### San Antonio International Airport Strategic Development Plan

### 2021 AIRPORT MASTER PLAN

#### **CHAPTER 2 – INVENTORY OF EXISTING CONDITIONS**

**JUNE 2021** 







### **Table of Contents**

2	INVENT	2-1				
	2.1 Bac	2.1 Background				
	2.1.1	Airport History and Recent Development				
	2.1.2	Previous Studies	2-5			
	2.1.3	Airport Location	2-6			
	2.1.4	Airport Setting	2-9			
	2.1.5	Airport Management	2-12			
	2.1.6	Airport Role	2-12			
	2.2 Airf	ield Facilities	2-12			
	2.2.1	Runways	2-13			
	2.2.2	Taxiways	2-16			
	2.2.3	Movement Areas	2-19			
	2.2.4	Hot Spots	2-21			
	2.2.5	Weather Information Sources	2-21			
	2.3 Airs	pace Operations	2-22			
	2.3.1	Airspace Classes	2-22			
	2.3.2	Instrument Approach Procedures	2-25			
	2.3.3	Air Traffic Control Facilities	2-29			
	2.3.4	Small Unmanned Aerial Systems	2-30			
	2.4 Pas	senger Terminal Facilities	2-32			
	2.4.1	Terminal A Facilities	2-33			
	2.4.2	Terminal B Facilities	2-41			
	2.4.3	Remote/Remain Overnight Parking Positions	2-42			
	2.4.4	Federal Inspection Service Facilities	2-44			
	2.4.5	Terminal Observations	2-44			
	2.4.6	Terminal Curbsides	2-44			
	2.5 Air	Cargo Facilities	2-49			





	2.5.1	Integrator Cargo Facilities	.2-49
	2.5.2	Belly Cargo Facilities	.2-50
2.0	6 Gen	eral Aviation Facilities	2-51
	2.6.1	Fixed Base Operators	.2-51
	2.6.2	Corporate and General Aviation Operators	.2-53
	2.6.3	General Aviation Customs Facility	.2-55
2.7	7 Avia	tion Support Facilities	2-56
	2.7.1	Airport Administration Facilities	.2-56
	2.7.2	Airport Operations Facilities	.2-57
	2.7.3	Airport Police and Security Facilities	.2-58
	2.7.4	Airport Maintenance Facilities	.2-59
	2.7.5	Aircraft Rescue and Fire Fighting Facilities	.2-60
	2.7.6	Fuel Storage Facilities	.2-60
	2.7.7	Aircraft Maintenance, Repair and Overhaul Facilities	.2-62
	2.7.8	Federal Aviation Administration Facilities	.2-64
	2.7.9	Airline Catering Facilities	.2-65
	2.7.10	Ground Support Equipment Staging, Storage and Maintenance Faciliti 66	es .2-
	2.7.11	Electrical Vault	.2-66
	2.7.12	Waste Disposal Facilities	.2-67
	2.7.13	Central Heating and Refrigeration Plant	.2-68
	2.7.14	Ground Runup Enclosure	.2-68
	2.7.15	Compass Rose	.2-69
	2.7.16	Isolation Pad	.2-70
	2.7.17	Airport Perimeter Fence and Security Gates	.2-70
	2.7.18	Vacant Facilities	.2-71
2.8	3 Land	dside Facilities	2-72
	2.8.1	Airport Roadway Access	.2-72
	2.8.2	Off-Airport and Regional Access Facilities and Plans	.2-87
	2.8.3	Transit	.2-91





	2.8.4	Automobile Parking	2-92
	2.8.5	Rental Car Facilities	2-98
2.9	9 Oth	er Facilities	2-99
	2.9.1	Other Aeronautical Facilities	2-100
	2.9.2	Nonaeronautical Facilities	2-101
2.	10 Mete	eorological Data	2-101
	2.10.1	Temperature Analysis	2-101
	2.10.2	Wind Analysis	2-101
	2.10.3	Weather Conditions	2-103
2.	11 Env	ironmental Inventory	2-103
	2.11.1	Air Quality	2-106
	2.11.2	Aquatic Resources	2-107
	2.11.3	Hazardous Materials	2-108
	2.11.4	Pollution Prevention	2-109
	2.11.5	Wildlife Hazard Assessment and Wildlife Hazard MGMT Plan	2-109
	2.11.6	Threatened and Endangered Species	2-110
	2.11.7	Socioeconomic Conditions and Demographics	2-112
	2.11.8	Community Resources	2-113
	2.11.9	Cultural Resources	2-114
	2.11.1	0 Section 4(f) Properties	2-115
	2.11.1	1 Chapter 26 Properties	2-116
	2.11.1	2 Noise Sensitive Land Uses/Receptors	2-116
2.	12 Utili	ty and Drainage Inventory	2-117
	2.12.1	Water and Sanitary Sewer	2-118
	2.12.2	Electricity	2-120
	2.12.3	Communications	2-123
	2.12.4	Gas	2-126
	2.12.5	Federal Aviation Administration Ductbank	2-126
	2 12 6	Drainage Inventory	2-120



2.13 Vi	cinity Land Use and Controls	2-140
2.13	.1 On-Airport Land Uses	2-140
2.13	.2 Runway Protection Zones	2-142
2.13	.3 Land Zoning	2-143
2.14 Re	cycling Plan	2-145
2.15 Fir	nancial Inventory	2-145
Appendix 2A	Existing Airport Facilities	
Appendix 2B	Runway 31L End Comparative Safety Risk Assessmen	nt
Appendix 2C	Air Traffic Control Arrival procedures by Runway	
Appendix 2 D	Roadway Vehicular Traffic Counts	
Appendix 2E	Wind Roses	
Appendix 2F	Environmental Inventory Technical Report	
Appendix 2G	Recycling Plan	
Appendix 2H	Financial Inventory	
List of Figure	S	
Figure 2.1-1: San	Antonio Municipal Airport (1953)	2-2
Figure 2.1-2: Histo	orical Changes	2-3
Figure 2.1-3: Dire	ct Air Service	2-5
Figure 2.1-4: Loca	ation Map and Neighboring Airports	2-7
Figure 2.1-5: Com	npetitor Commercial Service Airports in Texas	2-8
Figure 2.1-6: Airp	ort Diagram	2-10
Figure 2.1-7: Airp	ort Property Boundary	2-11
Figure 2.2-1: Exis	ting Airfield Infrastructure	2-14
Figure 2.2-2: Taxi	iway Width and Design Group	2-17
Figure 2 2-3. Airfi	eld Movement Areas	2-20

