over water.

Figure 4-3 also shows the MacDill AFB planning noise contours with color gradient shading. The shading depicts how MacDill AFB noise propagates between the noise contour lines.

Figure 4-4 shows a comparison between the 2023 AICUZ Study for MacDill AFB noise contours and the 2008 AICUZ Study for MacDill AFB noise contours. As this comparison shows, the 2023 noise contours cover less off-base land area than those presented in the 2008 AICUZ Study for MacDill AFB. There are several reasons that explain this, but perhaps the most significant reason for the reduction of the area covered by the noise contour is the noise modeling methodology used. The 2008 AICUZ study noise contours are presented using the "average busy day" (ABD) approach, which averages the operations over the number of busy days when the airfield is operating to generate a noise contour. This by its nature would result in a larger noise contour using ABD methodology. For many years, the Air Force approximated the ABD concept, which acknowledged that flying at some installations seldom occurred on weekends and that annual operations therefore were divided by the number of operational days (e.g., five flying days multiplied by 52 weeks equals 260 operational days). Although current policy across the DoD for calculating DNL at airfields is to divide annual operations by 365 days—the "average annual day" (AAD) approach—the former practice was used in older studies and should be acknowledged when comparing older studies to newly modeled noise contours.

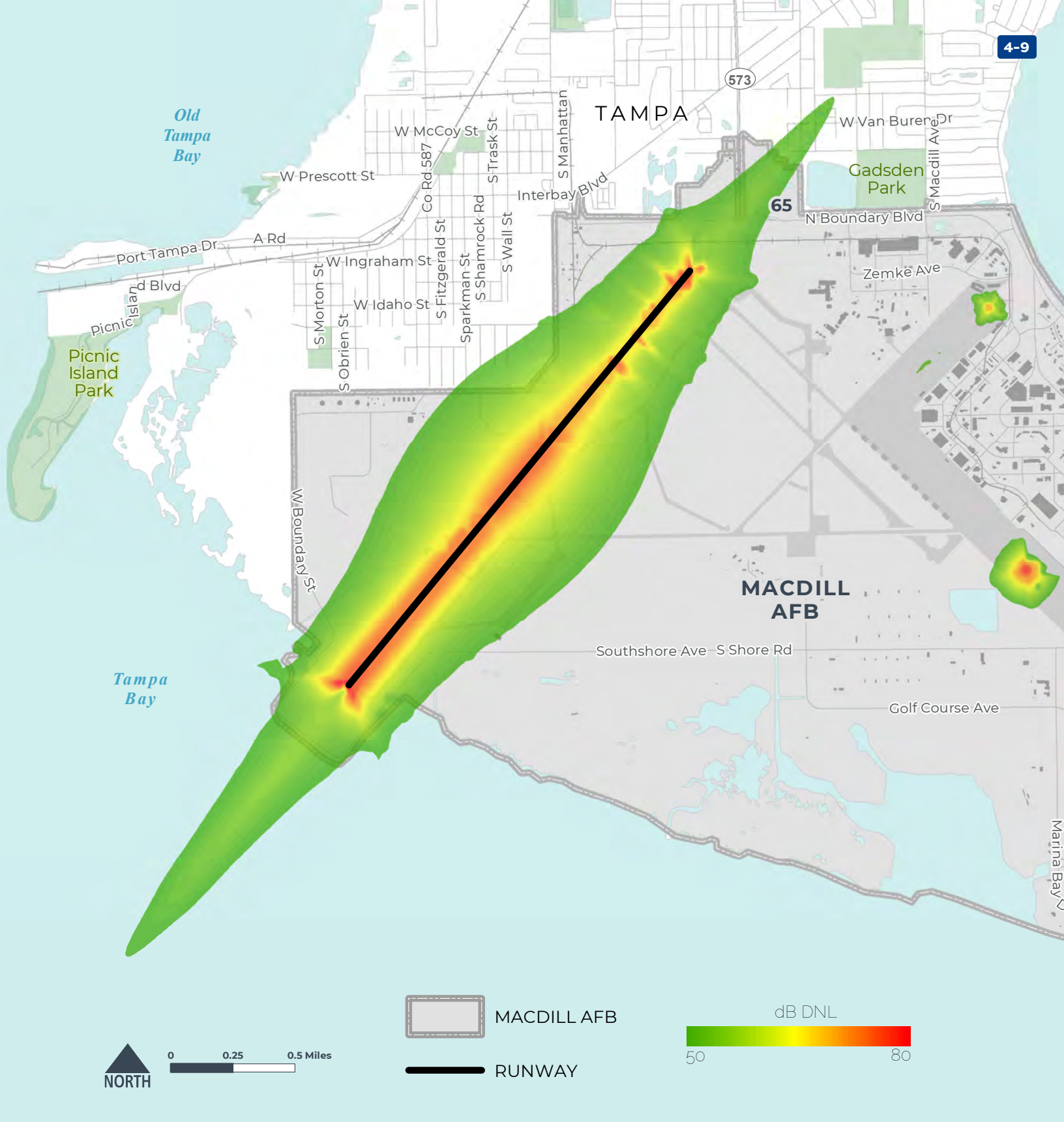


Figure 4-3 2023 AICUZ Noise Gradient at MacDill AFB

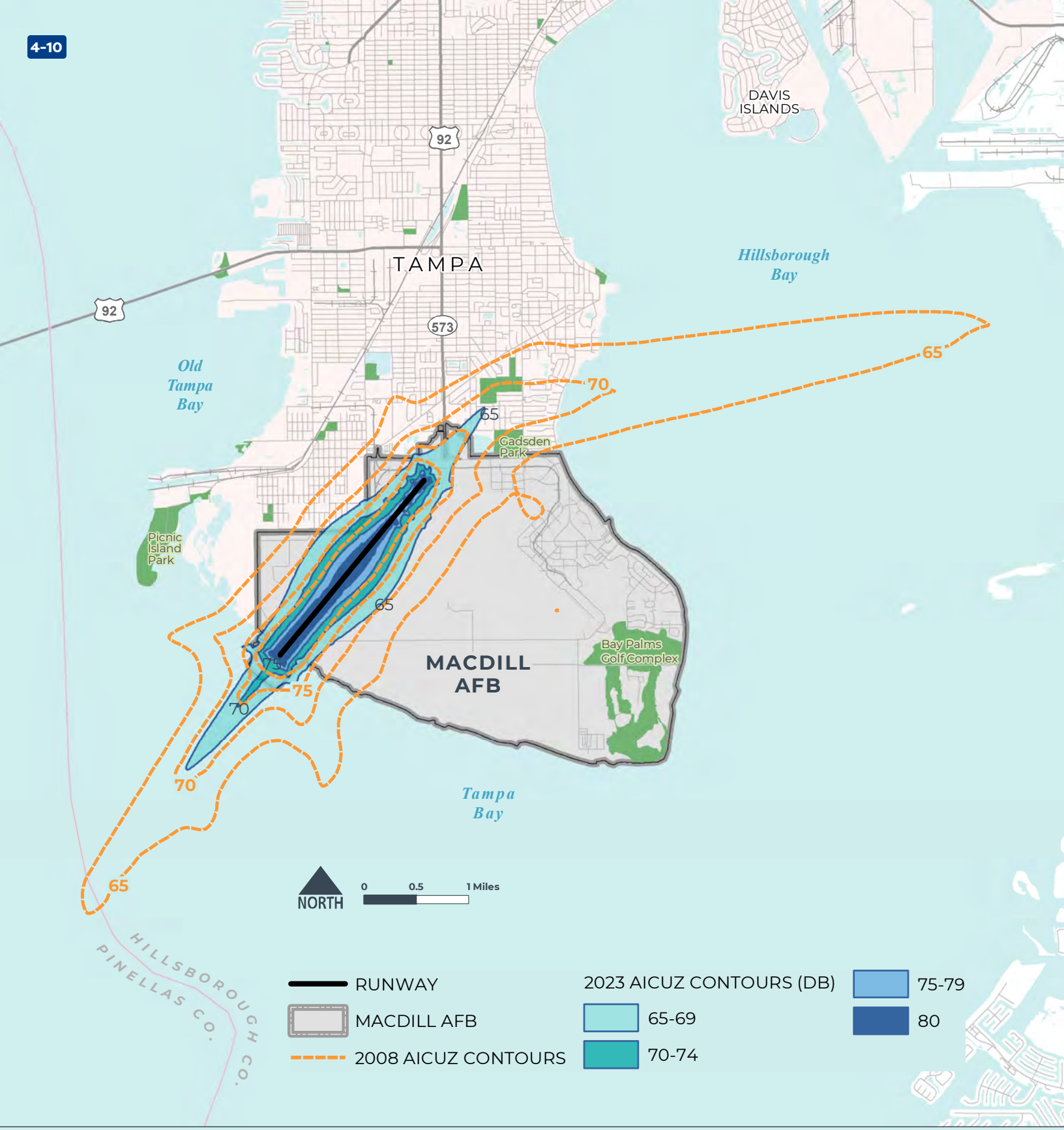


Figure 4-4 Noise Contour Comparison (2008 to 2023) at MacDill AFB

Since land use compatibility as discussed in this AICUZ study is better correlated with *AAD methodology,* as is outlined in *DODI 4165.57,* that is what is utilized in the development of the current noise contours presented in this AICUZ. This approach takes the total operations for the installation annually across 365 days and calculates the average daily operations for input into the noise model. This takes into account both busy days as well as days where there is not much aircraft activity.

4.4 NOISE ABATEMENT

The Air Force recognizes that sound from military operations may cause concern for people living near military installations.

For this reason, the Air Force has established a noise program aimed at reducing and controlling the emission of noise and vibrations associated with the use of military aircraft, weapon systems, and munitions while maintaining operational requirements. The result is the implementation of various strategies, techniques, and procedures, documented in the *MAFB Instruction 13-201 – Air Operations* (6 September 2018, Airfield Operations Procedures and Programs), that are aimed at protecting the installation's neighbors and structures from the harmful effects of noise and vibrations.

To minimize the impact of aircraft noise on the local community, the most stringent noise abatement procedures, compatible with safety, will be employed.

- **No multiple Instrument Flight Rules/ Visual Flight Rules approach** for transient aircraft between the hours of 10:00 p.m. and 6:00 a.m.
- **Afterburner-equipped aircraft will terminate use of afterburners** as soon as practical after departure.
- **Intersection/formation departures will not be permitted** if aircraft cannot reach 1,000 feet above MSL prior to the airfield boundary.
- **Overflight of noise-sensitive areas will be avoided in visual meteorological conditions** so long as safety is not compromised. These areas include the St. Petersburg land mass restriction and Apollo Beach as defined in the DoD approach plates for MacDill AFB.

Installation leadership periodically reviews flight operations and their potential impact on surrounding communities. This review process facilitates the planning, designation, and establishment of flight tracks over sparsely populated areas and/or waterways as often as practicable to balance operational safety with reduced noise exposure levels in surrounding communities.

4.5 NOISE COMPLAINTS

At times, military operations may generate noise complaints. The Air Force evaluates all noise complaints to ensure future operations, when possible, do not generate unacceptable noise. Concerned citizens are encouraged to contact **MacDill AFB PA at: communityrelations@us.af.mil or they can call MacDill AFB PA at 813-828-2217, Monday through Friday from 8:00 a.m. to 4:00 p.m.** Citizens should provide the following information to the best of their ability:

A. Citizen's name

B. Mailing address

C. Phone number

D. Location of concern (towns, major streets, or landmarks)

E. Specific concern

F. Date and time of occurrence

G. Description of aircraft (type, color, or markings)

H. Direction of aircraft

I. Weather at location

J. Estimated altitude

k. Whether a reply is requested

Once submitted, PA will contact the appropriate MacDill AFB authorities to confirm the aircraft belonged to MacDill AFB or another agency. Once confirmed, if a reply has been requested, PA will try to confirm the origin of the aircraft and let the citizen know the status of similar future flights.

Several times throughout the year, and especially during the winter months, MacDill AFB becomes the temporary home to several flying units. Typically, these units are escaping severe winter weather so they can continue their training. In these cases, PA will make public releases in advance, notifying the public of the increased air activity.

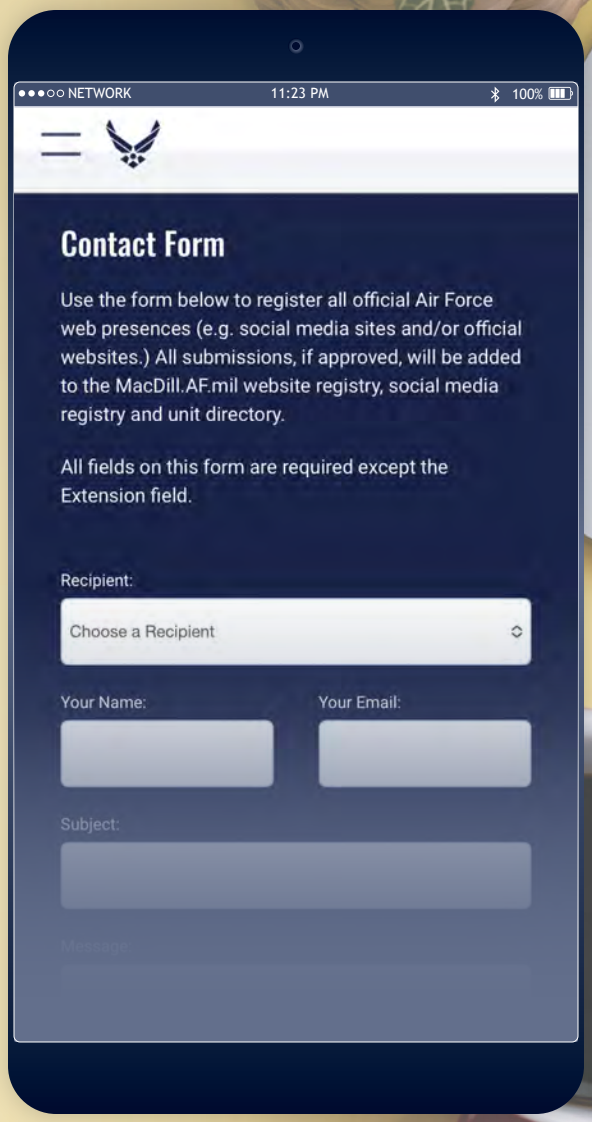
MacDill AFB also posts information on the installation website, including alerts about upcoming aircraft operations that are able to be shared publicly:

WWW.MACDILL.AF.MIL

/MACDILLAIRFORCEBASE

/MACDILL_AFB

/MACDILLAFB


●●●○○ NETWORK
11:23 PM
100%
Contact Form
Use the form below to register all official Air Force web presences (e.g. social media sites and/or official websites.) All submissions, if approved, will be added to the MacDill.AF.mil website registry, social media registry and unit directory.
All fields on this form are required except the Extension field.
Recipient:
Choose a Recipient
Your Name:
Your Email:
Subject:
Message:

5

5 COMMUNITY AND AIRCRAFT SAFETY

Community and aircraft safety is paramount to the Air Force and is a shared responsibility between the Air Force and the surrounding communities, with each playing a vital role in its success. Cooperation between the Air Force and the community results in strategic and effective land use planning and development. As such, the Air Force has established a flight safety program and has designated areas of accident potential around its air installations to assist in preserving the health, safety, and welfare of residents living near its airfield. This AICUZ study provides the information needed, in part, to reach this shared safety goal.

Identifying safety issues assists the community in developing land uses compatible with airfield operations. As part of the AICUZ Program, the Air Force defines areas of accident potential, imaginary surfaces, and hazards to aircraft flight.

5.1 CLEAR ZONES AND ACCIDENT POTENTIAL ZONES

In the 1970s and 1980s, the military conducted studies of historical accident and operations data throughout the military. The studies showed that most aircraft mishaps occur on or near the runway, diminishing in likelihood with distance from the runway. Based on these studies, the DoD identified CZs and APZs as areas where an aircraft accident is most likely to occur if an accident were to take place; however, it should be noted that CZs and APZs are not predictors of accidents. The studies identified three areas that, because of accident potential, planners should consider for density and land use restrictions: the CZ, the Accident Potential Zone I (APZ I), and the Accident Potential Zone II (APZ II).

The CZs and APZs for Class B runways are described in the list below and are depicted on **Figure 5-1:**

- **Clear Zone.** At the end of all active DoD runways is an area known as the "Clear Zone." The CZ for Class B runways is 3,000 feet long by 3,000 feet wide and is centered on the end of the runway. All active runways have CZs and should remain undeveloped.
- **APZ I.** Beyond the CZ is APZ I, which is 3,000 feet wide and 5,000 feet in length along the extended runway centerline.
- **APZ II.** Beyond APZ I is APZ II, which is a rectangular area 3,000 feet wide by 7,000 feet in length along the extended runway centerline.

Within the CZ, the only land uses compatible with military aircraft operations and defense missions are undeveloped lands and certain right-of-way and agricultural uses. For this reason, it is the Air Force's policy, where possible, to acquire real property interests in land within the CZ to ensure incompatible development does not occur. For APZ I and APZ II, a variety of land uses are compatible; however, higher density uses (e.g., schools, apartments, churches) and more intense uses (e.g., office buildings, strip malls) should be limited and, if possible, prevented because of the greater safety risk in these areas. **Chapter 6** discusses land use and recommendations for promoting compatible growth and addressing incompatibility issues within APZs for each runway.

Figure 5-1 Runway Clear Zones and Accident Potential Zones for Class B Runways

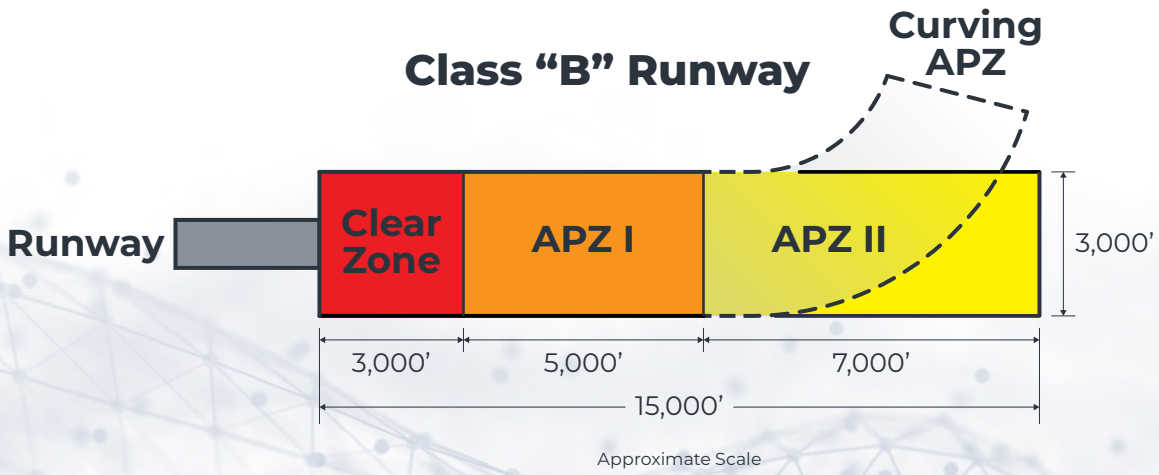


Figure 5-2 depicts the CZs and APZs for Runway 05/23 at MacDill AFB. The CZs and APZs are straight along the runway heading, along with an APZ I and APZ II turning slightly to the east when departing Runway 05. This follows some predominant arrival and departure flight tracks that were implemented to intentionally direct aircraft over water and away from more populated areas. There has been no change to the CZ or APZs from those presented in the 2008 AICUZ Study for MacDill AFB.

At MacDill AFB, the majority of lands within the CZs are within the installation boundary, while large portions of APZ I and APZ II extend off the installation property to the northeast over portions of the City of Tampa. These areas consist of a high proportion of residential land uses, including single-family homes, multi-family homes and commercial and public entities, including a marina/yacht club, a school, and parks. Existing land uses with the CZs and APZs will be discussed further in **Section 6.**

Table 5-1 presents the off-installation land acreage and estimated population within the CZs and APZs, excluding areas over water. As indicted earlier, there is a relatively small portion of the CZ that extends off installation, and there are no homes or population associated with this area. Approximately 478.44 acres of APZ I is located outside the installation fence line, and an estimated population of 3,129 individuals live in these areas. A slightly smaller portion of APZ II areas is off installation property (approximately 389.07 acres), but due to the higher population density in these areas, it is estimated that 3,599 individuals live in this area. Chapter 6 discusses land use and recommendations for addressing incompatibility issues within CZs and APZs for an airfield.

TABLE 5-1

Off-Installation Land Area and Estimated Population within the Clear Zones and Accident Potential Zones

Fixed Wing Zone	Acres	Population
CZ	36.11	0
APZ I	478.44	3,129
APZ II	389.07	3,599
Total	**903.62**	**6,728**

Source: U.S. Census Bureau – 2016-2020 American Community Survey 5-year Estimates.

Note: The acreage excludes 1,586.36 acres where the accident potential zones were off installation but over water.

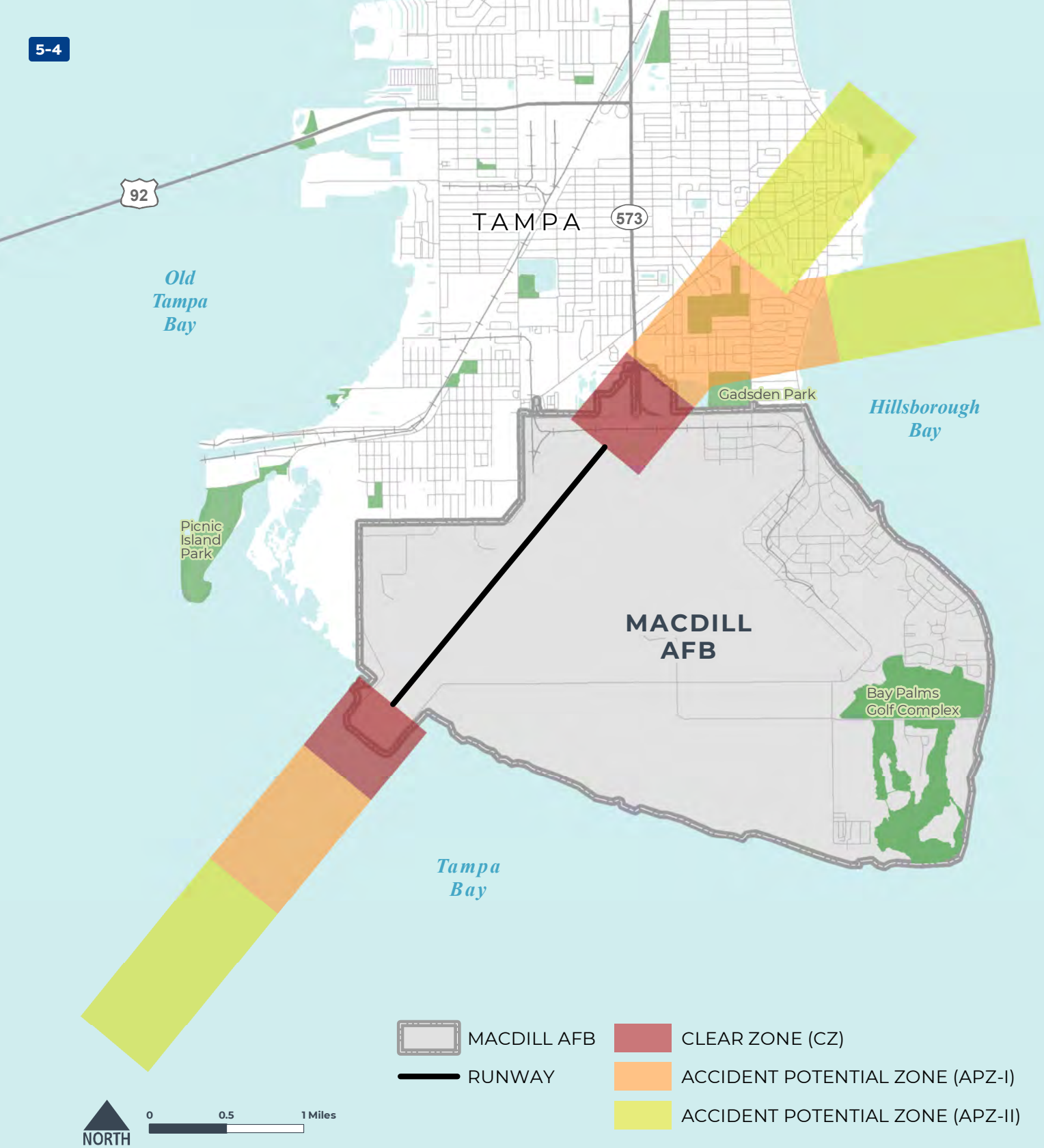


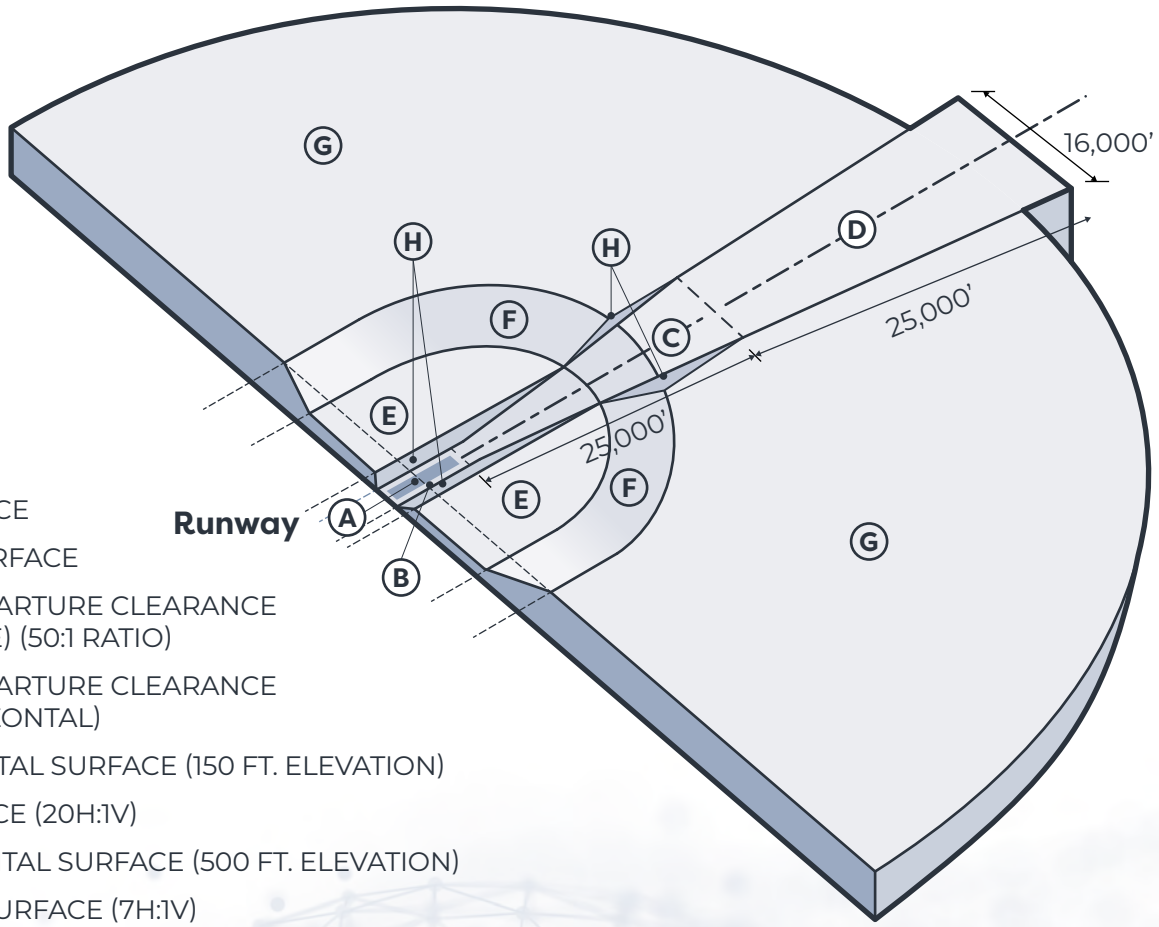
Figure 5-2 Clear Zones and Accident Potential Zones for MacDill AFB

5.2 IMAGINARY SURFACES

The DoD and Federal Aviation Administration (FAA) identify a complex series of imaginary planes and transition surfaces that together define the airspace that is required to remain free of obstructions around an airfield. Obstruction-free imaginary surfaces form a complex "bowl" around the airfield to ensure safe flight approaches, departures, and pattern operations. Obstructions include natural terrain and man-made features such as buildings, towers, poles, wind turbines, cell towers, and other vertical obstructions to airspace navigation.

There are different imaginary surfaces for fixed-wing runways (depending on the type of aircraft supported by the runway), as well as rotary-wing runways/helipads. **Figure 5-3** depicts the imaginary surfaces for typical Class B fixed-wing runways such as the runway at MacDill AFB (Runway 05/23). **Table 5-2** provides brief descriptions for each of these surfaces.

Figure 5-3 Imaginary Surfaces and Transition Planes for Class B Fixed-Wing Runways



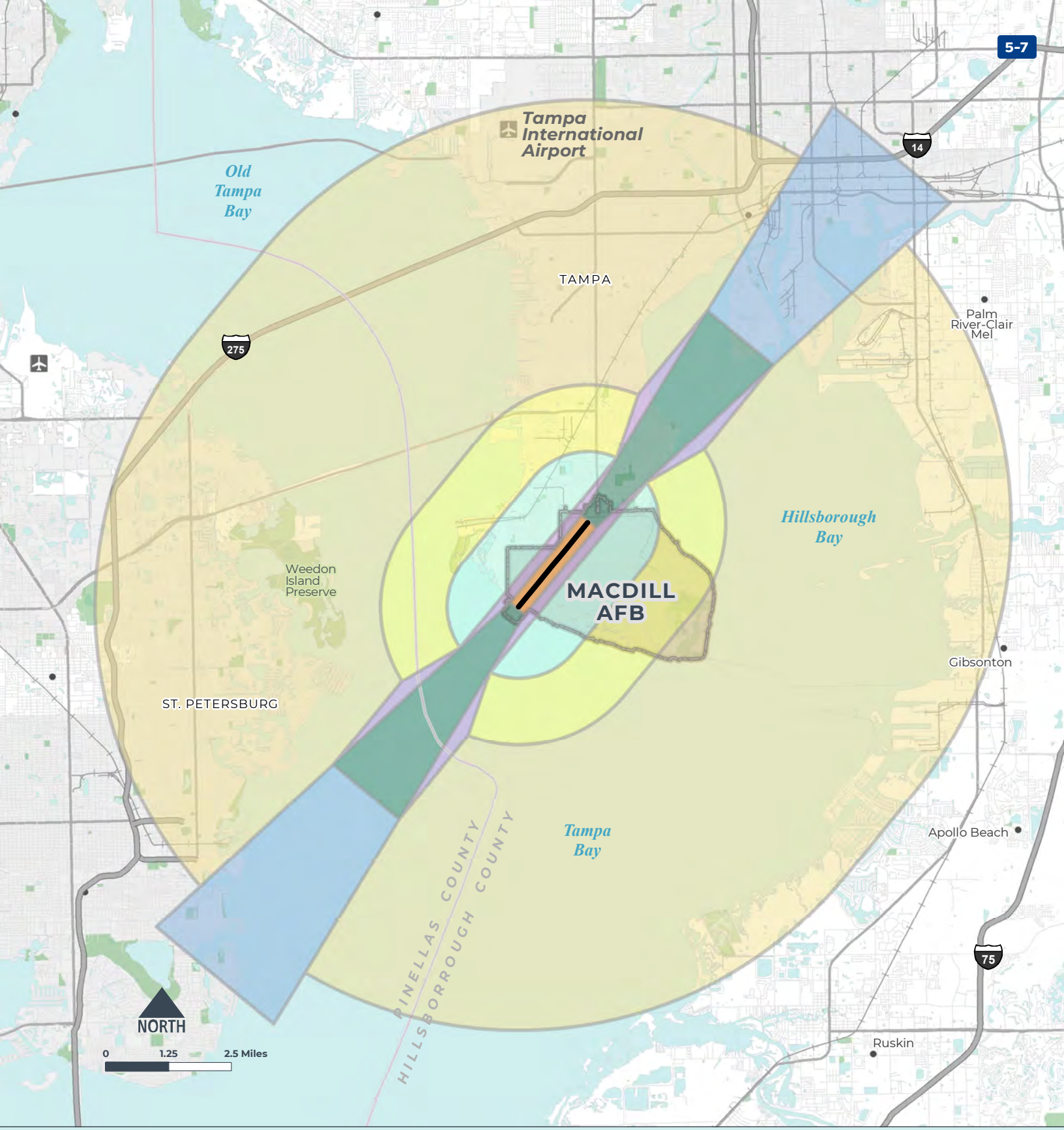
A. PRIMARY SURFACE
B. CLEAR ZONE SURFACE
C. APPROACH-DEPARTURE CLEARANCE SURFACE (SLOPE) (50:1 RATIO)
D. APPROACH-DEPARTURE CLEARANCE SURFACE (HORIZONTAL)
E. INNER HORIZONTAL SURFACE (150 FT. ELEVATION)
F. CONICAL SURFACE (20H:1V)
G. OUTER HORIZONTAL SURFACE (500 FT. ELEVATION)
H. TRANSITIONAL SURFACE (7H:1V)

TABLE 5-2

Descriptions of Imaginary Surfaces for Military Airfields with Class B Runways

Primary Surface	An imaginary surface symmetrically centered on the runway, extending 200 feet beyond each runway end that defines the limits of the obstruction clearance requirements near the landing area. The width of the primary surface is 2,000 feet, or 1,000 feet on each side of the runway centerline.
Approach-Departure Clearance Surface	An imaginary surface symmetrically centered on the extended runway centerline, beginning as an inclined plane (glide angle) at the end of the primary surface (200 feet beyond each end of the runway), and extending for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the starting point. The width of this surface at the runway end is 2,000 feet, flaring uniformly to a width of 16,000 feet at the end.
Inner Horizontal Surface	This imaginary surface is an oval plane at a height of 150 feet above the established airfield elevation. The inner boundary intersects with the approach-departure clearance surface and the transitional surface. The outer boundary is formed by scribing arcs with a radius of 7,500 feet from the centerline of each runway end and interconnecting these arcs with tangents.
Conical Surface	An inclined imaginary surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation. The slope of the conical surface is 20:1. The conical surface connects the inner and outer horizontal surfaces.
Outer Horizontal Surface	An imaginary surface that is located 500 feet above the established airfield elevation and extends outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.
Transitional Surface	An imaginary surface that extends outward and upward at an angle to the runway centerline and extended runway centerline at a slope of 7:1. The transitional surface connects the primary and the approach-departure clearance surfaces to the inner horizontal, the conical, and the outer horizontal surfaces.

Figure 5-4 depicts the actual runway airspace imaginary surfaces specific to MacDill AFB's Class B runway. In general, the Air Force does not permit above-ground structures on the primary surface (located on base), and height restrictions apply to transitional surfaces and approach and departure surfaces. Height restrictions are more stringent for areas closer to the runway and flight paths.



MACDILL AFB
RUNWAY
A: PRIMARY SURFACE
C: APPROACH DEPARTURE (50:1)
D: APPROACH DEPARTURE (HORIZONTAL)
E: INNER HORIZONTAL SURFACE
F: CONICAL SURFACE (20:1)
G: HORIZONTAL SURFACE
H: 7:1 TRANSITIONAL SURFACE

Figure 5-4 Imaginary Surfaces and Transition Planes for MacDill AFB

5.3 HAZARDS TO AIRCRAFT FLIGHT ZONE

Certain land uses and activities pose potential hazards to flight. To ensure land uses and activities are examined for compatibility, the Air Force has identified a Hazards to Aircraft Flight Zone (HAFZ). The HAFZ is the area within the outermost imaginary surfaces that are shown on Figure 5-4. Please note that the area and shape of the HAFZ may change with the encroachment issue at hand; at a minimum, the HAFZ encompasses the imaginary surfaces. For instance, issues related to Bird/Wildlife Aircraft Strike Hazard (BASH) may follow natural boundaries, encompass local bodies of water, and extend along flight paths. Unlike noise zones and safety zones, the HAFZ does not have recommended compatible land uses listed. Instead, it is a consultation zone, used for recommending that project applicants and local planning bodies consult with the Air Force to ensure their given project within a HAFZ is compatible with Air Force operations. These land use and activity compatibility considerations include:

HEIGHT

Tall objects can pose significant hazards to flight operations or interfere with navigational equipment (including radar). City/county agencies involved with approvals of permits for construction should require developers to submit calculations showing that projects meet the height restriction criteria of 14 Code of Federal Regulations (CFR) 77.17 for the specific airfield described in the AICUZ study. City and county agencies may also consider requiring a "Determination of No Hazard" be issued by the FAA for any tall objects within this zone.

VISUAL INTERFERENCE

Industrial or agricultural sources of smoke, dust, and steam in the airfield vicinity can obstruct a pilot's vision during takeoff, landing, or other periods of low-altitude flight. Close coordination between the installation and landowners can often mitigate these concerns. For example, irrigating before plowing can greatly reduce dust concerns.

LIGHT EMISSIONS

Bright lights, either direct or reflected, in the airfield vicinity can impair a pilot's vision, especially at night. A sudden flash from a bright light causes a spot, or "halo," to remain at the center of the visual field for a few seconds or more, rendering a person virtually blind to all other visual input. This is particularly dangerous for pilots at night, when the flash can diminish the eye's adaptation to darkness. The eyes partially recover from this flash in a matter of minutes, but full adaptation typically requires 40 to 45 minutes. Specific examples of light emissions that can interfere with the safety of nearby aviation operations include:

- **Lasers that emit in the visible spectrum,** which can be potentially harmful to a pilot's vision during both day and night
- **The increasing use of energy-efficient light-emitting diode (LED) lighting,** which poses potential conflicts in areas where pilots use NVG. NVG can exaggerate the brightness of these lights, interfering with pilot vision.
- **The use of red LED lights to mark obstructions,** which can produce an unintended safety consequence because red LED lights are not visible on most NVG models, rendering them invisible to NVG users in the area

BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD

Wildlife represents a significant hazard to flight operations. Birds, in particular, are drawn to different habitat types found in the airfield environment, including hedges, grass, brush, forest, water, and even the warm pavement of the runways. Due to the speed of the aircraft, collisions with wildlife can happen with considerable force. Although most bird and animal strikes do not result in crashes, they cause structural and mechanical damage to aircraft as well as loss of flight time.