## **2021 San Antonio International Airport Master Plan** Inventory of Existing Conditions



Figure 2.2-4: Hot Spots 1 and 2	2-21
Figure 2.3-1: Airspace Classes	2-22
Figure 2.3-2: San Antonio International Airport Class C Airspace	2-24
Figure 2.3-3: Military Operations and Alert Areas in the San Antonio Region	2-26
Figure 2.3-4: Arrival and Departure Procedures	2-29
Figure 2.3-5: Maximum Flight Altitude for Unmanned Aerial Systems	2-31
Figure 2.4-1: Commercial Passenger Terminal Facilities	2-32
Figure 2.4-2: Terminals A and B - Arrivals Level Floor Plan	2-34
Figure 2.4-3: Terminals A and B - Arrivals Level Space Allocation by Airport Funda5	ction . 2-
Figure 2.4-4: Terminals A and B - Arrivals Level Space Allocation by Stakeholde	r 2-36
Figure 2.4-5: Terminals A and B – Departures Level Floor Plan	2-37
Figure 2.4-6: Terminals A and B – Departures Level Space Allocation by Airport F	
Figure 2.4-7: Terminals A and B - Departures Level Space Allocation by Stakeho	older2-
Figure 2.4-8: Terminals A and B Gates	2-41
Figure 2.4-9: Remote/Remain Overnight Aircraft Parking Positions	2-43
Figure 2.4-10: Terminal A Departures Curbside	2-45
Figure 2.4-11: Terminal B Departures Curbside	2-46
Figure 2.4-12: Arrivals Curbside Layout	2-47
Figure 2.4-13: Outer Arrivals Curbside – Taxis and Transportation Network Cor	
Figure 2.4-14: Outer Arrivals Curbside – Transportation Network Companies, Shuttles and Buses	_
Figure 2.5-1: East Cargo Facilities	2-49
Figure 2.5-2: West Cargo Building	2-50
Figure 2.6-1: Fixed-Base Operator Facilities	2-52
Figure 2.6-2: Corporate and General Aviation Operators	2-54





Figure 2.6-3: General Aviation Customs Facility	2-56
Figure 2.7-1: Airport Administration and Operations Facilities	. 2-57
Figure 2.7-2: Airport Integrated Control Center	2-58
Figure 2.7-3: Airport Police and Security Facilities	. 2-58
Figure 2.7-4: Airport Maintenance Facilities	2-59
Figure 2.7-5: Aircraft Rescue and Firefighting	2-60
Figure 2.7-6: Primary Fuel Facility Location	. 2-61
Figure 2.7-7: Aircraft Maintenance, Repair and Overhaul Facilities	. 2-63
Figure 2.7-8: Air Traffic Control Tower	. 2-64
Figure 2.7-9: Remote Transmitter/Receiver Antennas	. 2-65
Figure 2.7-10: Ground Support Equipment Maintenance and Storage Facilities	. 2-66
Figure 2.7-11: Electrical Vault	. 2-67
Figure 2.7-12: Waste Disposal Facilities	. 2-67
Figure 2.7-13: Central Heating and Refrigeration Plant	.2-68
Figure 2.7-14: Run-Up Engine Facility	. 2-69
Figure 2.7-15: Compass Rose	. 2-69
Figure 2.7-16: Isolation Pad	. 2-70
Figure 2.7-17: Vacant Facilities	. 2-72
Figure 2.8-1: Traffic Count Locations by Type	. 2-78
Figure 2.8-2: 24-Hour Traffic Counts by Location	. 2-79
Figure 2.8-3: Area Crashes by Severity of Injury – 2016 Crash Data	. 2-81
Figure 2.8-4: Area Roadway Congestion in 2015 (Volume-to-Capacity Ratio)	. 2-88
Figure 2.8-5: Area Roadway Congestion in 2040 (Volume-to-Capacity Ratio)	. 2-89
Figure 2.8-6: City of San Antonio Thoroughfare Plan	. 2-90
Figure 2.8-7: VIA Vision 2040 Plan	. 2-91
Figure 2.8-8: Airport Area Parking Supply	. 2-93
Figure 2.8-9: Passenger Parking Occupancy from June 8 to June 15	2-96

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



Figure 2.8-10: Employee Parking (Purple Lot) Occupancy from June 8 to June 152-	97
Figure 2.8-11: Rental Car Facilities2-	99
Figure 2.9-1: Other Aeronautical and Nonaeronautical Facilities2-1	00
Figure 2.11-1: Boundaries of the Study Area2-1	04
Figure 2.11-2: Water Resources of the Study Area2-1	80
Figure 2.11-3: Municipal Solid Waste Facilities near the Study Area2-1	10
Figure 2.11-4: Karst Zones of the Study Area2-1	11
Figure 2.11-5: Minority Populations of the Study Area2-1	13
Figure 2.11-6: Community Resources in the Vicinity of the Study Area2-1	14
Figure 2.11-7: Potential Archaeological Liability Map of the Study Area2-1	16
Figure 2.11-8: Future 2019 Noise Sensitive Land Uses/Receptors2-1	17
Figure 2.12-1: Water Utilities	19
Figure 2.12-2: Underground Sewer Utilities	21
Figure 2.12-3: Electrical Utilities2-1	22
Figure 2.12-4: Communications Utilities (Charter Communications)2-1	24
Figure 2.12-5: Communications Utilities (Grande Communications)2-1	25
Figure 2.12-6: Natural Gas Utilities	27
Figure 2.12-7: Federal Aviation Administration Duct Banks	28
Figure 2.12-8: Drainage Airport Location Map2-1	30
Figure 2.12-9: Drainage Airport USGS Map2-1	31
Figure 2.12-10: Flood Insurance Rate Map 48029C0265G2-1	33
Figure 2.12-11: Airside Storm Sewer Map2-1	37
Figure 2.12-12: Salado Creek at Jones Maltsberger Road - July 9, 2018 Rain Event 138	2-
Figure 2.12-13: Salado Creek at E. Bitters Road - July 9, 2018 Rain Event2-1	38
Figure 2.12-14: Salado Creek at Wetmore Road - July 9, 2018 Rain Event2-1	39
Figure 2.12-15: Runoff entering drainage basin near Skyplace Boulevard - July 9, 20 Rain Event	





Figure 2.12-16: Drainage basin outlet near Skyplace Boulevard - July 9, 2018		
Figure 2.13-1: On-Airport Land Uses		
Figure 2.13-2: Runway Protection Zones	2-143	
Figure 2.13-3: Zoning of San Antonio International Airport and Vicinity	2-146	



### List of Tables

Table 2.1-1: Top 10 Busiest Domestic Routes	2-4
Table 2.2-1: Runways Characteristics	2-15
Table 2.2-2: Taxiway Separations and Compliance with Design Standards	2-18
Table 2.3-1: Class G Requirements for Aircraft Operating under Visual Flight Ru	les 2-23
Table 2.3-2: Instrument Approach Procedures	2-27
Table 2.7-1: Primary Fuel Storage Tanks	2-62
Table 2.7-2: Primary Fuel Tanker Trucks	2-62
Table 2.8-1: Airport Area Roadways	2-76
Table 2.8-2: Level of Service Criteria for Intersection Lane Groups	2-82
Table 2.8-3: Level of Service Criteria for Signalized Intersections (May/June 201	8) . 2-83
Table 2.8-4: Level of Service Criteria for Unsignalized Intersections	2-84
Table 2.8-5: Cut-through Traffic Routes and Total Volumes	2-86
Table 2.8-6: On-site and Off-site Inventory of Parking Supply	2-94
Table 2.8-7: Daily Passenger Parking Utilization Summary	2-95
Table 2.8-8: Daily Taxicab (Orange Lot) Parking Utilization Summary	2-97
Table 2.8-9: Rideshare and Cell Phone Lot Utilization Summary	2-98
Table 2.10-1: Allowable Crosswind Component Based on Runway Design Code	2-102
Table 2.10-2: Wind Coverage for Runways 13R-31L and 13L-31R	2-103
Table 2.11-1: Environmental Constraints of the Study Area	2-105
Table 2.11-2: Hazardous Materials Regulatory Database Summary within 0.5-M Study Area	
Table 2.13-1: Existing Airport Land Use	2-142



# 2 INVENTORY CONDITIONS

OF

### **EXISTING**

The Inventory of Existing Conditions chapter describes the current physical, operational, and functional characteristics of SAT and its vicinity. The chapter includes the following sections:

- Background
- Airfield Facilities
- Airspace Operations
- Passenger Terminal Facilities
- Air Cargo Facilities
- General Aviation Facilities
- Aviation Support Facilities
- Landside Facilities
- Meteorological Data
- Environmental Inventory
- Utility and Drainage Inventory
- Vicinity Land Use and Controls
- Recycling Plan
- Financial Inventory

#### 2.1 BACKGROUND

This section provides an overview of the Airport development, location, management structure and role.

#### 2.1.1 AIRPORT HISTORY AND RECENT DEVELOPMENT

The first aviation facility built on the current site of SAT was commissioned in 1941 after the CoSA purchased 1,200 acres of undeveloped land, approximately eight miles north of Downtown CoSA. Originally intended to accommodate civilian activity, the San Antonio Municipal Airport was developed as Alamo Airfield for the U.S Army Air Forces during World War II. The airfield was returned to the city at the end of the war.

In 1944, upon receiving international status, San Antonio Municipal Airport was renamed San Antonio International Airport. In 1953, a new terminal (later named Terminal 2) and the FAA Air Traffic Control Tower (ATCT) were completed, as depicted on **Figure 2.1-1**.



Terminal 2 underwent several modifications in the subsequent years, including two extensions (east and west) completed in 1959, and a concourse with eight gates equipped with jet bridges in 1968, in anticipation of the World's Fair held in San Antonio that year.

Figure 2.1-1: San Antonio Municipal Airport (1953)



Source: Texas Transportation Museum, 1953.

In 1968, CoSA accepted the first Airport Master Plan (AMP) for the planned development of the facility through year 2000. The study recommended the addition of a new 360,000-square-foot terminal, and a new three-level, 1,300-square-foot parking garage. The AMP led to the construction of Terminal 1, commissioned in 1984 and now known as Terminal A, which increased the number of gates to 28.

In 1986, a new ATCT was built to the southwest of the terminal area. Also, for the first time, the number of annual passengers exceeded two million. Further expansions were undertaken over the years. A new \$33 million long-term parking garage was built in 1999 and expanded to 9,000 parking spaces in 2008. In 2001, the opening of the U.S. Highway 281 North Connector road allowed a direct access from U.S. Highway 281 North to the terminals and parking garage. The reconstruction of Terminal 2 (now known as Terminal B) was proposed in the 1998 master plan and completed in 2010. With this reconfigured terminal facility, the number of gates grew to 35. A Consolidated Rental Car Facility (CONRAC) was completed in 2017 along the terminal curbside.

**Figure 2.1-2** depicts the major changes at SAT over the years. Figures in **Appendix 2A** provide an overview of Airport facilities by building number and tenant name or functional use.



Figure 2.1-2: Historical Changes

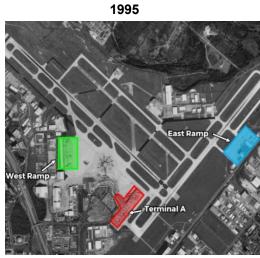
1949 1966 1973













Sources: Texas Transportation Museum and United State Geological Survey; WSP USA, Annotations, 2018.

### 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



The FAA's National Plan of Integrated Airport Systems (NPIAS) 2017-2021 categorizes SAT as a medium hub airport. As of June 2018, 11 airlines offered 54 nonstop destinations, including six international routes to Mexico and Canada. Those flights are operated by Aeroméxico, Air Canada, American Airlines, Alaska Airlines, Allegiant Air, Delta Air Lines, Frontier Airlines, Interjet, Southwest Airlines, United Airlines, and Volaris Airlines. SAT is also a base for three major air cargo airlines: DHL, FedEx, and UPS. **Table 2.1-1** presents the top 10 domestic routes from SAT, and **Figure 2.1-3** depicts the 54 non-stop destinations offered.

Table 2.1-1: Top 10 Busiest Domestic Routes

RANK	AIRPORT	ANNUAL PASSENGERS	CARRIERS
1	Dallas-Fort Worth International Airport (DFW) - Dallas, Texas	506,800	American Airlines
2	Hartsfield-Jackson Atlanta International Airport (ATL) - Atlanta, Georgia	445,990	Delta Air Lines Southwest Airlines
3	Dallas Love Field (DAL) - Dallas, Texas	319,660	Southwest Airlines
4	George Bush Intercontinental/Houston Airport (IAH) – Houston, Texas	297,530	United Airlines
5	Phoenix Sky Harbor International Airport (PHX) - Phoenix, Arizona	258,560	American Airlines Southwest Airlines
6	Denver International Airport (DEN) - Denver, Colorado	244,970	Southwest Airlines United Airlines
7	Mc Carran International Airport (LAS) - Las Vegas, Nevada	212,230	Southwest Airlines
8	Los Angeles International Airport (LAX) – Los Angeles, California	196,210	American Airlines Delta Air Lines Southwest Airlines United Airlines
9	Chicago O'Hare International Airport (ORD) – Chicago, Illinois	182,640	American Airlines United Airlines
10	William P. Hobby Airport (HOU) – Houston, Texas	180,020	Southwest Airlines

Source: Bureau of Transportation Statistics, April 2017 to March 2018.



Figure 2.1-3: Direct Air Service



Source: San Antonio International Airport, June 2018.

#### 2.1.2 PREVIOUS STUDIES

- In 1975, the first AMP was completed to prepare the future of SAT through the 2000 horizon. This
  AMP led to the construction of a new terminal building then designated Terminal 1 and now
  Terminal A.
- In 1998, a new master planning effort was conducted. The main recommendations of the study were as follows:
  - Reconstruction and extension of the two primary runways, and construction of new runway exit taxiways
  - Reconstruction of Terminal 2 (rebranded Terminal B) for a total of 46 gates
  - Additional terminal area to the west, with new curbside front and access roads
  - Development of general aviation (GA) facilities on the north side of the airfield, and relocation of existing tenants
  - Development of cargo facilities adjacent to the East Cargo Complex along Wetmore Road

### 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



- In 2009, an update to the ALP was prepared by Ricondo & Associates, Inc.
- The most recent AMP was released in 2010 (Vision 2050). The main developments proposed in the document were:
  - Extensions of Runway 4-22 and Runway 13R-31L
  - Reconstruction and extension of Runway 13L-31R
  - Additional space for the passenger security screening checkpoint and baggage claim area
  - Expansion of Terminal A
  - Construction of a CONRAC
  - Construction of a new cargo apron
- In 2017, the ALP set was updated by AECOM.
- In January 2018, a "refresh" of the airport's Information Technology (IT) Master Plan was produced by XIP Consulting, LLC.