Most aircraft collisions with birds or wildlife occur below 2,000 feet. To reduce the potential of a BASH incident, the Air Force recommends that land uses that attract birds not be located near installations with an active air operations mission. These land uses include:

- Waste disposal operations,
- Wastewater treatment facilities,
- Transfer stations,
- Landfills,
- Golf courses,
- Wetlands,
- Storm water ponds, and
- Dredge disposal sites.

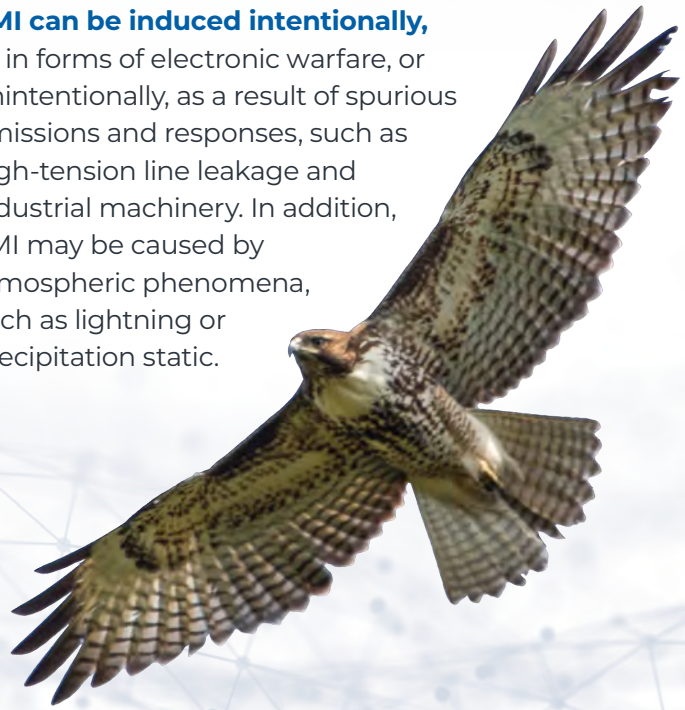
Birds and raptors in search of food or rodents will flock to landfills, increasing the probability of BASH occurrences near these facilities. One can also use design modifications to reduce the attractiveness of these types of land uses to birds and other wildlife.

MacDill AFB is surrounded by water on three sides. These water features and other land uses surrounding the airfield and installation could create a BASH concern. However, in response to the potential hazards surrounding the installation related to BASH, MacDill AFB has a robust BASH program that serves to address these concerns and create a safe flying environment. MacDill AFB Instruction 19-212 (September 2019) establishes the MacDill Air Force Base Bird Aircraft Strike Hazard (BASH) Program, which works toward minimizing aircraft exposure to potentially hazardous wildlife strikes. This BASH program also establishes the Bird Hazard Working Group to develop and implement plans and strategies to respond to the BASH threat that comes from a wide range of resident and migratory bird species and wildlife. In addition, MacDill AFB utilizes professionals from the U.S. Department of Agriculture, Animal and Plant Health Inspection Service and Wildlife Services, to assist in wildlife control both on the airfield and in surrounding areas.

RADIO FREQUENCY/ ELECTROMAGNETIC INTERFERENCE

The American National Standards Institute defines electromagnetic interference (EMI) as any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics/electrical equipment.

- **EMI can be induced intentionally,** as in forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, such as high-tension line leakage and industrial machinery. In addition, EMI may be caused by atmospheric phenomena, such as lightning or precipitation static.



- **New generations of military aircraft are highly dependent** on complex electronic systems for navigation and critical flight – and mission-related functions. Consequently, communities should use care when siting any activities that create EMI. Many of these sources are low-level emitters of EMI. However, when combined, they have an additive quality.
- **EMI also affects consumer devices,** such as cell phones, FM radios, televisions, and garage door openers. In some cases, the source of interference occurs when consumer electronics use frequencies set aside for military use.

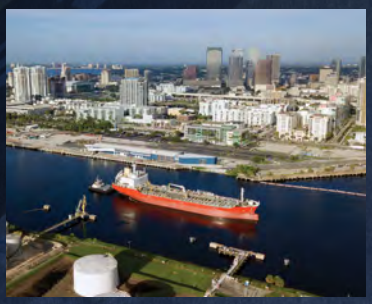
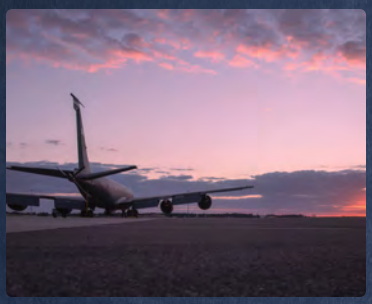
DRONES/UNMANNED AIRCRAFT SYSTEMS

The use of drones/unmanned aircraft systems (UAS) near military airfields poses a serious flight safety hazard due to the potential for a mid-air collision between military aircraft and small- to medium-sized drones. The FAA maintains specific guidance about where operators may fly drones/UAS. Currently, non-DoD drone operations are not permitted within certain zones surrounding military bases. Additional restrictions are in place around airports, sports stadiums, and security sensitive areas. For more information on drone use in and around DoD airfields, visit the FAA's website at: www.faa.gov/uas.

- **In 2015, the FAA created a new statutory requirement that applies to all privately owned, unmanned aircraft** that weigh more than 55 pounds. The FAA's goal is to allow the "opportunity to educate new aircraft users before they fly, so that they know the airspace rules and understand that they are ultimately accountable" and responsible for incidents that may occur as a result of their aircraft.
- **Presently, users are required to register aircraft** meeting the aforementioned requirements in a national database. The registration is web-based, and registrants will be required to provide a nominal fee of $5 per application. This registration will be valid for a period not to exceed 3 years.
- **The FAA distinguishes between recreational UAS flyers and commercial operators** and has a process for operation of these aircraft. Due to the ever-changing environment, drone operators should visit the FAA website (above) to ensure they have the most up-to-date guidance on how to legally and safely operate.
- **MacDill AFB is a "no drone zone,"** and drone activities and operations are not allowed within 5 miles of the installation. The installation has a counter-UAS program that is implemented by installation security forces to ensure policies are adhered to and aircraft can operate safely. Overall, drones have not been a major concern at MacDill AFB, but with the increase of recreational and commercial use of drones, this could become a more prominent issue.

NO DRONE ZONE


6


6 LAND USE COMPATIBILITY ANALYSIS

CZs, APZs, and noise zones, shown on **Figure 6-1,** and the HAFZ make up the AICUZ footprint for an air installation and are the basis for MacDill AFB's land use compatibility analysis. The AICUZ footprint defines the minimum recommended area within which land use controls are needed and requested to enhance the health, safety, and welfare of those living or working near a military airfield and to preserve the flying mission. The AICUZ footprint, combined with the guidance and recommendations set forth in the AICUZ study, are the fundamental tools necessary for the planning process to achieve overall land use compatibility. The Air Force recommends that local and regional governments adopt the AICUZ noise zones, CZs, APZs, and HAFZ into planning studies, regulations, and processes to promote compatible development around installations.

6.1 LAND USE COMPATIBILITY GUIDELINES AND CLASSIFICATIONS

In an effort to establish long-term compatibility for lands within the vicinity of military air installations, the DoD has created land use compatibility recommendations based on the *Federal Highway Administration's Standard Land Use Coding Manual (SLUCM)*. These guidelines are used by DoD personnel for on-installation planning and for engaging with the local community to foster compatible land use development off installation. **Table A-1 of Appendix A** shows the suggested land use compatibility guidelines within the CZs and APZs. **Table A-2 of Appendix A** provides land use compatibility recommendations within aircraft noise zones.

Section 6.4 presents the compatibility analysis and concerns within noise zones and APZs associated with MacDill AFB.

6.2 PLANNING AUTHORITIES, STAKEHOLDERS, AND POLICIES

This section presents information for each governing body that has land use jurisdictions near MacDill AFB, including descriptions of existing land uses and zoning, relevant stakeholder groups, and existing compatible planning policies and regulations.

STATE OF FLORIDA PLANNING AND GROWTH MANAGEMENT

The State of Florida has one of the most comprehensive and progressive land use planning programs in the country. The authority and responsibility for establishing and implementing the roles, processes, and powers of comprehensive planning programs to guide and control future development in the State of Florida is vested in the local governments. This is because local governments have the regulatory authority over the use of the land. As such, the local governments are the entity that issue development permits and regulate the land use patterns and community growth.

The land use planning program in Florida is commonly referred to as "Growth Management" and is found in a broad collection of laws, rules, regulations, and policies affecting all planning and development activities of the state and local governments.

In 1985, Florida enacted the Local Government Comprehensive Planning and Land Development Regulation Act, Chapter 163, Part II, Florida Statutes. This statute requires that all local governments adopt, maintain, and implement land use plans and development regulations for all future development actions. It also requires that all geographic areas within the state be included within the jurisdiction of a local comprehensive plan, and that all development actions be consistent with the adopted plan. All 67 counties and all of the cities and towns, as well as the Walt Disney World area, the Reedy Creek Improvement District, have satisfied this requirement.

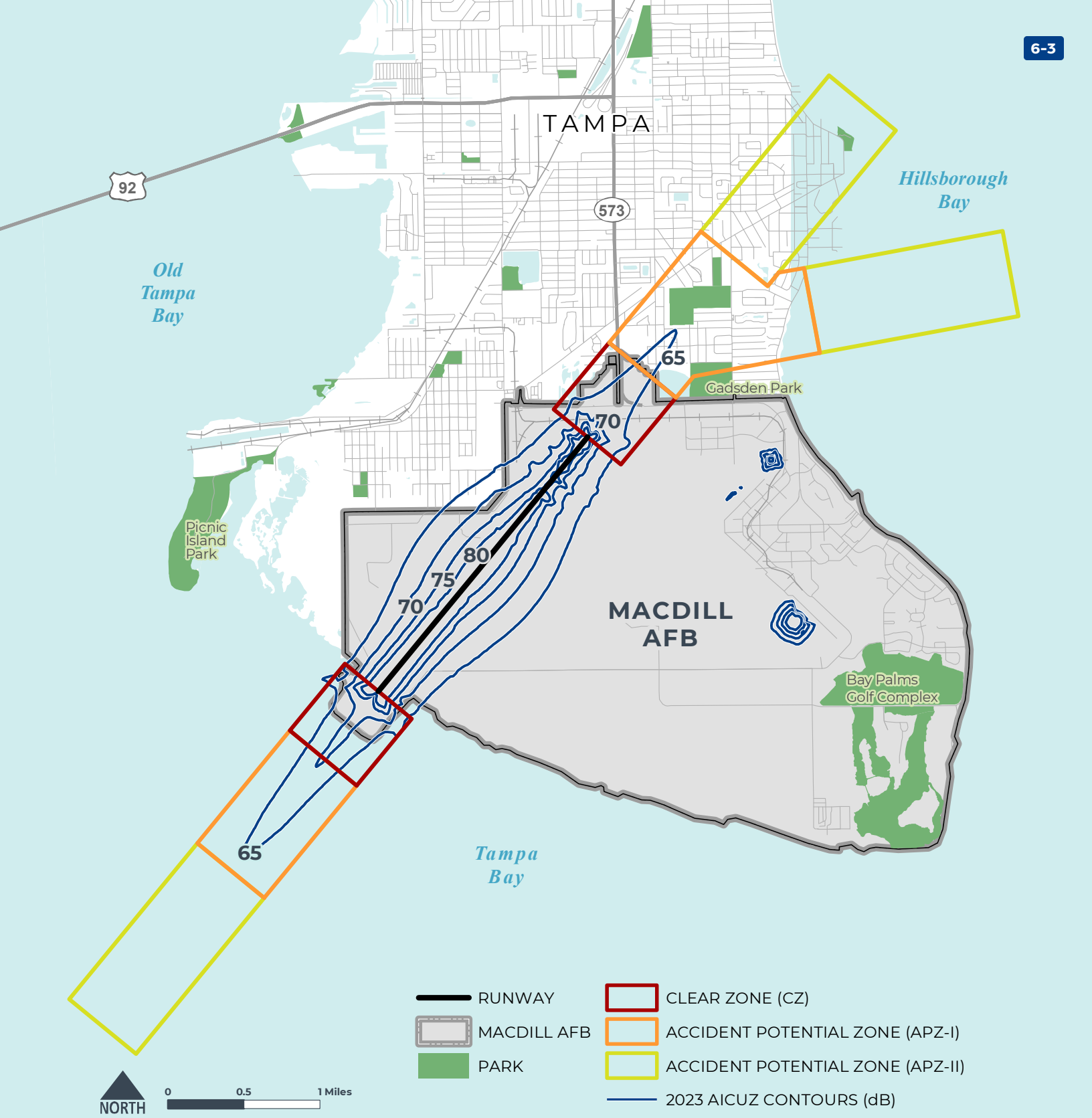


Figure 6-1 MacDill AFB Composite AICUZ Footprint

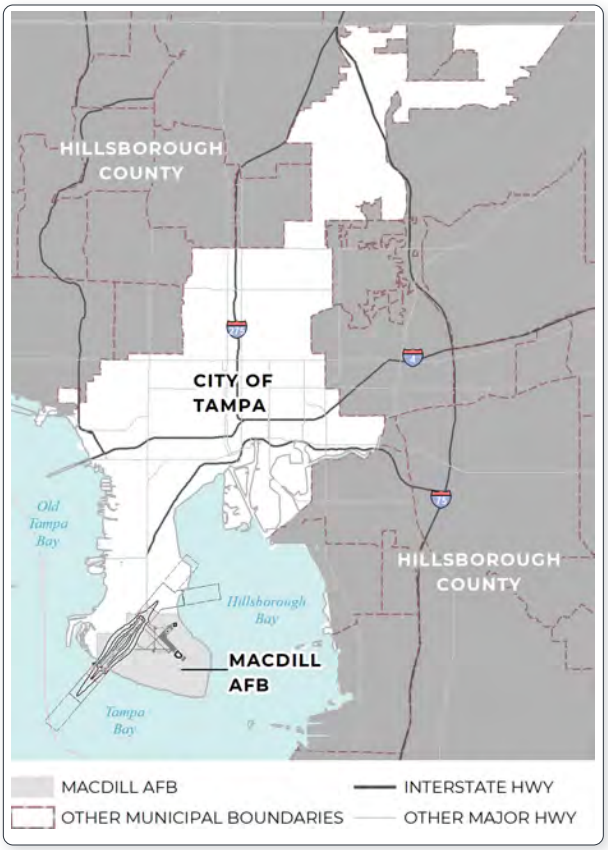
HILLSBOROUGH COUNTY CITY-COUNTY PLANNING COMMISSION (Planning Commission)

The Hillsborough County City-County Planning Commission (Planning Commission) is a planning body that makes recommendations to local officials pertaining to planning and development and is responsible for overall comprehensive planning. They review local government comprehensive plans and updates and have ten voting members and ex officio members, including MacDill AFB and the local school district. The Planning Commission conducts reviews of rezoning proposals for consistency with current plans in place and provides recommendations.

The Planning Commission prepared the current comprehensive plan for the City of Tampa (discussed below) and is currently working with the City to update their comprehensive plan expected to be published in the 2024/2025 timeframe.

CITY OF TAMPA

Within the City of Tampa, two departments are responsible for the overall planning and development within the city limits, providing different functions. The City of Tampa Department of Development and Growth Management's function is to ensure safe and affordable housing and commercial structures are compatible and compliant with applicable codes and ordinances. They provide review and oversight of proposed developments, and in the context of this AICUZ study, would be in a review capacity for compatibility related to the noise zones and APZs at MacDill AFB. This could include revising housing density limitations and coordination of potential height obstructions. Within the Department of Development and Growth Management, there are several



divisions, including construction services, architectural review and historic preservation, housing and community development, development coordination, and real estate.

The City of Tampa's City Planning Department also has a significant role in the overall planning and development within city limits, with a focus on long-term planning and special area plans. This department's goal is to guide growth, development and redevelopment of the City in a manner consistent with the citywide planning initiatives of the *Transforming Tampa's Tomorrow (T3) Strategy* to enhance the economic value, quality of life, community and resiliency of the City. The department works on implementation of the comprehensive plan and also provides land development code updates, support to one-time projects, and various other planning centric tasks.

KEY RECOMMENDATION

Local communities should continue work with MacDill AFB to ensure current information is available on proposed development projects in the vicinity of the installation **(i.e., within the MacDill AFB HAFZ – See Section 5.3)** and that a pathway for MacDill AFB to provide input regarding compatibility concerns is in place.

The current comprehensive plan for the City of Tampa was developed with assistance from the Planning Commission and titled *Imagine 2040: Tampa Comprehensive Plan*. An effort is currently underway to update the comprehensive plan, with an expected publishing timeframe of 2024/2025 and is being branded *Live, Grow, Thrive 2045* (https://planhillsborough.org/livegrowthrive2045). However, the current Imagine 2040 plan discusses the area around MacDill AFB and the importance of the installation in several Land Use (LU) objectives and policies, including (Planning Commission 2022):

- **LU Objective 8.3.** Support and strengthen the role of MacDill AFB by requiring that adjacent development be compatible with airport related activities.
- **LU Policy 8.3.1.** All new residential development within the MacDill AFB flight path, also known as the FAP I and II on the future land use map, shall be limited to 10 dwelling units per acre. Any property which received approval from Tampa City Council for a Future Land Use Map amendment or a rezoning prior to the effective date of Objective 8.3 and its associated policies, shall be allowed to develop in accordance with those approvals and the density and/or intensity allowed pursuant to those approvals shall not be reduced pursuant to Objective 8.3 and its associated policies. In the event of any conflict between the provisions and/or conditions of an approved Future Land Use Map amendment or an approved rezoning and Objective 8.3 and its associated policies, the provisions and/or conditions of approval shall prevail.