#### 2.1.3 AIRPORT LOCATION

SAT is located eight miles north of Downtown San Antonio and is adjacent to two highways: U.S. 281 to the east and Interstate 410 to the south. The nearest public and military aviation facilities around SAT are:

- Stinson Municipal Airport (SSF), which is a regional reliever airport per the 2017-2021 NPIAS, is located approximatively 13 miles south of SAT. SSF is part of the SAAS and is operated by the CoSA Aviation Department.
- Randolph Air Force Base (RND), which is located 12 miles east of SAT and is part of the Joint Base San Antonio (JBSA). RND is home of the 12<sup>th</sup> Flying Training Wing, performing about 300,000 aircraft movements annually, as well as various support groups (902<sup>nd</sup> Mission Support Group, 359<sup>th</sup> Medical Group, Air Force Personnel Center, Air Force Office of Special Investigations [AFOSI] Region 4, etc.).
- Port San Antonio (SKF), which was formerly known as Kelly AFB, is located 12 miles southeast of SAT. As part of the 1995 Base Realignment and Closure (BRAC) initiative, Kelly AFB was closed. The facility became Kelly Airfield Annex, as part of JBSA-Lackland Base. Following this transfer, the public entity Port San Antonio was created to redevelop most of the aviation facility into a multimodal logistics center and industrial airport. The airport is categorized as a general aviation facility per the 2017-2021 NPIAS.
- Martindale Army Air Field (MDA), which is a helicopter training facility primarily used by the 36<sup>th</sup>
  Combat Aviation Brigade of the Texas Army National Guard. The heliport is located along the
  Interstates 10 and 410.

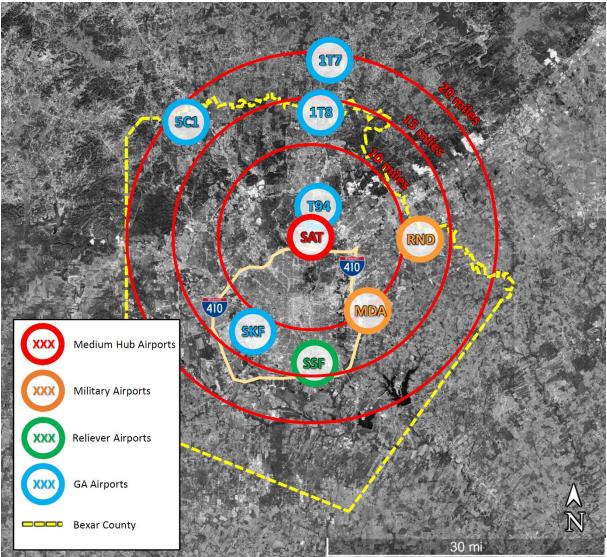
Figure 2.1-4 depicts the airports located within a 20-nautical mile radius of SAT; they are:

Seven public general aviation airfields: Port San Antonio (SKF), Kestrel (1T7), Bulverde (1T8), Twin-Oaks (T94), Horizon (74R), San Geronimo (8T8), and Boerne Stage Field (5C1).

Two military aviation facilities: Randolph Air Force Base (RND) and Martindale Army Air Field (MDA).



Figure 2.1-4: Location Map and Neighboring Airports

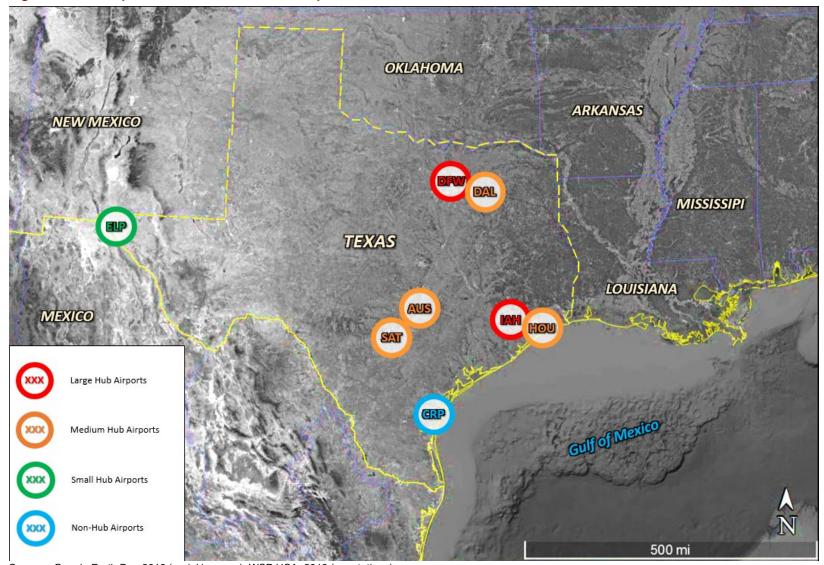


Sources: Google Earth Pro, 2018 (aerial imagery); WSP USA, 2018 (annotations).

The location of SAT's closest competitor commercial airports, such as Austin-Bergstrom International Airport (AUS), George Bush-Intercontinental/Houston Airport (IAH), and Dallas-Fort Worth International Airport (DFW), is depicted on **Figure 2.1-5**.



Figure 2.1-5: Competitor Commercial Service Airports in Texas



Sources: Google Earth Pro, 2018 (aerial imagery); WSP USA, 2018 (annotations).



#### 2.1.4 AIRPORT SETTING

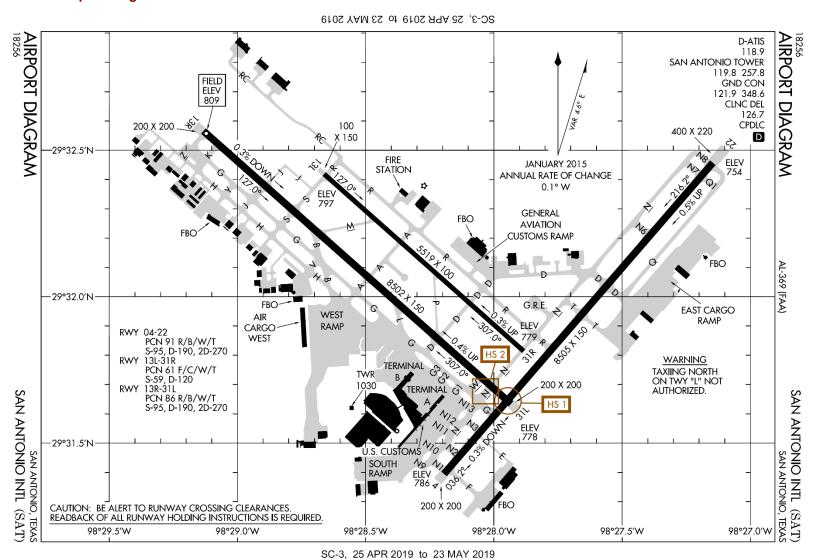
SAT serves the air trade area of San Antonio – New Braunfels Metropolitan Statistical Area (MSA). The airport property consists of 2,600 acres and has not changed since the AMP of 2010. **Figure 2.1-6** depicts the main facilities on Airport property:

- Passenger Terminals: Terminals A and B are located on the south side of the airport.
- Cargo facilities:
  - The main cargo area is located on the southeast side of the airfield, off Wetmore Road.
  - Another cargo area is located on John Saunders Road, north of the passenger terminal facility.
     This building is mainly used by belly cargo shippers (e.g. WFS) and airlines (e.g. Southwest Airlines).
- Maintenance, Repair and Operations (MRO)
- Fixed-Based Operators (FBO) and private hangars surround the airport on the southwest, northeast and southeast sides.
- Aprons: the main aprons at SAT are:
  - West Ramp
  - South Ramp
  - East Cargo Ramp
  - General Aviation Customs Ramp (also referred to as the North Ramp)

**Figure 2.1-7** depicts the Airport property boundary. The airport is surrounded by commercial, industrial, and residential land use areas. It is wedged between two major highways: U.S. Highway 281 to the west and Interstate 410 to the south. Wetmore Road provides access to the eastern side of the airport, and the NE Entrance Road serves the General Aviation Customs Ramp.



Figure 2.1-6: Airport Diagram



Source: Federal Aviation Administration, Aeronautical Information Portal, https://nfdc.faa.gov/nfdcApps/, accessed May 2019.



**Figure 2.1-7: Airport Property Boundary** 



Sources: Google Earth Pro, 2018 (aerial imagery); WSP USA, 2018 (annotations).



#### 2.1.5 AIRPORT MANAGEMENT

SAT is owned and operated by the CoSA and is part of the SAAS. The Aviation Director is appointed by the CoSA to provide leadership for both SAT and SSF. The airport organization manages the day-to-day operation of the Airport, as well as short- and long-range planning, security, maintenance and construction.

#### 2.1.6 AIRPORT ROLE

Per the U.S. Census Bureau, San Antonio is the seventh largest city in the U.S., with a population increase of over 24,000 people in 2017. The economy of the San Antonio – New Braunfels MSA has been growing over the past years. The median household income has increased 5.3 percent since 2014, to reach approximately \$56,000 per the Census American Community Survey 1-year survey in 2017. San Antonio is a well-known "Military City", home of several large military bases such as Fort Sam Houston Army Base, Lackland Air Force Base, Randolph Air Force Base, and Joint Base San Antonio (JBSA), the largest base organization in the U.S. Department of Defense (DoD).

#### NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS

The NPIAS, a plan prepared by the FAA every two years to determine the eligibility of airports to receive federal grants under the Airport Improvement Program (AIP) for the next five years, considered SAT as a medium hub.

Medium hubs enplane between 0.25 percent and 1 percent of total U.S. passenger enplanements, and usually have sufficient capacity to accommodate air carrier operations and a substantial amount of general aviation activity. Per the 2017-2021 NPIAS Report, there are 31 medium hubs in the U.S., which account for 15 percent of total U.S. enplanements.

#### TEXAS AIRPORT SYSTEM PLAN

In 2010, the Texas Department of Transportation published the Texas Airport System Plan (TASP), which identified six airport classifications: Commercial Service Airports, Reliever Airports, Business/Corporate Airports, Community Service Airports, Basic Service Airports and Heliports.

SAT is classified as a Commercial Service Airport, more precisely as a Primary Commercial Service Airport. TASP identified 26 Primary Commercial Airports, which enplanes at least 10,000 annual passengers. These airports are served by both major national and regional airlines, as well as business jets. The program provides funding for improvement needs that the FAA does not fund. Most of the financial assistance from the TASP is distributed to seven airports, including SAT, which account for a total of 92.4 percent of Texas's enplanements.

The improvements identified in the TASP are mainly related to increasing airport capacity, such as automobile parking, terminal buildings, fuel systems, and hangars for general aviation aircraft.

#### 2.2 AIRFIELD FACILITIES

Airfield facilities include runways, taxiways, navigational aids (NAVAIDS) and airfield lighting. **Figure 2.2-1** depicts the airfield infrastructure.

### 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



The Airport Reference Point (ARP) is located at 29° 32' 02.2488" N and 98° 28' 08.6045" W, and the Airport is at an elevation of 809.1 feet above mean sea level (AMSL).

#### 2.2.1 RUNWAYS

The Airport has three runways, two of which are parallel and oriented northwest-southeast, and one crosswind runway oriented southwest-northeast. The separation between the parallel runways is 990 feet. The details of each runway are discussed below and are summarized in **Table 2.2-1.** 

#### **RUNWAY 13R-31L**

Runway 13R-31L is the primary runway at SAT. It is 8,502 feet long and 150 feet wide. The Runway Design Code (RDC) for Runway 13R-31L is D-IV. Runway 13R-31L is equipped with Instrument Landing System (ILS) on both ends, including an ILS category (CAT) II at the Runway 13R end, distance measuring equipment (DME), and precision approach path indicator (PAPI) on each end. Runway 13R-31L has precision instrument runway markings on both ends. Runway 13R-31L is equipped with runway centerline lights (RCL) and high intensity runway lights (HIRL). Runway 13R has a high intensity approach lighting system with sequenced flashing lights category II (ASLF-II) and touchdown zone lights (TDZL), and Runway 31L has a medium intensity approach lighting system with runway alignment indicator lights (MASLR).

There is a 200-foot by 200-foot blast pad on each end of the runway. The grooved, concrete pavement is in good condition. The runway pavement classification number (PCN) is 86/R/B/W/T, and the runway gradient is 0.4 percent positive toward the northwest. Both Runways 13R and 31L have a left traffic pattern.

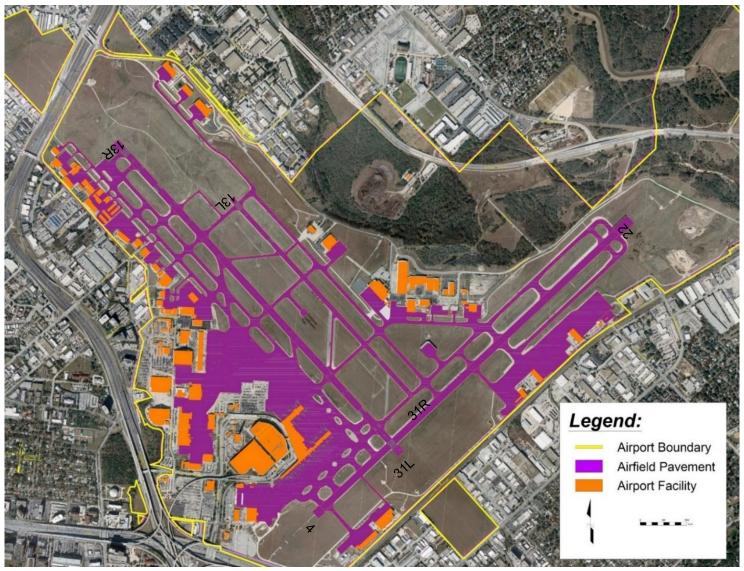
#### **RUNWAY 13L-31R**

Runway 13L-31R is 5,519 feet long and 100 feet wide, and mainly accommodates general aviation aircraft. Runway 13L-31R has an RDC of B-III. This runway has non-precision instrument markings on the Runway 13L end, and basic markings on the Runway 31R end. Runway 13L-31R is equipped with runway end identifier lights (REIL) and medium intensity runway lights (MIRL).