- **LU Policy 8.3.2. RESERVED**
- **LU Policy 8.3.3.** Prohibit new construction and redevelopment which inhibits the safe and efficient operation of airport facilities within the Flight Path areas for MacDill AFB.
- **LU Policy 8.3.4.** Prohibit future "noise sensitive" development such as residences, schools, hospitals, etc. which does not provide the required noise attenuation features within the noise contour areas adjacent to MacDill AFB which may pose health hazards.
- **LU Policy 8.3.5.** New development shall not obstruct aircraft operations by intersecting the airport's clear zones, approach zones, transition surface, horizontal surface, and conical surfaces.
- **LU Policy 8.3.6.** All building regulations (floor area ratios [FAR] and height) shall be promoted to guarantee the continued efficient operation of the airport and ensure public safety.
- **LU Policy 8.3.7.** Include MacDill AFB in the Development Review process to maintain open communication channels between City staff and these entities regarding all petitions for rezoning and special use requests generally within these flight areas.
- **LU Policy 8.3.8.** MacDill AFB representatives shall be included in the review of all proposed rezoning and plan amendments within the FP I and II Zones.
- **LU Policy 8.3.9.** Continue to consult MacDill AFB Air Installation Compatibility Use Zone Report (AICUZ)/Compatibility Use District (CUD) recommendations when addressing proposed land use changes within the FAP I and FP II areas.
- **LU Policy 8.3.10.** Continue to promote compatible development within the FP I and II Zones through maintenance of reduced densities.
- **LU Policy 8.3.11.** The City of Tampa and the Planning Commission shall continue to review the impacts of development, their visibility characteristics and penetration of airspace within the MacDill AFB's approach zones.
- **LU Policy 8.3.12.** Prohibit the construction of communication towers and antennas in the FP I and II zones.
- **LU Policy 8.3.13.** Continue to protect all access roads (Bayshore Boulevard, Dale Mabry Highway, Manhattan Avenue, and MacDill Avenue) leading to and from the base from private interest road closures in conjunction with established national defense access roads and military evacuation routes.
- **LU Policy 8.3.14.** No vertical development shall be permitted in the area mapped on the Adopted 2040 Future Land Use Map as the Clear Zone.
- **LU Policy 8.3.15.** The City of Tampa shall amend the *City of Tampa Code of Ordinances* to include noise attenuation measures to achieve an outdoor to indoor Noise Level Reduction (NLR) of a maximum of 30dB for residential development within the Day Noise Level (DNL) contour zones of the MacDill Air Force 2008 MacDill Air Installation Compatible Use Zone ("AICUZ") if the DNL is in excess of 70 dB, or a lesser dB for any portion of the property located in a lower DNL zone.

6.3 LAND USE AND PROPOSED DEVELOPMENT

The land use compatibility analysis evaluates existing and future land uses as well as zoning near MacDill AFB to determine compatibility conditions. Existing land use is assessed to determine current land use activity, and the future land use data set is used to determine potential compatibility with respect to where long-term development could take place. In addition, **Section 6.3.4** discusses proposed or potential developments surrounding MacDill AFB that also show where development trends are generally heading.

Land use and zoning Geographic Information System (GIS) data utilized were obtained from the City of Tampa and the Hillsborough County City-County Planning Commission in GIS format. The City of Tampa specifically maintains three land use and zoning datasets that are utilized as part of this AICUZ study, including existing land use, zoning and future land use.

In order to analyze the compatibility of nearby land uses surrounding MacDill AFB, each parcel is characterized into the following land use categories. While the specific categories used by each local government may vary, these generalized categories provide a starting point for each analysis. **Appendix A** of this study, *Land Use Compatibility Tables,* provides further description on the SLUCM land use categories along with notes on generally compatible uses for MacDill AFB's surrounding jurisdictions. **Appendix C** provides a table illustrating how the local land use designations were consolidated into the following categories:

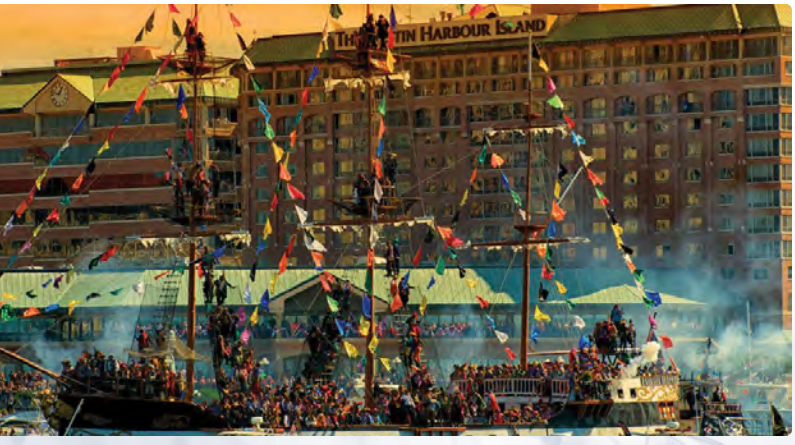
- **Residential.** Designations and zoning for family and private dwellings including rural/low-density development, medium-density, and high-density towers. Types of units include but are not limited to single-family detached dwellings; duplex, triplex, and quadplex structures; mobile homes or manufactured housing; and apartment buildings and condominiums.
- **Commercial.** Includes offices, retail stores, hospitality/restaurants, and other types of commercial establishments.
- **Industrial.** Includes manufacturing, warehouses, and other similar uses.
- **Public/Quasi-Public.** Includes publicly owned lands and utilities and land to which the public has access, including military reservations and training grounds, public buildings, schools, churches, parks, and hospitals.
- **Open/Agricultural/Low Density.** Passive open spaces and agricultural areas.
- **Transportation/Communication/Utilities.** Includes major and minor transportation systems and areas designated to support utilities, as well as rights-of-way (utilities and transportation).
- **Vacant/Undeveloped.** Includes undeveloped parcels.
- **Open Water.** Although this is not a designated land use, since much of the area within the CZ, APZs and noise contours is over water, these acreages were calculated to understand to complete size of the AICUZ footprint. However, the compatibility analysis only deals with land areas.

The land use compatibility analysis performed as part of this AICUZ study identifies both existing and future land uses near MacDill AFB to determine compatibility conditions.

Existing land use is assessed to determine current land use activity, while future land uses are used to project potential development and growth areas. Existing land use and parcel data provided by the City of Tampa were evaluated to ensure an actual account of land use activity regardless of conformity to zoning classification or designated planning or permitted use. Additionally, local management plans, policies, ordinances, and zoning regulations were evaluated to determine the type and extent of land use allowed in specific areas.

Generally speaking, the focus area for this AICUZ study from a land use compatibility standpoint is the area immediately around MacDill AFB. Most of the figures and land use/zoning discussions will concentrate on the southern portion of the City of Tampa – or south of Gandy, which is a main east-west road. The neighborhoods and development in these areas would be most pertinent to the MacDill AFB AICUZ Study.

This area includes a mix of land use types that are mostly consistent with the previous AICUZ study as the areas within the AICUZ footprint were fairly built-out at that time as well. However, there has been a small amount of infill development. Coordination between the City of Tampa, the Planning Commission and the installation is recommended to encourage compatible development in the areas surrounding MacDill AFB to ensure its continued viability and mission sustainment.



6.3.1 EXISTING LAND USES

As mentioned previously, MacDill AFB is located on a peninsula, surrounded to the west, south, and east by Old Tampa Bay, Tampa Bay and Hillsborough Bay, respectively. **Figure 6-2** presents the existing land uses for the area that surrounds MacDill AFB.

As illustrated on **Figure 6-2,** the area to the north of MacDill AFB (and south of Gandy) is essentially built out, and there are limited open spaces for new development. The primary existing land uses in this area are residential, followed by public/quasi-public, industrial and parks. The main transportation corridors in this area are Florida State Route 573, along with S. MacDill Avenue and S West Shore Boulevard, which all run north-south. In addition, Interbay Boulevard generally runs from the southwest to northeast. Numerous other secondary roads grid this area where there is commercial, retail, and other development.

The corridor along Interbay Boulevard has experienced a variety of development both within and immediately adjacent to the AICUZ footprint. This includes some industrial and commercial development at the intersection of Interbay Boulevard and Florida State Route 573, along with extensive single-family, multi-family residential housing as well as condominiums and apartments in the various side streets and neighborhoods. The Ballast Point Elementary School is located to the northeast of MacDill AFB within the AICUZ footprint, and there are other schools in close proximity.

In addition, Gadsden Park is located to the north of the installation boundary, and includes a lake, trails, playgrounds, and fields for sports. There are other parks within the AICUZ footprint, which include Skyview Park and MacDill 48 Park (located south of Interbay Boulevard west of S. MacDill Avenue) and Ballast Point Park (located on Interbay Boulevard along the Hillsborough Bay).

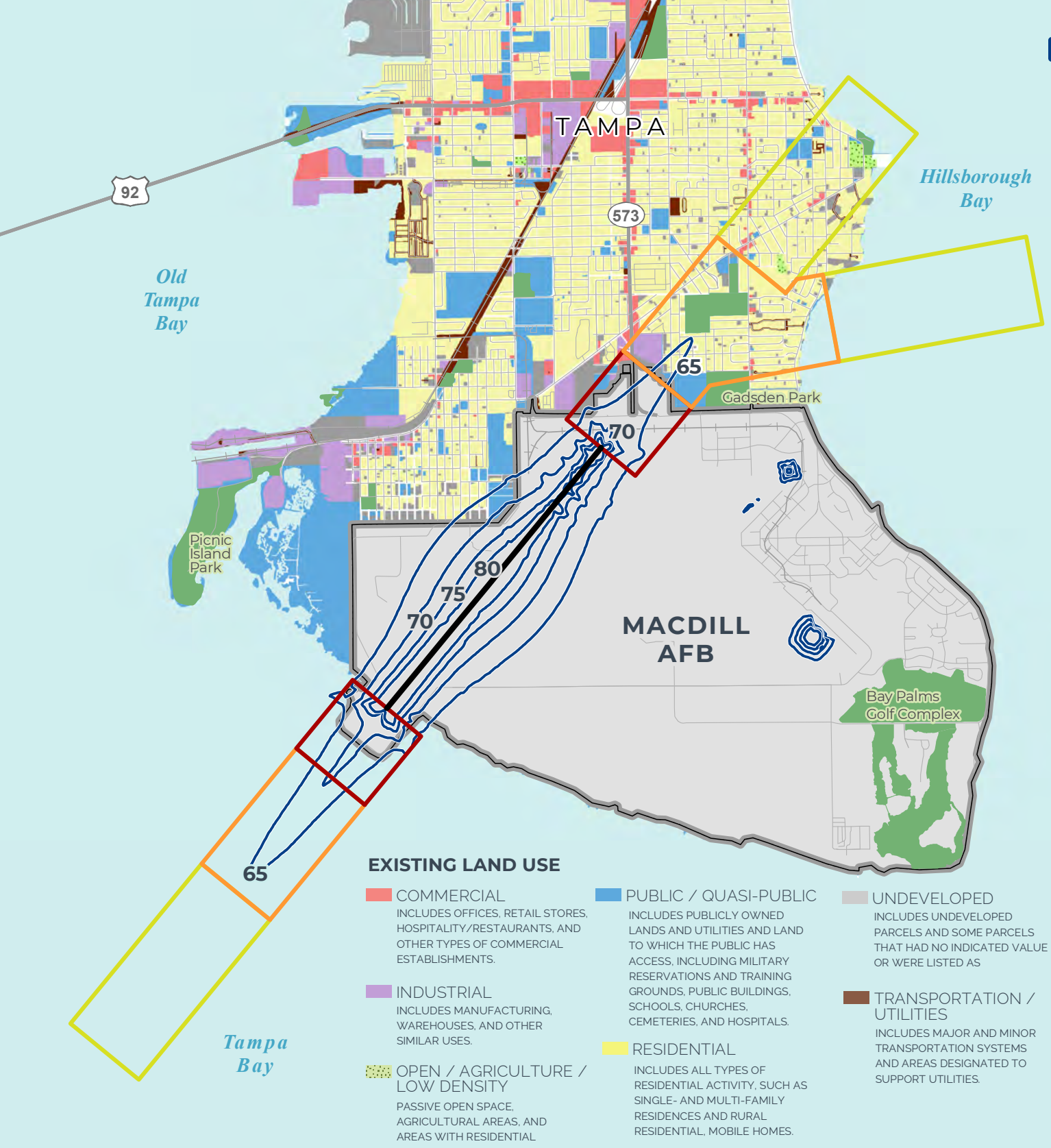


Figure 6-2 Existing Land Use and MacDill AFB Noise Contours, CZs, and APZs

It should be noted that the City of Tampa's dataset for existing land uses did not classify roads. Existing land uses were defined only for parcels; therefore, for the purposes of this AICUZ study, roadways were assigned to the "transportation/utility" category, which will allow for the acreage totals to be consistent between existing land use, zoning and future land use calculations.

There are no off-installation land areas covered by the AICUZ footprint to the southwest. Areas of specific land use compatibility concern within the MacDill AFB AICUZ noise contours, CZs, and APZs are further evaluated in **Section 6.4, Compatibility Concerns.**

6.3.2 CURRENT ZONING

Figure 6-3 presents an overlay of the 2023 MacDill AFB noise contours, CZs and APZs on a map showing the existing generalized zoning in the vicinity of the installation. **(For details on how the generalized zoning layer was created, see Appendix C).**

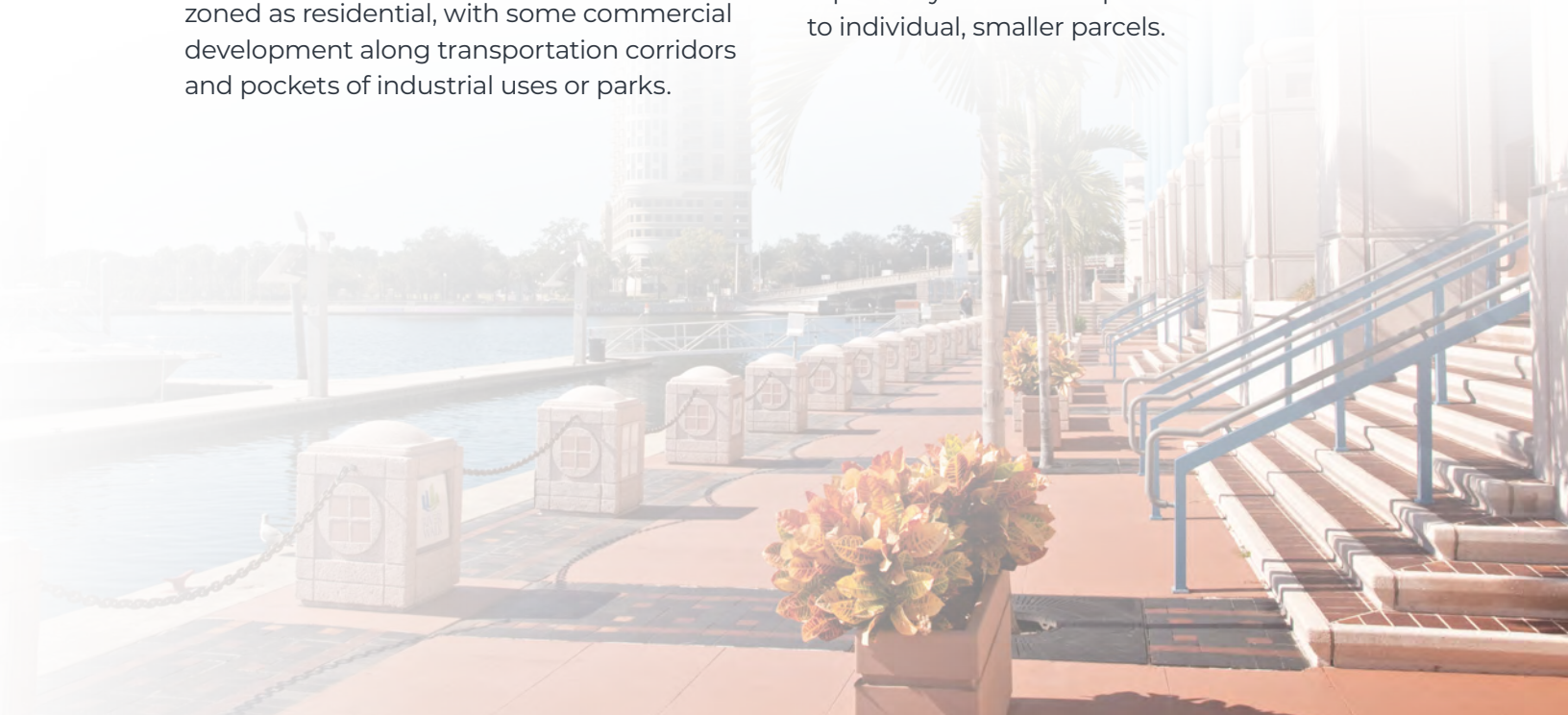
Land surrounding MacDill AFB generally reflects and is supportive of existing land use patterns north of the installation within the City of Tampa. The majority of these lands are zoned as residential, with some commercial development along transportation corridors and pockets of industrial uses or parks.

Due to the fact that this area of the City of Tampa has been primarily built out, there are relatively few parcels that are currently undeveloped, and where the zoning does not correspond to the existing land use.

6.3.3 FUTURE LAND USE

Figure 6-4 depicts future land uses in the area south of Gandy and north of MacDill AFB. This shows some industrial future land uses immediately outside and north of the main gate of the installation, then primarily residential future land uses with pocket parks throughout the different neighborhoods. Similar to zoning, the future land use layers mostly correspond to the existing land use layers, as these neighborhoods have been built and present for many years and there is not much vacancy or undeveloped parcels. Therefore, by the nature of the built-out environment, the existing and future land uses are consistent in most respects.

As noted in the City's comprehensive plan, the area around MacDill AFB is not in a designated growth area. In addition, many areas around the peninsula are in the Coastal High Hazard Area (CHHA), which also limits development. Therefore, the growth potential is primarily in-fill development and confined to individual, smaller parcels.