The Runway 13L end has a 150-foot by 100-foot blast pad. It is an asphalt runway in fair condition. The runway PCN is 61/F/C/W/T. The runway gradient is 0.4 percent positive toward the northwest. Runway 13L-31R is equipped with PAPIs at both ends. Both runway ends have a left traffic pattern.



Figure 2.2-1: Existing Airfield Infrastructure



Sources: Google Earth Pro, 2018 (aerial imagery); WSP USA, 2018 (annotations).



#### **Table 2.2-1: Runways Characteristics**

	RUNWAY 13R-31L RUNWAY 13L-31R		RUNWAY 4-22			
		Runv	vay			
Length	8,50	)2 ft.	5,519 ft.		8,505 ft.	
Width	150	Oft.	100	Oft.	150 ft.	
Runway Design Code	D-	·IV	B-	-111	D-	IV
Runway Marking	Pred	ision		-precision Basic	Precision	
Pavement	Concrete -	– Grooved	Asphal	t – Fair	Concrete -	- Grooved
Pavement Classification Number	86/R/	B/W/T	61/F/0	C/W/T	91/R/I	3/W/T
		Pavement	Strength			
Single Wheel	95,00	00 lbs.	59,00	00 lbs.	95,00	0 lbs.
Dual Wheel	190,0	00 lbs.	120,00	00 lbs.	190,00	00 lbs.
<b>Dual Tandem</b>	270,0	00 lbs.		-	270,000 lb	
Blast Pad	13R: 200 ft. x 200 ft. 31L: 200 ft. x 200 ft. 13L: 150 ft. x 100 ft.		ft. x 100 ft.	4: 200 ft. x 200 ft. 22: 400 ft. x 220 ft.		
Declared Distances	13R	31L	13L	31R	4	22
Takeoff Run Available	8,502 ft.	8,502 ft.	5,519 ft.	5,519 ft.	8,505 ft.	8,505 ft.
Takeoff Distance Available	8,502 ft.	8,502 ft.	5,519 ft.	5,519 ft.	8,505 ft.	8,505 ft.
Accelerate-Stop Distance Available	8,502 ft.	8,502 ft.	5,519 ft.	5,669 ft.	8,905 ft.	8,205 ft.
Landing Distance Available	8,502 ft.	8,502 ft.	5,519 ft.	5,519 ft.	8,505 ft.	8,505 ft.
Effective Gradient	0.4	1%	0.4	1%	0.5% UP	0.3% DOWN
Runway Lighting	RCL,	F-II, TDZL, HIRL R, RCL, HIRL		IL, MIRL IIL, MIRL	4: MALS, I 22: REIL, I	RCL, HIRL RCL, HIRL
Runway Visual Approach Aids	P.A	API	PA	API	PA	ιPI
Runway Navigational Aids	ILS,	DME		-	4: ILS	/DME
Traffic Pattern	Le	eft	Le	eft	Le	eft

### 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



Notes:

ALSF-II: High Intensity Approach Lighting System With Sequenced Flashing Lights

DME: Distance Measuring Equipment HIRL: High Intensity Runway Lights ILS: Instrument Landing System

MALS: Medium Intensity Approach Lighting System

MALSR: Medium Intensity Approach Lighting System With Runway Alignment Indicator Lights

MIRL: Medium Intensity Runway Lights PAPI: Precision Approach Path Indicator REIL: Runway End Identifier Lights RCL: Runway Centerline Lights TDZL: Touchdown Zone Lights

Source: Federal Aviation Administration, Aeronautical Information Portal, https://nfdc.faa.gov/nfdcApps/, accessed July 2018.

#### **RUNWAY 4-22**

Runway 4-22 is a crosswind runway. It is 8,505 feet long and 150 feet wide. The RDC for Runway 4-22 is D-IV. Runway 4-22 has precision instrument markings on both ends. The Runway 4 end is equipped with an ILS, DME, and a PAPI, and the Runway 22 end is equipped with a PAPI. Runway 4-22 is equipped with RCL and HIRL, a medium intensity approach lighting system (MASL) on Runway 4, and a REIL on Runway 22.

Blast pads are located beyond the Runway 4 and Runway 22 ends, with dimensions of 200 feet by 200 feet and 400 feet by 220 feet, respectively. Runway 4-22 is a grooved concrete runway in good condition. The runway PCN is 91/R/B/W/T. The runway gradient is oriented southwest at a 0.5 percent upward slope on the Runway 4 end and a 0.3 percent downward slope on the Runway 22 end. Both runway ends have a left traffic pattern.

#### 2.2.2 TAXIWAYS

The taxiway system includes several runway exit taxiways that facilitate the flow of traffic. Taxiways connect runways to various airport facilities, such as the terminal, cargo area and hangars.

#### **DESCRIPTION OF TAXIWAY SYSTEM**

There are five taxiways parallel to a runway at SAT:

- Taxiways G and H for Runway 13R-31L
- Taxiway R for Runway 13L-31R
- Taxiways N and Q for Runway 4-22

Taxiways G and N are the only full-length parallel taxiways. The other taxiways, which are bypass taxiways, connector taxiways, cross-field taxiways, or high-speed exits, are Taxiways A, B, D, E, F, J, K, L, M, P, Q, RC, S, T, V, W, Y, and Z.

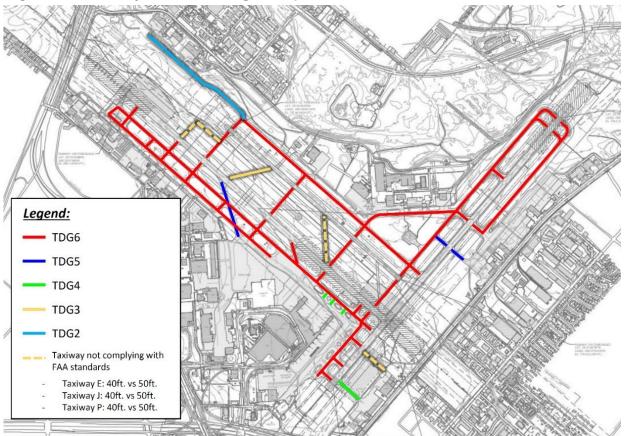


#### **TAXIWAY WIDTH**

All taxiways are 75 feet wide, with the following exceptions: Taxiway E, Taxiway H north of Taxiway Z, Taxiway J between Runway 13R-31L and Taxiway S, Taxiway J west of Taxiway H, Taxiway K west of Taxiway H, Taxiway S west of Taxiway H, Taxiway M, Taxiway P, Taxiway RC, and Taxiway W. These taxiways or taxiway segments are 50 feet wide or less. On **Figure 2.2-2**, the taxiway system is color-coded based on taxiway width and corresponding taxiway design groups (TDG). TDG is a classification of airplanes based on landing gear dimensions, which in turn determines the required taxiway width. The following taxiway widths are required:

- TDG 2: 35 feet
- TDG 3 and 4: 50 feet
- TDG 5 and 6: 75 feet

Figure 2.2-2: Taxiway Width and Design Group



Sources: San Antonio International Airport, Airport Layout Plan, 2017; WSP USA, 2018 (annotations).