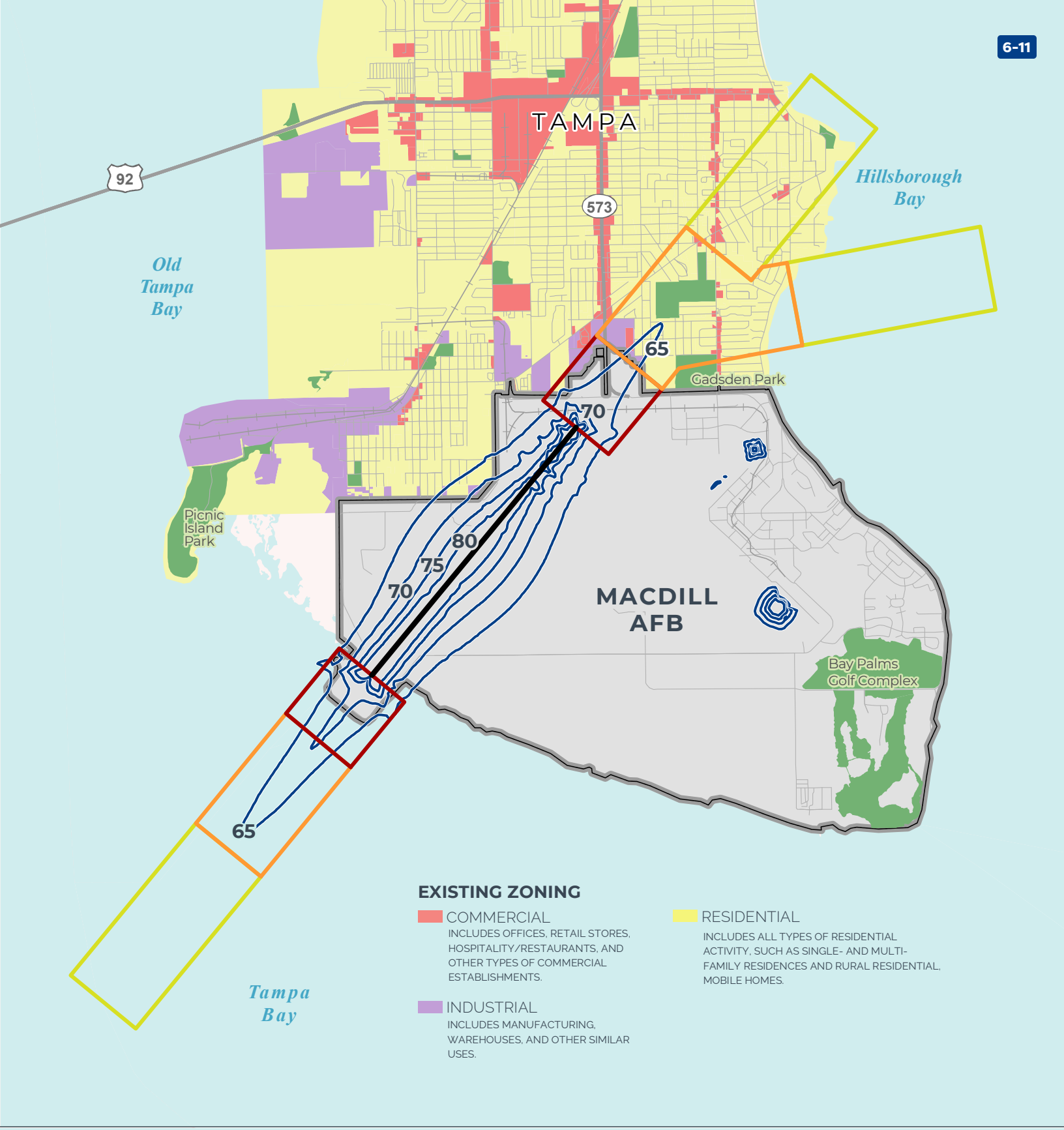
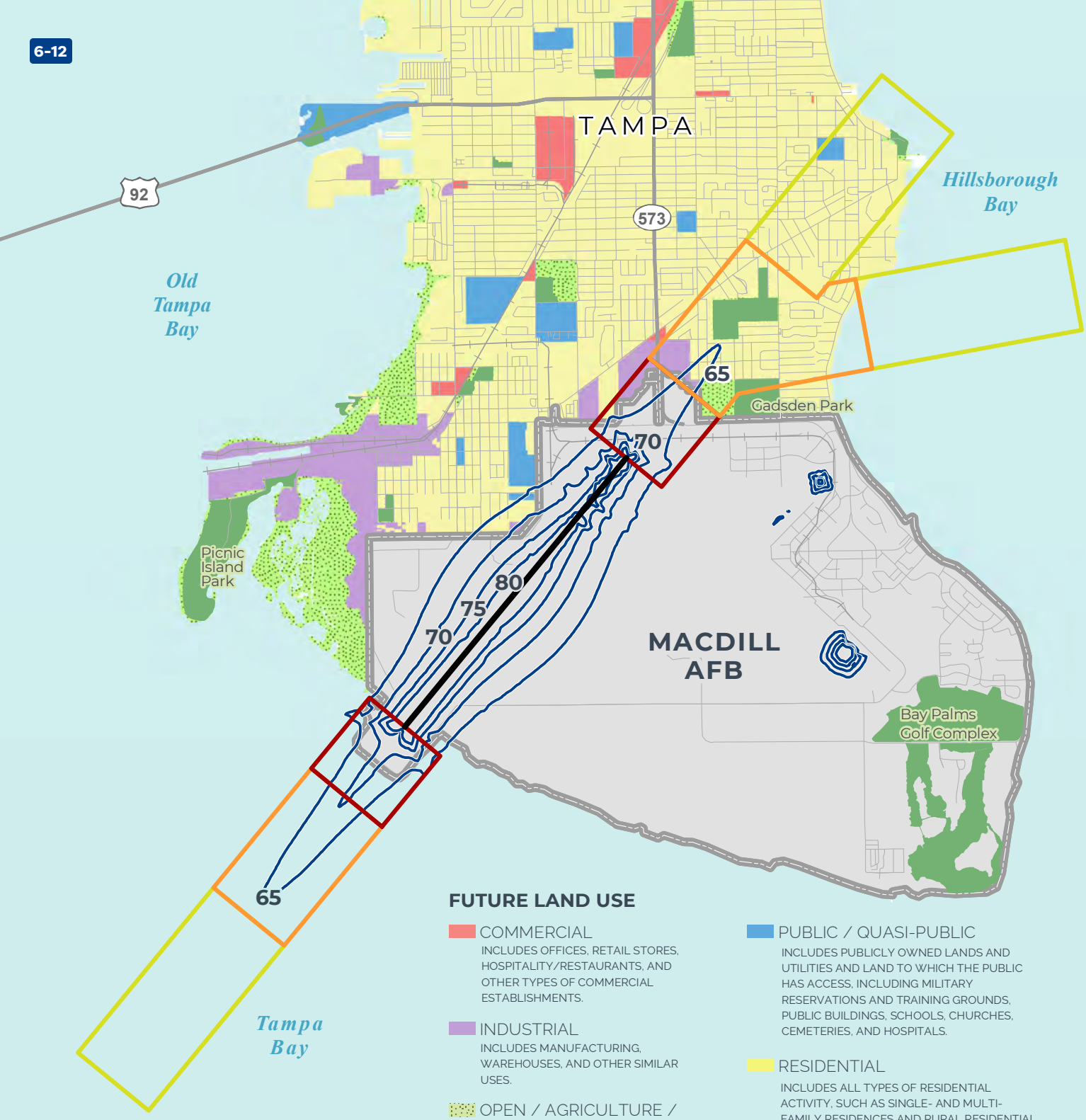


Figure 6-3 Existing Zoning and MacDill AFB Noise Contours, CZs, and APZs



FUTURE LAND USE

COMMERCIAL
INCLUDES OFFICES, RETAIL STORES, HOSPITALITY/RESTAURANTS, AND OTHER TYPES OF COMMERCIAL ESTABLISHMENTS.

INDUSTRIAL
INCLUDES MANUFACTURING, WAREHOUSES, AND OTHER SIMILAR USES.

OPEN / AGRICULTURE / LOW DENSITY
PASSIVE OPEN SPACE, AGRICULTURAL AREAS, AND AREAS WITH RESIDENTIAL ACTIVITY.

PUBLIC / QUASI-PUBLIC
INCLUDES PUBLICLY OWNED LANDS AND UTILITIES AND LAND TO WHICH THE PUBLIC HAS ACCESS, INCLUDING MILITARY RESERVATIONS AND TRAINING GROUNDS, PUBLIC BUILDINGS, SCHOOLS, CHURCHES, CEMETERIES, AND HOSPITALS.

RESIDENTIAL
INCLUDES ALL TYPES OF RESIDENTIAL ACTIVITY, SUCH AS SINGLE- AND MULTI-FAMILY RESIDENCES AND RURAL RESIDENTIAL, MOBILE HOMES.

RUNWAY
MACDILL AFB
PARK
CLEAR ZONE (CZ)
ACCIDENT POTENTIAL ZONE (APZ-I)
ACCIDENT POTENTIAL ZONE (APZ-II)
2023 AICUZ CONTOURS (dB)

NORTH
0 0.5 1 Miles

Figure 6-4 Future Land Use and MacDill AFB Noise Contours, CZs, and APZs

6.4 COMPATIBILITY CONCERNS

6.4.1 LAND USE ANALYSIS

Land use describes how land is developed, managed, and characterized by the dominant function occurring within an area. To compare land use consistently to AICUZ categories, generalized land use classifications are utilized. These generalized land use categories are not exact representations of the local community's land use designations, but they combine similar land uses like those introduced in **Section 6.3, Land Use and Proposed Development.**

For this analysis, the DoD AICUZ compatibility guidelines **(Tables A-1 and A-2 of Appendix A)** utilize the SLUCM standards to provide generalized land use classifications. **Table 6-1** provides generalized compatibility guidelines for the SLUCM categories. Land use compatibility falls into one of four categories: **(1) Compatible, (2) Compatible with Restrictions, (3) Incompatible, and (4) Incompatible with Exceptions.** The conditionally compatible land use categories (i.e., categories 2 and 4) may require incorporation of noise attenuation measures into the design and construction of structures and further evaluation to be considered "compatible." In addition, categories 2 and 4 may require density limitations for land in APZs or other modifications in order to be deemed compatible.

TABLE 6-1

Generalized Land Use Categories and Noise/Safety Compatibility[1]

Generalized Land Use Category	Noise Zone (dB DNL)								
	<65	65-69	70-74	75-79	80-84	85+	CZ	APZ I	APZ II
Residential	Yes	No[2]	No[2]	No	No	No	No	No	No[3]
Commercial	Yes	Yes	Yes[4]	Yes[4]	No	No	No	Yes[4]	Yes[4]
Industrial	Yes	Yes	Yes	Yes	Yes[4]	No	No	Yes[4]	Yes[4]
Public/Quasi-Public	Yes	Yes[4]	Yes[4]	Yes[4]	No	No	No	No	Yes[4]
Open/Agriculture/Low-Density	Yes	Yes[4]	Yes[4]	Yes[4]	Yes[4]	Yes[4]	No	Yes[4]	Yes[4]
Transportation/Communication/Utilities	Yes	Yes	Yes	Yes	Yes	No	No	Yes[4]	Yes
Vacant/Undeveloped	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Adapted from AFH 32-7084.

Key: Compatible Incompatible Compatible with Restrictions

Notes:

[1] This generalized table demonstrates the land compatibility guidelines. Refer to Appendix A for use in determining land use compatibility.

[2] Residential land uses within the greater than 65 dB DNL noise zone are considered incompatible. However, if residential uses are considered essential, noise-attenuation measures should be incorporated into the building structures.

[3] Residential land uses in APZ II are considered incompatible, with the exception of density less than two dwellings per acre.

[4] Compatible with restrictions.

6.4.2 EXISTING LAND USE COMPATIBILITY CONCERNS

NOISE ZONE COMPATIBILITY

As shown in **Table 6-2,** a total of 11.73 acres of residential land uses are within the greater than 65 dB DNL noise contour, and all of this acreage is considered incompatible. These residential areas comprise the only land uses considered incompatible or incompatible with exceptions within the AICUZ noise zones. **Figure 6-5** depicts these areas as well as the areas that are considered compatible.

TABLE 6-2

Off-installation Existing Land Use Acreage within Noise Zones

Designation	Generalized Land Use Category[1]	65-69	70-74	75-79	80+	Total
Incompatible or Incompatible with Exceptions	Residential	11.73		—	—	**11.73**
	Commercial	—	—	—	—	**0**
	Industrial	—	—	—	—	**0**
	Public/Quasi-Public	—	—	—	—	**0**
	Transportation/Utility	—	—	—	—	**0**
	Open/Agriculture/Low-Density	—	—	—	—	**0**
	Undeveloped/Vacant	—	—	—	—	**0**
Compatible or Compatible with Restrictions	Residential	—	—	—	—	**0**
	Commercial	—	—	—	—	**0**
	Industrial	0.34	—	—	—	**0.34**
	Public/Quasi-Public	22.33	5.25	—	—	**27.58**
	Transportation/Utility	9.59	0.01	—	—	**9.60**
	Open/Agriculture/Low-Density	—	—	—	—	**0**
	Undeveloped/Vacant	10.03	—	—	—	**10.03**
Subtotals	**Incompatible**	**11.73**	**0**	**0**	**0**	**11.73**
	Compatible	**42.29**	**5.26**	**0**	**0**	**47.55**
Total		**54.02**	**5.26**	**0**	**0**	**59.28**

Notes: All noise contour areas on the installation are excluded from the counts, as well as areas over open water.

[1] Refer to Appendix A for details.

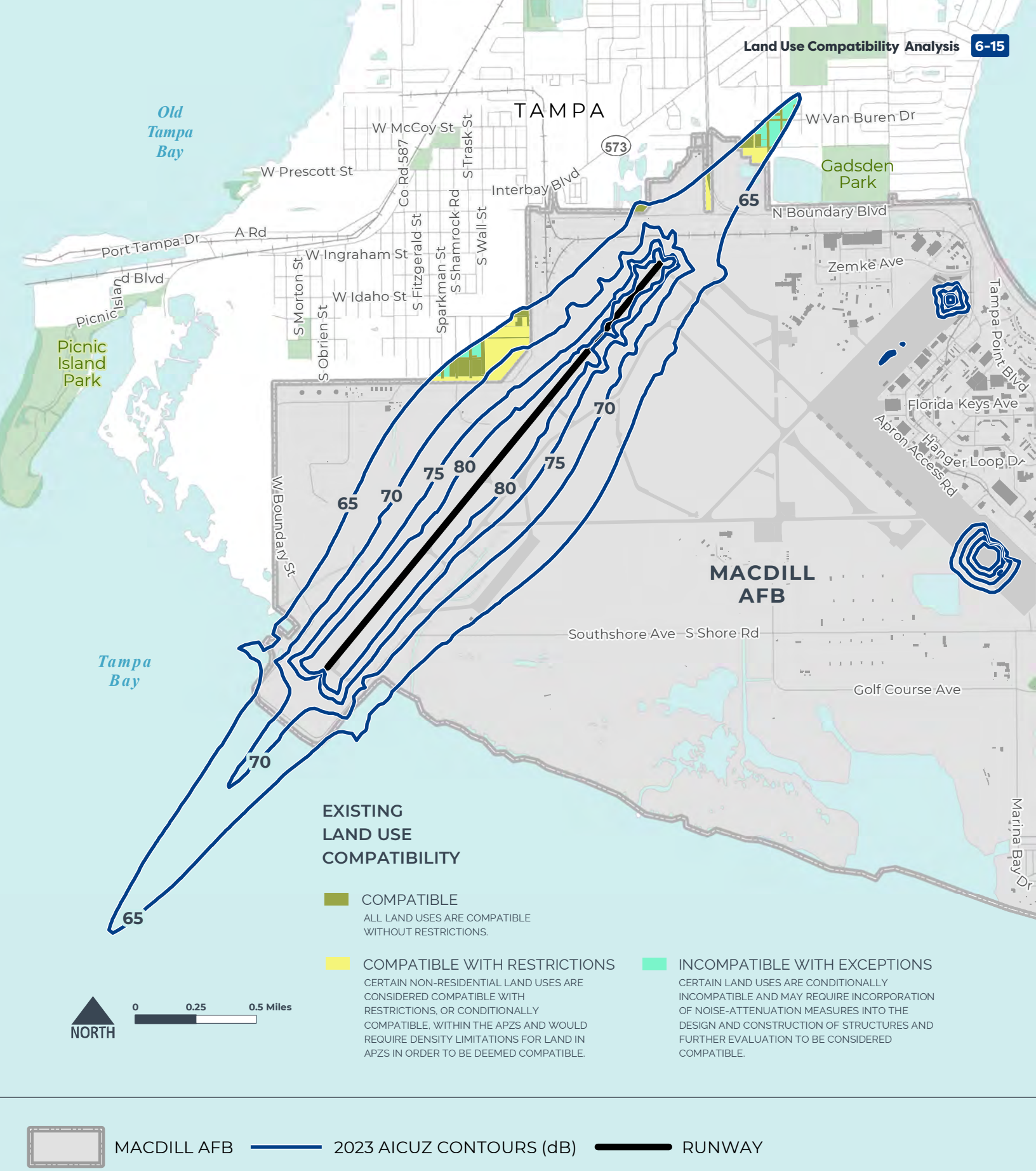
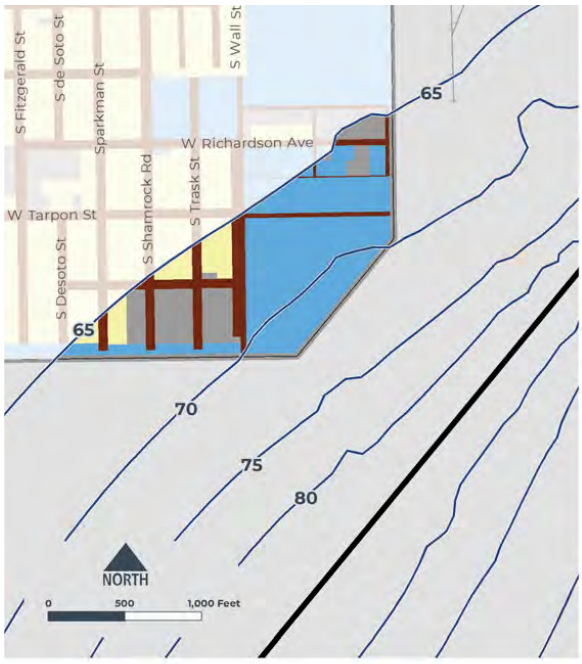


Figure 6-5 Incompatible Existing Land Use within Noise Contours

KEY RECOMMENDATION

With respect to Noise Level Reduction (NLR) standards in Tampa, developers and local governments should refer to **Appendix A** of this AICUZ Study and *Chapter 31, Section 3114, Airport Noise, of the Florida Building Code*

https://up.codes/viewer/florida/fl-building-code-2017/chapter/31/special-construction#3114.1



Approximately 47.55 acres (or over 80 percent) of the total acreage within the noise zones for MacDill AFB is considered compatible, including conditionally compatible (compatible with restrictions), with aircraft operations. Of the 47.55 acres that is compatible (including compatible with restrictions), over half falls into the public/quasi-public land use category, primarily within the 65 to 69 dB DNL noise zone.

Areas within the 65 dB DNL or greater noise contour that are considered compatible or compatible with restrictions includes public/quasi-public lands, undeveloped/vacant lands, transportation/utility rights-of-way and industrial uses. A portion of the public/quasi-public land is to the northwest of the runway, south of W. Richardson Avenue and in the vicinity of the 65 dB DNL noise contour where other residential growth has taken place. However, the remaining vacant parcels are primarily public/quasi-public or industrial, and therefore would expect to not be developed into residential uses which would be incompatible. As noted within the future land use discussion in **Section 6.4.3,** this area has a future land use designation of residential. This discrepancy should be monitored or amended to reflect the conditions and development that would be most appropriate in these noise zones.

Overall, the noise contours do not extend over a significant amount of off-installation land, and where they do extend outside of MacDill AFB property, they are mostly compatible.

ACCIDENT POTENTIAL ZONE COMPATIBILITY

With respect to land use compatibility within the MacDill AFB AICUZ Study APZs, as shown in **Table 6-3,** the vast majority of CZs associated with the airfield are contained within the installation boundary. However, a small portion does extend north of the installation boundary. Larger portions of both APZ I and APZ II extent to the northeast of the installation, while all CZs and APZs extending to the southwest are either on installation property or over open water.

TABLE 6-3

Off-Installation Existing Land Use Acreage within AICUZ Clear Zones and APZs for MacDill AFB

Designation	Generalized Land Use Category[1]	CZ	APZ I	APZ II	Total
Incompatible or Incompatible with Exceptions	Residential	0.30	244.80	245.74	**490.84**
	Commercial	4.32	—	—	**4.32**
	Industrial	2.58	—	—	**2.58**
	Public/Quasi-Public	14.92	100.30	11.49	**126.71**
	Transportation/Utility	6.09	—	—	**6.09**
	Open/Agriculture/Low-Density	—	—	—	**0**
	Undeveloped/Vacant	—	—	—	**0**
Compatible or Compatible with Restrictions	Residential	—	—	—	**0**
	Commercial	—	3.67	7.45	**11.12**
	Industrial	—	20.12	—	**20.12**
	Public/Quasi-Public	—	—	14.29	**14.29**
	Transportation/Utility	—	84.91	72.63	**157.54**
	Open/Agriculture/Low-Density	—	—	16.80	**16.80**
	Undeveloped/Vacant	7.90	24.65	20.66	**53.21**
Subtotals	**Incompatible**	**28.21**	**345.10**	**257.23**	**630.54**
	Compatible	**7.90**	**133.34**	**131.83**	**273.07**
Total		**36.11**	**478.44**	**389.06**	**903.61**

Notes: All Clear Zones and Accident Potential Zones on the installation are excluded from the counts, as well as areas over open water.