#### **TAXIWAY SEPARATIONS**

The existing separations between taxiways and runways, and between taxiways are summarized in **Table 2.2-2**. These separations comply with the FAA requirements for Airplane Design Group (ADG) V for taxiways that are 75 feet wide, and for ADG III for taxiways that are 50 feet wide or less.



**Table 2.2-2: Taxiway Separations and Compliance with Design Standards** 

RUNWAY/TAXIWAY #1	TAXIWAY #2	EXISTING CENTERLINE-TO- CENTERLINE SEPARATION	MEETS SEPARATION STANDARD FOR AIRPLANE DESIGN GROUP
Runway 13R-31L	Taxiway G	400 ft.	V
Runway 13L-31R	Taxiway R	400 ft.	V
Runway 4-22	Taxiway N	450 ft.	V
Runway 4-22	Taxiway Q	400 ft.	V
Taxiway G (North)	Taxiway H	300 ft.	V
Taxiway G (South)	Taxiway H	215 ft.	IV
Taxiway G1	Taxiway G2	345 ft.	VI
Taxiway G2	Taxiway G3	240 ft.	IV
Taxiway N1	Taxiway N2	450 ft.	VI
Taxiway N2	Taxiway N3	650 ft.	VI
Taxiway N3	Taxiway G	440 ft.	VI
Taxiway N9	Taxiway N10	450 ft.	VI
Taxiway N10	Taxiway N11	450 ft.	VI
Taxiway N11	Taxiway N12	240 ft.	IV
Taxiway N12	Taxiway N13	450 ft.	VI
Taxiway N13	Taxiway G	215 ft.	IV

Sources: San Antonio International Airport, Airport Layout Plan, 2017; WSP USA, 2018.

#### **TAXIWAY RESTRICTIONS**

The following taxiway restrictions apply at SAT:

Taxiway A, Taxiway E, north portion of Taxiway H, northeast portion of Taxiway J, Taxiway M and Taxiway P are closed to aircraft 59,000 lbs. or greater.

Taxiway R west of Taxiway D are closed to aircraft over 270,000 lbs.

Taxiway G between Taxiway W and Runway 4-22, Taxiway R between Runway 13L and Taxiway D, and Taxiway S between Runway 13L and Runway 13R-31L are closed to aircraft with wingspans over 135 feet.

Taxiways B, L, and Z are closed to aircraft with wingspan greater 118 feet.

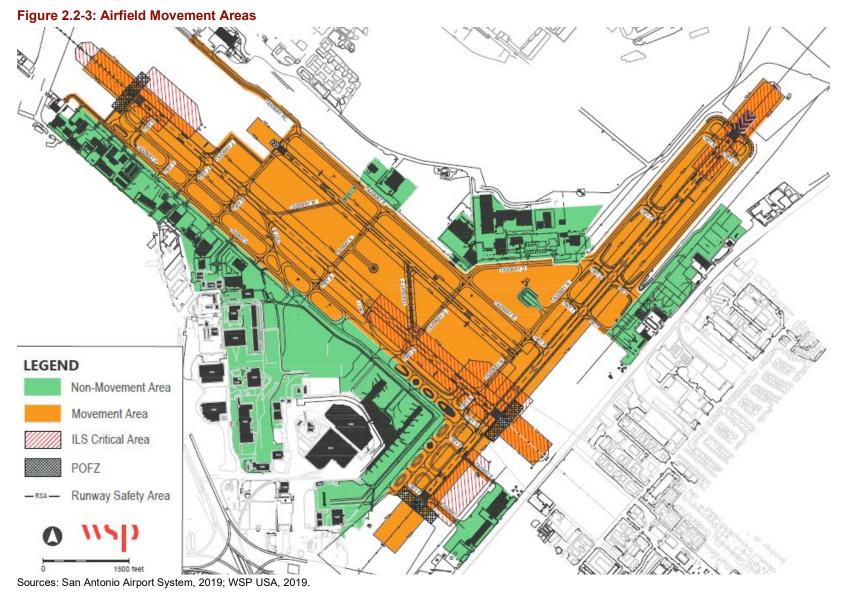


#### 2.2.3 MOVEMENT AREAS

SAT ATC is responsible for the safe, efficient, and expeditious flow of surface traffic in the airfield movement areas. The movement areas consist of runways, taxiways, and safety areas of the Airport, which are used for taxiing/hover taxiing, takeoff, and landing of aircraft. Loading ramps and apron parking areas are not considered movement areas; activity in these areas is the responsibility of the tenant and aircraft/vehicle operator. However, specific approval for entry onto the movement areas must be obtained from ATC. Figure 2.2-3 depicts the movement and non-movement areas at SAT.

Of note is the eastern portion of Taxiway H, which is not included in the airfield movement area, and is referred to as Taxilane H.







#### 2.2.4 HOT SPOTS

The FAA defines a hot spot (HS) as a location on an airport movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary. There are two active HSs published by the FAA, as shown on **Figure 2.2-4**.

HS 1 is located at the intersection of the Runway 31L end and Runway 4-22. Aircraft taxiing on Runway 4-22 to depart on Runway 31L miss the Runway 31L hold bar, which is often obscured by excessive rubber marks.

HS 2 is located at the intersection of the Runway 13R-31L and Taxiway N. Aircraft taxiing north on Taxiway N miss the turn onto Taxiway G and cross the Runway 13R-31L hold short line.



Figure 2.2-4: Hot Spots 1 and 2

Sources: Google Earth Pro, 2018 (aerial imagery); WSP USA, 2018 (annotations).

**Appendix 2B** discusses airfield geometry issues at the Runway 31L end and summarizes associated runway incursions, in the context of decoupling Runways 13R-31L and 4-22.

#### 2.2.5 WEATHER INFORMATION SOURCES

The Airport has eight windsocks, four of which are illuminated:

- north of the Runway 13L end
- west of the Runway 13R-31L centerpoint
- west of the Runway 4 end



east of the Runway 22 end

Weather information is generated by an Automated Surface Observing System (ASOS) and a Hazardous Inflight Weather Advisory Service (HIWAS).

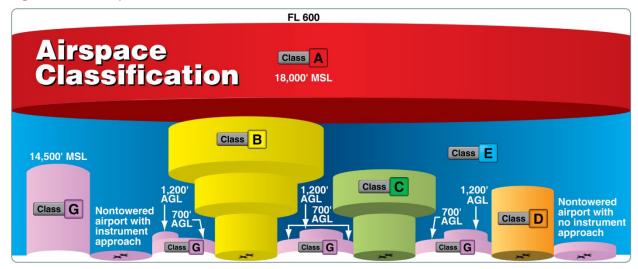
#### 2.3 AIRSPACE OPERATIONS

This section provides an overview of airspace classes (including the airspace at SAT and its vicinity), instrument approach procedures into SAT, ATC facilities handling SAT traffic, and the small unmanned aerial systems (sUAS) initiative.

#### 2.3.1 AIRSPACE CLASSES

This section describes the airspace around SAT, as well as FAA airspace control facilities and their general responsibilities and functions. The National Airspace System (NAS) is divided into six airspace classes: A, B, C, D, E (controlled airspaces), and Class G (uncontrolled airspace). These classes define the services provided by air traffic controllers to pilots, and consequently the procedures pilots must follow. Airspace classes are illustrated on **Figure 2.3-1**.