[1] Refer to Appendix A for details.

For the balance of land within the MacDill AICUZ Study APZs that cover off-installation areas, the majority is considered incompatible or incompatible with exceptions. Approximately 273.07 acres (or 30.2 percent) are considered compatible or compatible with restrictions, while 630.54 acres (or 69.8 percent) are considered incompatible or incompatible with exceptions. This is primarily due to the high amount of residential development within these areas (490.84 acres), as well as public/quasi-public land uses (126.71 acres), which are both considered incompatible or incompatible with exceptions within APZs. **Figure 6-6** illustrates the compatibility of areas within the MacDill AFB AICUZ Study APZs.

It should be noted that the Ballast Point Elementary School located on W. Ballast Point Boulevard has an existing land use of public/quasi-public, which would typically be considered compatible with restrictions. However, as the school would not meet the restrictions in terms of density of development (people per acre), it is considered incompatible.

Areas within the MacDill AFB APZs that are considered incompatible include residential (within both APZs I and II). In APZ II, a maximum density of two dwelling units per acre for residential land uses could be considered compatible; however, all other residential uses are considered incompatible. The area within the MacDill AFB AICUZ footprint for APZ II has a higher density of two dwelling units per acre; therefore, it is considered incompatible.

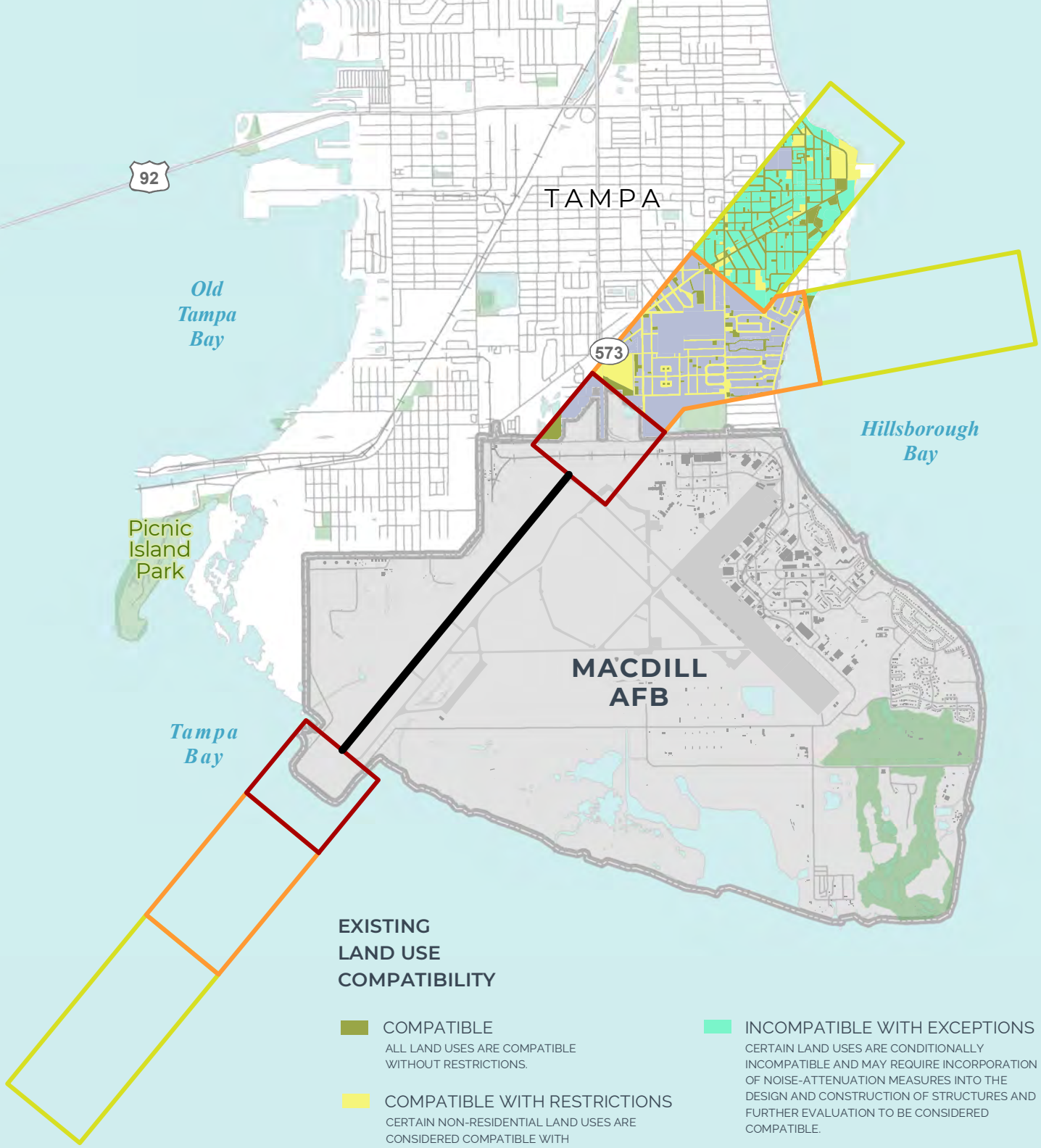
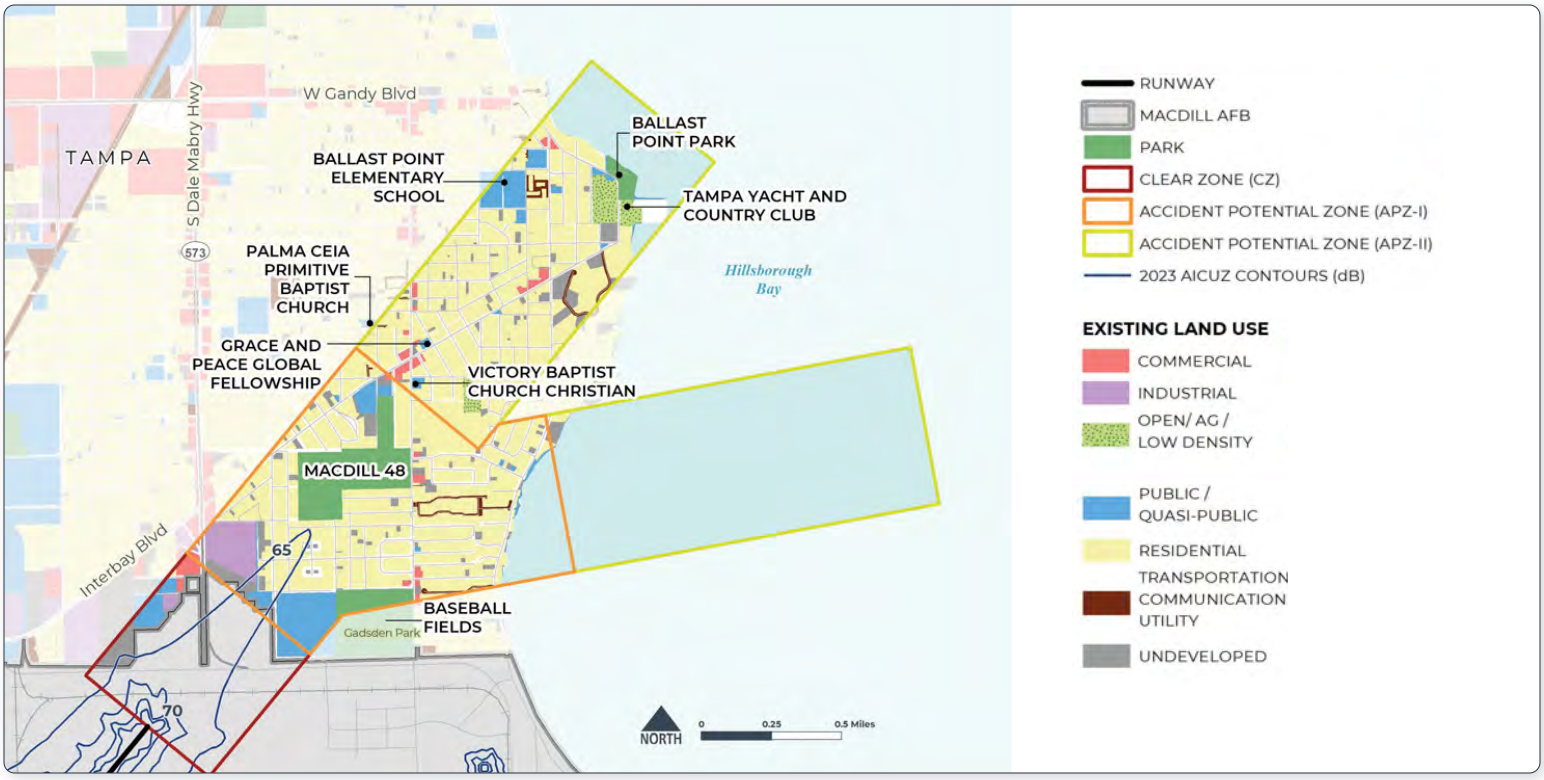


Figure 6-6 Incompatible Existing Land Use within CZs and APZs



LAND USES AND COMPATIBILITY AT RUNWAY END

Oftentimes, as these are areas where there could be higher noise contours present, and most often where the APZs are located due to arrival and departure patterns. The inset above present the existing land uses and discussion related to these specific areas off the end of Runway 23.

This inset shows the existing land uses and various community assets northeast of Runway 23, including parks, schools and churches. As noted within this section, people-intensive uses are discouraged within the APZs; therefore, many of these would be considered incompatible along with the residential homes. These neighborhoods were developed prior to the implementation of the current density of development restrictions enforced by the City of Tampa and are considered nonconforming land uses within the AICUZ footprint.

6.4.3 FUTURE LAND USE COMPATIBILITY CONCERNS

Off station land outside of MacDill AFB boundaries exposed to the noise contours and APZs are shown on **Figures 6-7 and 6-8** below, and future land use compatibility acreages are provided in **Tables 6-4 and 6-5.**

There are some differences in the existing land uses versus future land uses, which impact the compatibility calculations. Specifically, the area south of W. Richardson Avenue has an existing land use of public/ quasi-public, but for future land use is a combination of residential, industrial and public/quasi-public. In addition, there are areas within the CZ that have different existing land uses versus future land uses. Overall, the future land uses in APZ I and APZ II are primarily residential without the pockets of commercial, industrial, and other types of development that are shown in the existing land use data.

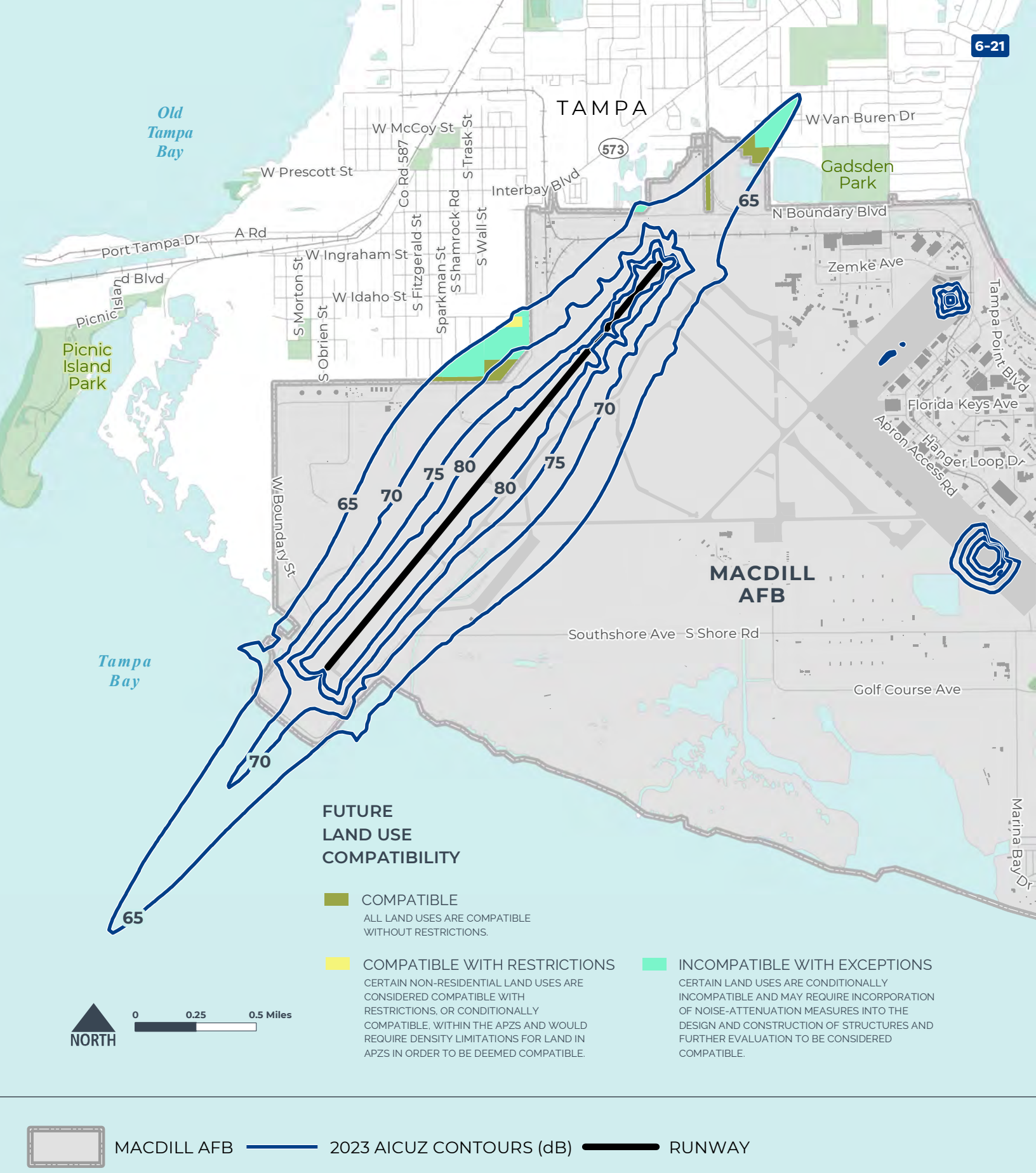


Figure 6-7 Incompatible Future Land Use within Noise Contours

TABLE 6-4

Off-Installation Future Land Use Acreage within AICUZ Noise Zones for MacDill AFB

Designation	Generalized Land Use Category[1]	65-69	70-74	75-79	80+	Total
Incompatible or Incompatible with Exceptions	Residential	40.23	1.48	—	—	**41.70**
	Commercial	—	—	—	—	**0**
	Industrial	—	—	—	—	**0**
	Public/Quasi-Public	—	—	—	—	**0**
	Transportation/Utility	—	—	—	—	**0**
	Open/Agriculture/Low-Density	—	—	—	—	**0**
	Undeveloped/Vacant	—	—	—	—	**0**
Compatible or Compatible with Restrictions	Residential	—	—	—	—	**0**
	Commercial	—	—	—	—	**0**
	Industrial	11.82	3.78	—	—	**15.60**
	Public/Quasi-Public	1.77	—	—	—	**1.77**
	Transportation/Utility	—	—	—	—	**0**
	Open/Agriculture/Low-Density	0.21	—	—	—	**0.21**
	Undeveloped/Vacant	—	—	—	—	**0**
Subtotals	**Incompatible**	**40.23**	**1.48**	**0**	**0**	**41.70**
	Compatible	**13.80**	**3.78**	**0**	**0**	**17.58**
Total		**54.03**	**5.26**	**0**	**0**	**59.28**

Notes: All noise contour areas on the installation are excluded from the counts, as well as areas over open water.

[1] Refer to Appendix A for details.

NOISE ZONE COMPATIBILITY

Approximately 41.70 acres of land (or 70-percent) are considered incompatible with the noise contours in which they are located. These are all residential areas that are within the 65 dB DNL noise contour or greater **(see Table 6-4).** The portion of acreage located south of W. Richardson Avenue that is considered incompatible has some residential homes along S. Trask Street, S. Wall Street, and S. Sparkman Street that are within the 65 dB DNL noise contour. However, much of the land remains vacant and currently undeveloped at this time. Efforts should be made to either keep these areas undeveloped or encourage development that would be compatible with the noise contour in which it is located.

TABLE 6-5

Off-Installation Future Land Use Acreage within AICUZ Clear Zones and APZs for MacDill AFB

Designation	Generalized Land Use Category[1]	CZ	APZ I	APZ II	Total
Incompatible or Incompatible with Exceptions	Residential	7.79	353.03	367.00	**727.82**
	Commercial	—	—	—	**0**
	Industrial	22.44	—	—	**22.44**
	Public/Quasi-Public	—	—	12.44	**12.44**
	Transportation/Utility	—	—	—	**0**
	Open/Agriculture/Low-Density	5.88	—	—	**5.88**
	Undeveloped/Vacant	—	—	—	**0**
Compatible or Compatible with Restrictions	Residential	—	—	—	**0**
	Commercial	—	0.08	—	**0.08**
	Industrial	—	33.22	—	**33.22**
	Public/Quasi-Public	—	—	—	**0**
	Transportation/Utility	—	—	—	**0**
	Open/Agriculture/Low-Density	—	92.10	9.63	**101.73**
	Undeveloped/Vacant	7.90	24.65	20.66	**0**
Subtotals	**Incompatible**	**36.11**	**353.03**	**379.44**	**768.58**
	Compatible	**0**	**125.40**	**9.63**	**135.03**
Total		**36.11**	**478.43**	**389.07**	**903.61**

Notes: All Clear Zones and Accident Potential Zones on the installation are excluded from the counts, as well as areas over open water.
[1] Refer to Appendix A for details.

The other area in which the noise contours are off-installation property is to the northeast along W. Van Buren Drive. This area is a built-out residential neighborhood and there is little room for additional future development.

All other land uses, including industrial, public/quasi-public and open/agriculture/low-density development are considered compatible or compatible with restrictions.

ACCIDENT POTENTIAL ZONE COMPATIBILITY

Over 768 acres (or 85-percent) of the land area within the APZs and CZs associated with MacDill AFB would be considered incompatible or incompatible with exceptions **(see Table 6-5).** This primarily is made up of residential land uses (over 727 acres), but also includes other future land uses within the CZ **(see also Figure 6-8).** These are considered pre-existing, non-conforming land uses.

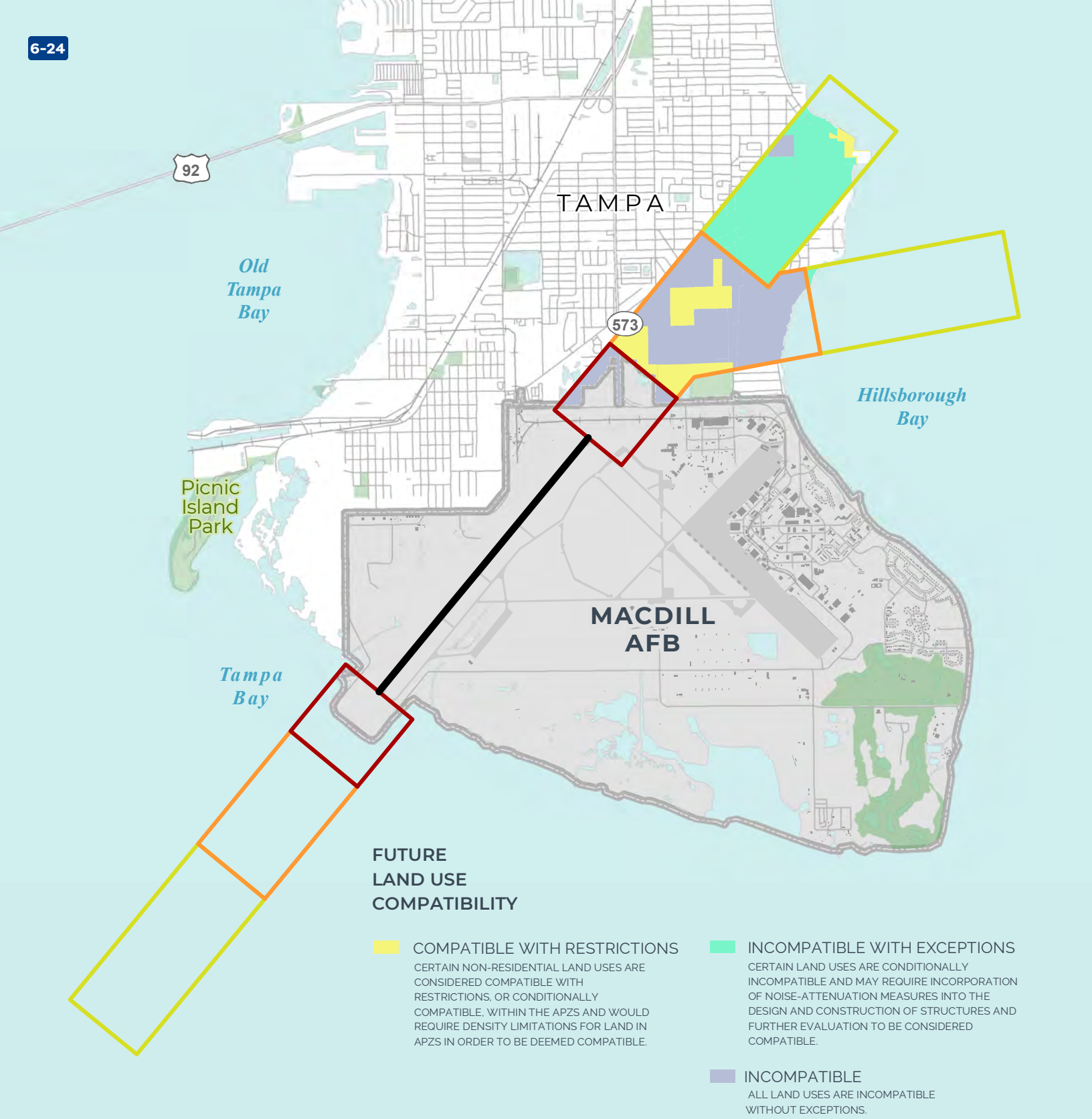


Figure 6-8 Incompatible Future Land Use within CZs and APZs

As illustrated in **Figure 6-8,** the only areas within APZ I and APZ II that would be considered compatible or compatible with restrictions using the future land use data would be industrial areas and open/agriculture/low-density developments (i.e., parks).

It should be noted, similar to the discussion in the existing land use section, the Ballast Point Elementary School located on W. Ballast Point Boulevard has a future land use of public/quasi-public. This would typically be considered compatible with restrictions; however, as the school would not meet the restrictions in terms of density of development (people per acre), it is considered incompatible.

6.4.4 FUTURE GROWTH AREAS AND PROPOSED DEVELOPMENT PROJECTS AROUND MACDILL AFB

There are no existing or proposed projects within the MacDill AFB AICUZ footprint that warrant major concern from the standpoint of compatibility with MacDill AFB aircraft operations. In general, growth trends in this region are occurring away from MacDill AFB to the north of Gandy Boulevard, or along the western portion of the peninsula along S. West Shore Boulevard.

Areas that are close to an air station but fall outside the formally designated AICUZ footprint are sometimes referred to as "white spaces." These areas are outside of where AICUZ-focused land use planning recommendations are formally applied (such as properties adjacent to the APZs or housing just outside the 65 dB DNL noise zone). These areas exist in all regions around bases where land development rules may vary, regulatory authority is broad, and long-term development strategies do not necessarily consider AICUZ concepts, but their potential impact on the installation's mission is real.

The primary focus of an AICUZ study is land use within the safety and noise zones. This analysis is to promote the long-term sustainment of the military defense mission. Outside of the AICUZ footprint, there are many developments or land uses that may impact the continued success of the military mission. Most of these reside within the HAFZ, a recommended zone within which the local municipality should consider consulting with the military/base to ensure the proposed development does not negatively impact either the community or the military mission. While the AICUZ study does not analyze these potential projects individually, certain future projects and/or development areas were identified within the MacDill AFB HAFZ that warrant attention from a land use compatibility standpoint.

These developments include rezoning and redevelopment of parcels along the western portion of the peninsula, where some parcels formerly zoned as industrial are being converted to residential uses. In addition, a parcel located just outside of the MacDill AFB main gate, located within APZ I, that has long been discussed for different types of development. Recently, it has been proposed to be a warehouse distribution center for Amazon, where the developer, City of Tampa, State of Florida, and MacDill AFB worked together on ensuring would be compatible with the installation's operations and mission. Although it will be a large facility, there will be relatively few people within the APZ and therefore, a successful example of working collaboratively to ensure public health and safety as well as mission assurance long-term.

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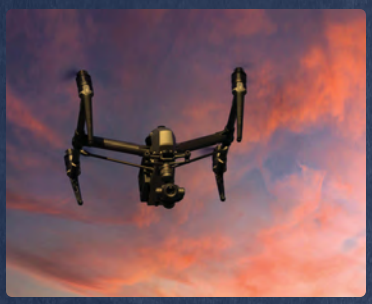
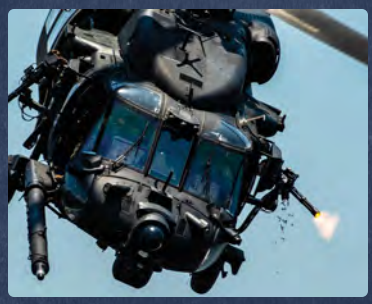




7 IMPLEMENTATION

Implementation of this AICUZ study must be a joint effort between MacDill AFB and the surrounding communities. This AICUZ study provides the best source of information to ensure land use planning decisions made by local municipalities are compatible with a future installation presence. This chapter discusses the roles of all partners in the collaborative planning.

7.1 MILITARY ROLE

The goal of the AICUZ Program is to assist local, regional, state, and federal officials in protecting the health, safety, and welfare of the public by promoting long-term land use compatible with military operations, and to protect Air Force operational capability from the effects of incompatible land use. This program helps mitigate noise and safety concerns for the surrounding communities and advises these communities about potential impacts from flight operations on the safety, welfare, and quality of life of their citizens. The Air Force promotes compatible partnerships between its installations and surrounding communities by being a good neighbor.

MacDill AFB is responsible for flight safety, noise abatement, and participation in existing local jurisdictional land use planning processes as part of its AICUZ Program responsibilities. Air Force policy and guidance require that installation leadership periodically review existing practices for flight operations and evaluate these practices in relationship to populated areas and other local situations.

MACDILL AFB WILL:

- **Ensure that, wherever possible, air operations planners route flights over sparsely populated areas** to reduce the exposure of lives and property to a potential accident.
- **Periodically review existing traffic patterns, instrument approaches, weather conditions, and operating practices** and evaluate these factors in relationship to populated areas and other local conditions. The purpose of this review is to limit, reduce, and control the impact of noise from flying operations on surrounding communities.
- **Consider the establishment of a community forum** between the installation and surrounding stakeholders to discuss land use and other issues of concern; the installation anticipates holding these meetings on an annual basis.
- **Schedule land use planning meetings** to provide a forum for agencies to meet and discuss future development and to address issues that may surface because of new proposals.
- **Provide copies of this AICUZ study to local, county, tribal, and regional planning departments** and zoning administrators to aid in the planning process and also provide copies of it to appropriate state and federal agencies.

Preparation and presentation of this 2023 AICUZ Study for MacDill AFB is one phase in continuing Air Force participation in the local planning process. The Air Force recognizes that, as the local community updates its land use plans, MacDill AFB must be ready to provide additional input, as needed.

7.2 STATE AND REGIONAL ROLES

As noted in **Section 6.2,** land use planning and zoning in the State of Florida are delegated to municipal and county governments, which are empowered to create comprehensive land use plans and coordinate local land use plans. Recommendations for working with local governments to encourage compatible land use are discussed below, in **Section 7.3.**

HILLSBOROUGH COUNTY CITY-COUNTY PLANNING COMMISSION (PLANNING COMMISSION)

As part of the development of the updated comprehensive plan – Live Grow Thrive 2045: Tampa Comprehensive Plan Update, the Planning Commission should be sure to acknowledge the presence of MacDill AFB and incorporate the findings and recommendations associated with this 2023 AICUZ Study for MacDill AFB. This will allow for proper planning and evaluation of developments in and around the installation and allow for the informed evaluation of rezoning efforts and projects as they arise.

TAMPA BAY DEFENSE ALLIANCE

The Tampa Bay Defense Alliance (TBDA) was created in January 2012 and consists of an eight county region that mirrors the Tampa Bay Partnership. Although the initial impetus for the TBDA was related to MacDill AFB, the TBDA's definition of "defense community" has evolved to include the DoD, the Armed Services, and civilians, but also reserve forces, the Coast Guard, intelligence community, Veteran's Affairs, and some international partners. Overall, the mission of the TBDA is "To Champion Our Defense Community" by facilitating and resolving challenges facing our defense community in collaboration with military, community and industry stakeholders. With this mission, the TBDA is an ideal organization to assist in the cooperative discussion and implementation of measures to promote compatible development around MacDill AFB and not only protect and bolster the local communities, but preserve the operating mission of the installation.

READINESS AND ENVIRONMENTAL PROTECTION INTEGRATION

MacDill AFB could continue to pursue funding sources through existing federal government programs, such as DoD's Readiness and Environmental Protection Integration (REPI) Program, for protection of mission-sensitive areas.

The REPI Program is a key tool used by DoD and its partners to protect the military's ability to train, test, and operate. DoD created the REPI Program in response to the development of lands and loss of habitat in the vicinity of or affecting its installations, ranges, and airspace that can lead to restrictions or costly and inadequate training and testing alternatives. Through REPI, DoD works with state and local governments, conservation organizations, and willing private landowners to address these challenges to the military mission and the viability of DoD installations and ranges. The REPI Program has enjoyed broad bipartisan support both in the U.S. Congress and among groups representing state and local officials.

7.3 LOCAL GOVERNMENT ROLE

The role of the local government is to enact planning, zoning, and development principles and practices that are compatible with the installation and protect the installation's mission.

The residents of the surrounding community have a long history of working with personnel from MacDill AFB. Adoption or incorporation of the following recommendations during potential future revisions of relevant land use planning or zoning regulations will strengthen this relationship, increase the health and safety of the public, and continue to protect the integrity of the installation's flying mission:

- **Local government planners consider AICUZ policies and guidelines when developing or revising city, town, or county comprehensive plans** and use AICUZ overlay maps and Air Force Land Use Compatibility Guidelines (see Appendix A) to evaluate existing and future land use proposals.
- **Modify or update zoning ordinances, as necessary,** to reflect the compatible land uses outlined in this AICUZ study.
- **Ensure that new development applications or properties that are applying for a change of use are submitted to MacDill AFB** to afford the base with an opportunity to assess those applications for potential impacts on defense missions. The MacDill AFB 6th ARW/PA Office can provide a land use planning point of contact.
- **Local governments review their capital improvement plans,** infrastructure investments, and development policies to ensure they do not encourage incompatible land use patterns near MacDill AFB, with particular emphasis on utility extension and transportation planning.
- **Local governments implement or modify height and obstruction ordinances** that would reflect and are consistent with current Air Force and 14 CFR 77 requirements, presented in this study as HAFZs.
- **Fair disclosure ordinances be enacted to require disclosure** to the public for those AICUZ study items that directly relate to military operations at MacDill AFB.
- **Where allowed, local governments require real estate disclosure** for individuals purchasing or leasing property within noise zones, CZs, or APZs.
- **Enact or modify building/residential codes** to ensure that any new construction near MacDill AFB has the recommended noise-level reduction (NLR) measures incorporated into the design and construction of structures.
- **Government planning bodies monitor proposals for tall structures,** such as wind turbines and communication towers, to ensure that new construction does not pose a hazard to navigable airspace around MacDill AFB. Where appropriate, coordinate with the FAA on the height of structures.
- **Local government land use plans** and ordinances reflect AICUZ study recommendations for development in CZs, APZs, and noise zones.
- **Local governments consult with MacDill AFB on planning and zoning actions** that have the potential to affect installation operations.
- **Invite the Air Force leadership to be ex officio members on boards, commissions, and regional councils** addressing long-range development and other planning policies.
- **Encourage the development of a working group of city, county, Planning Commission, and MacDill AFB representatives** to discuss land use concerns and major development proposals that could affect military operations.

7.4 COMMUNITY ROLE

Neighboring residents and installation personnel have a long-established history of working together for the mutual benefit of the MacDill AFB mission and the local community. Adoption of the following recommendations for community stakeholders will strengthen this relationship, protect the health and ensure the safety of the public, and help protect the integrity of the installation's defense mission:

REAL ESTATE PROFESSIONALS AND BROKERS

- Know where noise zones, CZs, or APZs encumber land near the air installation and invite installation representatives to brokers' meetings to discuss the AICUZ Program with real estate professionals.
- Disclose noise impacts to all prospective buyers of properties within areas with noise levels greater than 65 dB DNL or within the CZs or APZs.
- Require the local real estate multiple listing service to disclose noise zones and the location of CZs or APZs for all listings.

DEVELOPERS

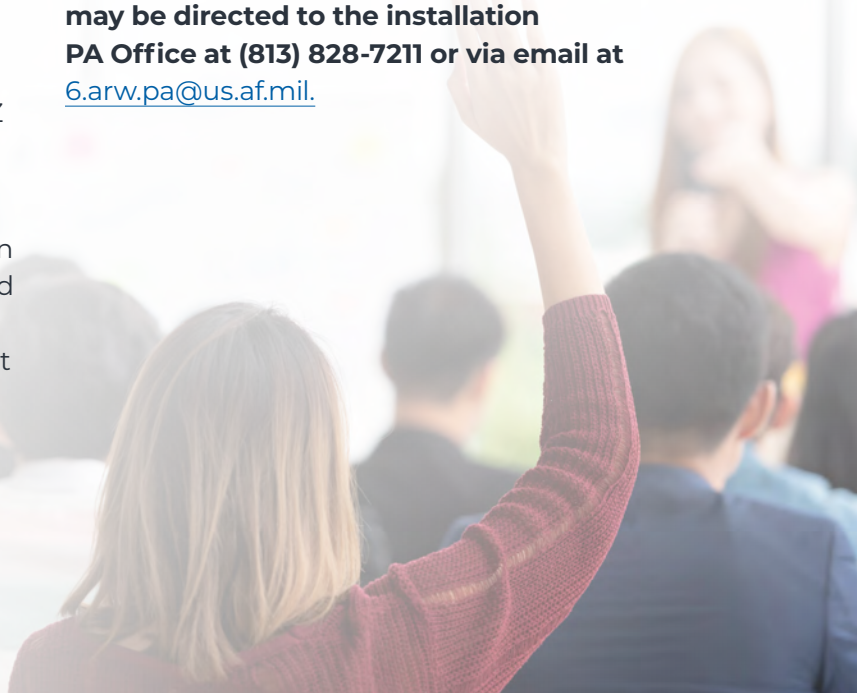
- Know where the noise zones and CZs or APZs encumber land near the air installation. Consult with MacDill AFB on proposed developments within the AICUZ footprint.
- Participate in local discussions regarding existing zoning ordinances and subdivision regulations to support the compatible land uses outlined in this AICUZ study through implementation of a zoning overlay district based on noise contours, CZs, and APZs.

LOCAL CITIZENS

- Participate in local forums with the installation to learn more about the installation's missions.
- Become informed about the AICUZ Program and learn about the program's goals, objectives, and value in protecting the public's health, safety, and welfare.
- When considering property purchases, ask local real estate professionals, city planners, and installation representatives about noise and accident potential.

While the installation and community are separated by a fence, it is recognized that MacDill AFB activities and operations may affect the community. Likewise, community activities and development decisions can affect MacDill AFB's ability to complete its local hometown mission. The local military and community goals can be mutually achieved through a combination of collaborative planning and partnerships, open communication, and close relationships. This AICUZ study can provide a foundation on which related communication can be based to ensure that the community and its hometown military installation can continue to coexist for many years.

Questions about the AICUZ Program may be directed to the installation PA Office at (813) 828-7211 or via email at 6.arw.pa@us.af.mil.

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APPENDIX A

LAND USE COMPATIBILITY TABLES

Table A-1 provides compatibility recommendations based on historical aircraft mishap locations on or near air installations. The primary land use objective is to discourage people-intensive land uses in areas of high accident potential.

While the table uses Standard Land Use Coding Manual (SLUCM) categories for organization, the categories vary from SLUCM as the coding system does not differentiate based on population density. Some land uses warrant additional evaluation due to the variation of densities of people, intensity of use, or other characteristics that could impact safety of flight. Floor Area Ratio (FAR) recommendations are included within the table to guide suggested maximum density for non-residential uses. General notes and specific footnotes at the bottom of the table provide additional information and compatibility considerations.

These recommendations are intended to support compatible land use planning both on and off base; they do not constitute a federal determination that any use of land is acceptable or unacceptable under local zoning.

TABLE A-1

Recommended Land Use Compatibility for Clear Zones and Accident Potential Zones

Land Use Name And SLUCM Category	Clear Zone	APZ-I	APZ-II	Maximum Density
Residential Use Group (SLUCM Category 10)				
Residential Uses, Inclusive of All Residential Units I.e., Any Type of Single or Multiple Dwelling Units.	N	N	Y[1,2]	Maximum density of 2 dwelling units per acre
Mobile Home Parks or Courts	N	N	N	
Transient Lodgings	N	N	N	
Manufacturing Use Group (SLUCM Categories 20 & 30)				
Food and Kindred Products; Textile Mill Products; Manufacturing; Stone, Clay, Glass, Primary Metal and Fabricated Metal Products; Manufacturing	N	N	Y	Max FAR 0.56 in APZ II
Fabric Products; Leather and Similar Materials; Chemicals and Allied Products; Petroleum Refining and Related Industries; Rubber and Miscellaneous Plastic Products; Manufacturing; Precision Manufacturing	N	N	N	
Lumber and Wood Products; Manufacturing Furniture and Fixtures; Paper and Allied Products; Printing, Publishing, and Allied Industries Miscellaneous Manufacturing	N	Y	Y	Maximum FAR of 0.28 in APZ I & 0.56 in APZ II
Transportation, Communication and Utilities Use Group (SLUCM Category 40)				
Rail, Motor Vehicle, Aircraft, Marine etc. Transportation, Highway and Street Right-Of-Way, Automobile Parking, and Utilities, Telephone, Cellular and Radio Communication	N[3]	Y[4]	Y	Maximum FAR of 0.28 in APZ I & 0.56 in APZ II
Solid Waste Disposal, (Landfills, Incinerators, etc.)	N	N	N	
Trade (SLUCM Category 50)				
Wholesale Trade	N	Y	Y	Maximum FAR of 0.28 in APZ I & .56 in APZ II
Retail Trade – Building Materials	N	Y	Y	Maximum FAR of 0.20 in APZ-I and 0.40 in APZ-11;
Retail Trade – Hardware, Paint, and Farm Equipment Stores,	N	Y	Y	Maximum FAR of 0.12 in APZ I and 0.24 in APZ II
Retail Trade – Including Neighborhood Centric Shops	N	N	Y	Maximum FAR of 0.16 in APZ II

Land Use Name And SLUCM Category	Clear Zone	APZ-I	APZ-II	Maximum Density
Mass Retailing, Super Stores, Strip Malls, Shopping Centers,[5] Discount Clubs, Home Improvement Stores, etc.; Eating and Drinking Establishments	N	N	N	
Retail Trade – Food Such as Groceries, Bakeries, Confectionaries, Meat Markets, and Fast Food Establishments	N	N	Y	Maximum FAR of 0.24 in APZ II
Retail Trade – Automotive, Marine Craft, Aircraft, and accessories	N	Y	Y	Maximum FAR of 0.14 in APZ I & 0.28 in APZ II
Retail Trade – Apparel and Accessories, Furniture, Home, Furnishings and Equipment	N	N	Y	Maximum FAR of 0.28 in APZ II
Other Retail Trade	N	N	Y	Maximum FAR of 0.16 in APZ II
Services (SLUCM Category 60)				
Finance, Insurance, Real Estate, Personal, Professional and Miscellaneous Services (Office Uses Only) Services	N	N	Y	Maximum FAR of 0.22 in APZ II
Cemeteries	N	Y[6]	Y[6]	
Warehousing and Storage Services	N	Y	Y	Maximum FAR of 1.0 in APZ I; 2.0 in APZ II
Repair Services and Contract Construction	N	Y	Y	Maximum FAR of 0.11 APZ I; 0.22 in APZ II
Hospitals, Nursing Homes, and Other Medical Facilities; Educational Services, Childcare Services, Child Development Centers, and Nurseries	N	N	N	
Government Services	N	N	Y	Maximum FAR of 0.24 in APZ II
Cultural, Entertainment and Recreational Use Group (SLUCM Category 70)				
Nature Exhibits	N	Y[7]	Y[7]	
Cultural Activities, Auditoriums, Concert Halls, Places of Worship; Outdoor Music Shells, Museums, Outdoor Displays, Amphitheaters, Sports Arenas, Spectator Sports, Resorts and Group Camps, or Other Places of Assembly	N	N	N	
Amusements – Fairgrounds, Miniature Golf, Driving Ranges; Amusement Parks, Etc.	N	N	Y[11]	
Recreational Activities (Including Golf Courses, Riding Stables, Water Recreation), Parks	N	Y[7]	Y[7]	Maximum FAR of 0.11 in APZ I; 0.22 in APZ II
Other Cultural, Entertainment and Recreation	N	Y[6]	Y[6]	

Land Use Name And SLUCM Category	Clear Zone	APZ-I	APZ-II	Maximum Density
Resource Production and Extraction (SLUCM Category 80)				
Agriculture and Livestock Farming, Including Grazing and Feedlots	Y[8]	Y[8]	Y[8]	
Agriculture Related Activities	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Forestry Activities[9]	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Fishing Activities	N[10]	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Mining Activities	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Other Resource Production or Extraction	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Other (SLUCM Category 90)				
Undeveloped Land	Y	Y	Y	
Water Areas	N	N	N	

Key: Land Use Recommendations

Y (Yes) Land use and related structures compatible without restrictions.

N (No) Land use and related structures are not compatible and should be prohibited.

Yx Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.

Nx No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.

Notes: General Notes for All Uses

a. The suggested maximum occupancy for commercial, service, or industrial buildings or structures in APZ I is 25 people per acre, and 50 people per acre in APZ II. Outside events should normally be limited to assemblies of not more than 25 people an acre in APZ I, and maximum assemblies of 50 people an acre in APZ II.

b. Recommended FARs are calculated using standard parking generation rates for various land uses, vehicle occupancy rates, and desired density in APZ I/II. For APZ I, the formula is FAR = 25 people an acre/ (Average Vehicle Occupancy x Average Parking Rate x (43560/1000)). The formula for APZ II is FAR = 50/ (Average Vehicle Occupancy x Average Parking Rate x (43560/1000)).

c. No structures (except airfield lighting and navigational aids necessary for the safe operation of the airfield when there are no other siting options), buildings, or above ground utility and communications lines should normally be located in Clear Zone areas on or off the air installation. The Clear Zone is subject to the most severe restrictions.

d. Safety of flight should be considered when evaluating development that includes explosive potential; generates smoke, steam, am or dust; and steam, creates electronic interference; lighting or glare; poor tall structures.

e. The suggested maximum occupancy for commercial, service, or industrial buildings or structures in APZ I is 25 people per acre, and 50 people per acre in APZ II. Outside events should normally be limited to assemblies of not more than 25 people an acre in APZ I, and maximum assemblies of 50 people an acre in APZ II.

f. Recommended FARs are calculated using standard parking generation rates for various land uses, vehicle occupancy rates, and desired density in APZ I/II. For APZ I, the formula is FAR = 25 people an acre/ (Average Vehicle Occupancy x Average Parking Rate x (43560/1000)). The formula for APZ II is FAR = 50/ (Average Vehicle Occupancy x Average Parking Rate x (43560/1000)).

g. No structures (except airfield lighting and navigational aids necessary for the safe operation of the airfield when there are no other siting options), buildings, or above ground utility and communications lines should normally be located in Clear Zone areas on or off the air installation. The Clear Zone is subject to the most severe restrictions.

h. Safety of flight should be considered when evaluating development that includes explosive potential; generates smoke, steam, am or dust; and steam, creates electronic interference; lighting or glare; poor tall structures.

i. Development of renewable energy resources, including solar and geothermal facilities and wind turbines, may impact military operations through hazards to flight or electromagnetic interference. Each new development should be analyzed for compatibility on a case-by-case basis that considers both the proposal and potentially affected mission.

j. Water features that may attract waterfowl and present bird/wildlife aircraft strike hazards (BASH), or activities that produce dust or light emissions that could affect pilot vision are generally not compatible and should be evaluated on a case-by-case basis.

k. Evaluation of potential land management actions occurring on public and private lands, such as prescribed burns, should identify the hazard (i.e., visual impairment) to aircraft flight safety and to de-conflict operations occurring at the base (i.e., scheduled exercises and training requirements).

l. This compatibility table identifies places of worship as a cultural gathering. However, religious institutions provide a wide variety of services and in these instances refer to the applicable category.

Footnotes Specific to Certain Land Uses

1. The suggested maximum density for detached single-family housing is two dwelling units per acre to encourage retention of farming and open space.

2. Where a parcel is partially located in an APZ II, clustered development is encouraged on the portion outside the APZ while maximizing open space within the APZ.

3. All roads within the Clear Zone are discouraged, but if required, they should not be wider than two lanes and the rights-of-way should be fenced (frangible) and not include sidewalks or bicycle trails. Nothing associated with these roads should violate obstacle clearance criteria.

4. Above ground passenger terminals and above ground power transmission or distribution lines are not recommended. Prohibited power lines include high-voltage transmission lines and distribution lines that provide power to cities, towns, or regional power for unincorporated areas.

5. A shopping center is an integrated group of commercial establishments that is a planned, developed, owned, or managed as a unit. Shopping center types include strip, neighborhood, community, regional, and super-regional facilities anchored by small businesses, a supermarket or drug store, discount retailer, department store, or several department stores, respectively. The maximum recommended FAR should be applied to the gross leasable area of the shopping center.

6. Land uses in the APZs should be passive open space; ancillary places of public assembly are not recommended.

7. Low occupancy facilities are compatible with these uses; however, playgrounds and marinas are not recommended.

8. Activities that attract concentrations of birds creating a hazard to aircraft operations are not compatible.

9. Lumber and timber products removed due to establishment, expansion, or maintenance of Clear Zone lands owned in fee will be disposed of in accordance with applicable DoD guidance.

10. Controlled hunting and fishing may occur for the purpose of wildlife management.

11. Amusement centers, family entertainment centers or amusement parks designed or operated at a scale that could attract or result in concentrations of people, including employees and visitors, greater than 50 people per acre at any given time are incompatible in APZ II run-ups. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

Table A-2 provides compatibility recommendations based on yearly A-weighted Day-Night Average Sound Level (ADNL) [the "A" is implied in DNL when discussing aircraft operations] on and around installations. The primary land use objective is to discourage noise-sensitive land uses in areas of higher noise exposure.

The table is organized based on Standard Land Use Coding Manual (SLUCM) categories; however, the categories used vary from SLUCM as the coding system does not differentiate based on noise sensitivity. Some uses warrant additional evaluation due to potential for annoyance and activity interference. General notes and specific footnotes at the bottom of the table provide additional information and considerations for compatibility determinations.

These recommendations are intended to support compatible land use planning both on and off base; they do not constitute a federal determination that any use of land is acceptable or unacceptable under local zoning.

TABLE A-2

Recommended Land Use Compatibility for Clear Zones and Accident Potential Zones

	A-Weighted Dnl Levels (dB)					
Land Use Name and SLUCM Category	**<65**	**65-70**	**70-75**	**75-80**	**80-85**	**85+**
Residential Use Group (SLUCM Category 10)						
Residential Uses, Inclusive Of All Residential Units (i.e., Any Type of Single or Multiple Dwelling Units)	Y	N[1]	N[1]	N	N	N
Mobile Home Parks or Courts	Y	N	N	N	N	N
Transient Lodgings	Y	N[1]	N[1]	N[1]	N	N
Manufacturing Use Group (SLUCM Categories 20 & 30)						
Manufacturing and Industrial Uses	Y	Y	Y[2]	Y[3]	Y[4]	N
Precision Manufacturing	Y	Y	Y[2]	Y[3]	N	N
Transportation, Communication and Utilities Use Group (SLUCM Category 40)						
Rail, Motor Vehicle, Aircraft, Marine and Other Transportation, and Communication Systems And Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Highway and Street Right-of-Way, Automobile Parking	Y	Y	Y	Y	Y	N
Telephone, Cellular and Radio Communication	Y	Y	Y[2]	Y [3]	N	N
Trade (SLUCM Category 50)						
Wholesale Trade	Y	Y	Y[2]	Y[3]	Y[4]	N
Building Materials, Hardware and Farm Equipment Sales	Y	Y	Y[2]	Y[3]	Y[4]	N
Mass Retailing, Super Stores, Strip Malls, Shopping Centers, Discount Clubs, Home Improvement Stores, Etc., Eating and Drinking Establishments	Y	Y	Y[2]	Y[3]	N	N

	A-Weighted Dnl Levels (dB)					
Land Use Name and SLUCM Category	**<65**	**65-70**	**70-75**	**75-80**	**80-85**	**85+**
Services (SLUCM Category 60)						
Finance, Insurance and Real Estate, Personal, Professional and Miscellaneous Services; Religious Activities	Y	Y	Y[2]	Y[3]	N	N
Cemeteries	Y	Y	Y[2]	Y[3]	Y[4]	Y[5]
Warehousing/Storage and Repair Services	Y	Y	Y[2]	Y[3]	Y[4]	N
Hospitals/Medical, Childcare and Development Services, Educational Facilities	Y	Y[2]	Y[3]	N	N	N
Nursing homes	Y	N[1]	N[1]	N	N	N
Governmental	Y	Y	Y[2]	Y[3]	N	N
Cultural, Entertainment and Recreational Use Group (SLUCM Category 70)						
Cultural Activities, Auditoriums and Concert Halls	Y	Y[2]	Y[3]	N	N	N
Nature Exhibits	Y	Y	N	N	N	N
Public Assembly	Y	Y	N	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N
Outdoor Sports Arenas, Spectator Sports	Y	Y[6]	Y[6]	N	N	N
Amusements	Y	Y	Y	N	N	N
Outdoor Recreational Activities	Y	Y	Y[2]	Y[3]	N	N
Resorts, Camps, Parks and Other C/E/R Activities	Y	Y	Y[2]	N	N	N
Resource Production and Extraction (SLUCM Category 80)						
Agriculture and Forestry	Y	Y[7]	Y[8]	Y[9]	Y[9]	Y[9]
Livestock Farming, Animal Breeding	Y	Y[7]	Y[8]	N	N	N
Fishing, Mining and Other Resource Production or Extraction	Y	Y	Y	Y	Y	Y

Key: Land Use Recommendations

Y (Yes) Land use and related structures compatible without restrictions.

N (No) Land use and related structures are not compatible and should be prohibited.

Yx Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.

Nx No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.

Notes: General Notes for All Uses

a. Compatibility designations in **Table A-2** generally refer to the principal use of the site. If other uses with greater sensitivity to noise are proposed, a determination of compatibility should be based on that use which is most adversely affected by operational noise.

b. When appropriate, noise level reduction (NLR) may be necessary to achieve compatibility. NLR (outdoor to indoor) is achieved through the incorporation of sound attenuation into the design and construction of a structure. Measures to achieve an indoor noise reduction do not necessarily solve noise issues outside the structure and additional evaluation may be warranted. Building location, site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure, particularly from aircraft ground maintenance run-ups. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

c. Land uses below 65db DNL are generally compatible. However, localities, when evaluating the application of these guidelines, should consider possible annoyance tied to land uses that involve predominately outdoor activities, or where quiet is a basis for the use.

d. Land use that involves outdoor activities in areas above 80db DNL are not recommended, but if the community allows such activities, hearing protection devices should be worn when noise sources are present.

Footnotes Specific to Certain Land Uses

1. Residential

a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65-70 and strongly discouraged in DNL 70-75. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones.

b. Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 decibels (dB) in DNL 65-70 and 30 dB in DNL 70-75 should be incorporated into building codes and be considered in individual approvals; for transient housing, an NLR of at least 35 dB should be incorporated in DNL 75-80.

c. Normal permanent construction can be expected to provide an NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year-round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.

2. Measures to achieve NLR of 25 dB 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.

3. Measures to achieve NLR of 30 dB 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.

4. Measures to achieve NLR of 35 dB 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.

5. Buildings where public is received, are not recommended.

6. Land use is compatible provided special sound reinforcement systems are installed.

7. Where residences are permitted, measures to achieve outdoor to indoor NLR of at least 25dB should be incorporated into the design.

8. Where residences are permitted, measures to achieve outdoor to indoor NLR of at least 30dB should be incorporated into the design.

9. Residences are not compatible.


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APPENDIX B

KEY TERMS

Average Annual Day (AAD). The "average annual day" methodology is the EPA-recommended approach to representing noise exposure, which is over a 365-day year.

Average Busy Day (ABD). For many years, the Air Force approximated the "average busy day" concept, which acknowledged that flying at some installations seldom occurred on weekends and that, therefore, annual operations were divided by the number of operational days (e.g., five flying days multiplied by 52 weeks equals 260 operational days).

Day-Night Average Sound Level (DNL). DNL (A-weighted when describing aircraft operational noise) is a composite noise metric accounting for the sound energy of all noise events in a 24-hour period. In order to account for increased human sensitivity to noise at night, DNL includes a 10 dB adjustment to events occurring during the acoustical nighttime period (10:00 p.m. through 7:00 a.m.). See section 4.3 for additional information.

Decibel (dB). The decibel is the unit used to measure the intensity of a sound.

Flight Profiles. Flight profiles consist of aircraft conditions (i.e., altitude, speed, power setting, etc.) defined at various locations along each assigned flight track.

Flight Track. Flight tracks depict the various types of arrivals, departures, and closed patterns accomplished at air installations. The location depicted for each flight track is representative for the specific track and may vary due to ATC, weather, and other reasons (e.g., one pilot may fly on one side of the depicted track, while another pilot may fly slightly to the other side of the track).

Operation. An aircraft operation is defined as one takeoff or one landing. A complete closed pattern or circuit is counted as two operations because it has a takeoff component and a landing component. A sortie is a single military aircraft flight from the initial takeoff through the termination landing. The minimum number of aircraft operations for one sortie is two operations, one takeoff (departure) and one landing (approach).


C

APPENDIX C

LAND USE AND ZONING COMPARISON

Appendix C contains the existing land use, zoning, and future land use categories for the City of Tampa and the Planning Commission surrounding MacDill AFB, and these were the primary source of the land use compatibility analysis.

TABLE C-1

Existing Land Use, Zoning, and Future Land Use for City of Tampa Normalized to AICUZ Land Use Categories

Land Use/Zoning Category	AICUZ Land Use Category
Existing Land Use	
Agricultural	Open/Agriculture/Low Density
Group Homes	Residential
Heavy Commercial	Commercial
Heavy Industrial	Industrial
Homeowner Association/Common Property	Residential
Light Commercial	Commercial
Light Industrial	Industrial
Mobile Home Park	Residential
Multi-Family	Residential
Public/Quasi-Public/Institutions	Public/Quasi-Public
Public Communications Utilities	Transportation/Communication/Utility
Right of Way/Roads/Highways	Transportation/Communication/Utility
Single-Family/Mobile Home	Residential
Two-Family	Residential
Unknown	Undeveloped
Vacant	Undeveloped
Zoning	
Commercial General	Commercial

Land Use/Zoning Category	AICUZ Land Use Category
Commercial Intensive	Commercial
Commercial Neighborhood	Commercial
Industrial General	Industrial
Industrial Heavy	Industrial
Planned Development	Residential
Planned Development Alternative	Residential
Residential Multi-Family	Residential
Residential Office	Residential
Residential Single-Family	Residential
Future Land Use	
Community Commercial-35 (2.0 FAR)	Commercial
Community Mixed Use-35 (2.0 FAR)	Residential
Heavy Industrial (1.5 FAR)	Industrial
Light Industrial (1.5 FAR)	Industrial
Major Environmentally Sensitive Areas	Open/Agriculture/Low Density
Public/Semi-Public	Public/Quasi-Public
Recreational/Open Space	Open/Agriculture/Low Density
Residential-10 (.35 FAR)	Residential
Residential-20 (.50 FAR)	Residential
Residential-35 (.60 FAR)	Residential
Residential-50 (1.0 FAR)	Residential
Transitional USE-24 (1.5 FAR)	Residential
Urban Mixed Use-60 (3.25 FAR)	Residential

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