Figure 2.3-1: Airspace Classes



Source: Federal Aviation Administration, Pilot's Handbook of Aeronautical Knowledge, FAA-H-8083-25B, 2016.

A description of dimensions and requirements for each class of airspace is provided below:

- Class A airspace extends from 18,000 feet AMSL, or Flight Level (FL) 180, up to and including FL 600. Aircraft in Class A airspace must operate on an Instrument Flight Rules (IFR) flight plan. There are no minimum visibility requirements. To enter Class A airspace, aircraft must obtain ATC clearance, and be equipped with a two-way radio and an operating Mode C transponder.
- Class B airspace surrounds the busiest airports in the U.S. in term of enplanements and aircraft
  operations; it extends from the surface up to 10,000 feet AMSL. Class B airspace is shaped like an
  inverted wedding cake, with varying dimensions based on local conditions. To operate in Class B
  airspace, aircraft must be equipped with a two-way radio and an operating Mode C transponder.

### 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



Aircraft on an IFR flight plan are automatically cleared to operate in Class B airspace. Aircraft operating on a Visual Flight Rules (VFR) flight plan must obtain an ATC clearance before entering Class B airspace, and must maintain three miles visibility and remain clear of clouds.

- Class C airspace surrounds airports that have an ATC Tower (ATCT), are serviced by a radar approach control and have a certain number of enplanements or IFR operations; it extends from the surface to 4,000 feet above ground level (AGL). Class C airspace is shaped similarly to Class B, however, the Class C dimensions are standard. The inner core has a radius of 5 nautical miles (NM) up to 4,000 feet AGL. The outer core has a radius of 10 NM and starts from a minimum of 1,200 feet AGL up to 4,000 feet AGL. To operate in Class C airspace, aircraft must be equipped with a two-way radio and an operating Mode C transponder. Aircraft on an IFR flight plan are automatically cleared to operate in Class C airspace, while aircraft on a VFR flight plan must establish two-way radio communications with ATC, and must maintain three miles visibility and remain at least 500 feet below, 1,000 feet above, and 2,000 feet laterally from clouds.
- Class D airspace surrounds airports with an ATCT; it extends from the surface to 2,500 feet AGL. The shape of this airspace is cylindrical with an outer radius that can vary, but is generally 4 NM. To enter Class D airspace, aircraft on a VFR flight plan must establish two-way radio communications with ATC, and must maintain three miles visibility and remain at least 500 feet below, 1,000 feet above, and 2,000 feet laterally from clouds.
- Class E is any controlled airspace that is not Class A, B. C or D. Class E airspace generally extends from 1,200 feet AGL up to the lower limit of Class A airspace. Around non-towered airports, Class E airspace may begin at the surface. Class E airspace represents the majority of controlled airspace in the U.S. There are no requirements to operate in Class E airspace, except VFR aircraft must maintain three miles visibility and remain at least 500 feet below, 1,000 feet above, and 2,000 feet laterally from clouds when operating below 10,000 MSL, and five miles visibility and remain at least 1,000 feet below, 1,000 feet above, and 1 statute mile laterally from clouds when operating above 10,000 feet MSL.
- Class G is uncontrolled airspace and includes all airspace below 14,500 feet AMSL that is not classified as controlled airspace. There are no requirements to operate in Class G airspace, except VFR aircraft must maintain visibility and distance from clouds requirements, as summarized in Table 2.3-1.

Table 2.3-1: Class G Requirements for Aircraft Operating under Visual Flight Rules

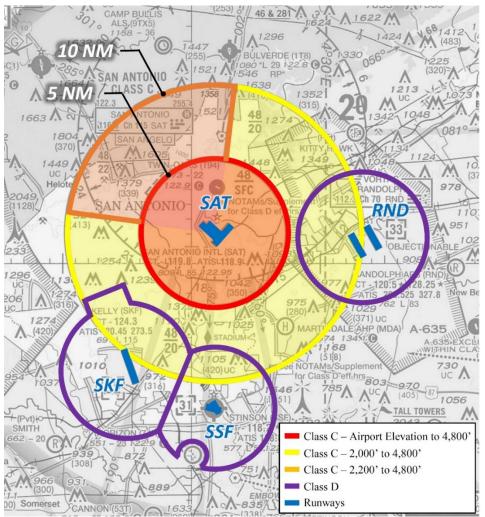
	LESS THAN 1,200 FT. AGL		FROM 1,200 FT. AGL TO 10,000 AMSL		ABOVE 10,000 FT. AMSL	
Time	Day	Night	Day	Night	All Time	
Visibility	1 Mile	3 Mile	1 Mile	3 Mile	5 Mile	
Above Clouds			1,000 ft.			
Below Clouds	Clear of clouds	500 ft.			1,000 ft.	
Laterally		2,000 ft.			1 Mile	



Source: Federal Aviation Administration, *Pilot's Handbook of Aeronautical Knowledge, FAA-H-8083-25B*, 2016.

SAT is surrounded by a Class C airspace, as shown on **Figure 2.3-2**. The airspaces around Randolph Air Force Base (RND), Port San Antonio (SKF), and Stinson Municipal Airport (SSF), the primary general aviation reliver airport for SAT, are Class D and overlap with SAT.

Figure 2.3-2: San Antonio International Airport Class C Airspace



Sources: Federal Aviation Administration, San Antonio Sectional Aeronautical Chart, 2018; WSP USA, 2018.

SAT airspace follows the standard Class C profile: 5 NM-radius inner core from the surface to 4,800 feet AMSL, and 10 NM-radius outer core, which is divided into two areas. The northwest quarter of the outer core has an elevation of 2,200 feet AMSL to 4,800 feet AMSL, and the remainder of the core has an elevation of 2,000 feet AMSL to 4,800 feet AMSL. RND, SSF, and SKF airspaces follow the standard Class D profile (cylinder from the airport elevation to 3,300 feet AMSL for RND, 3,100 feet AMSL for SSF, and 3,200 feet AMSL for SKF).

RND training operations are supported by four Military Operations Areas (MOA):

### 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



- Randolph 1A: East of San Antonio, from 8,000 feet AMSL to FL180.
- Randolph 1B: South-East of San Antonio, from 7,000 feet AMSL to FL180.
- Randolph 2A: West of San Antonio, from 7,500 feet AMSL to FL180.
- Randolph 2B: West of San Antonio, from 14,000 feet AMSL to FL180.

The hours of operations of the MOAs are between sunrise and sunset Monday through Friday but can be extended at other times with coordination with the SAT ATCT and Terminal Radar Control facility.

There are also two Alert Areas, which are areas experiencing high volumes of training flights or supporting unusual types of aeronautical activities:

- Alert Area 635: East of San Antonio, from 1,500 feet AMSL to 4,000 feet AMSL. This area excludes the airspace within Class C and D airspace.
- Alert Area 638: East of San Antonio, from the surface to 3,000 feet AMSL.

Local MOAs and Alert Areas are shown on Figure 2.3-3.

#### 2.3.2 INSTRUMENT APPROACH PROCEDURES

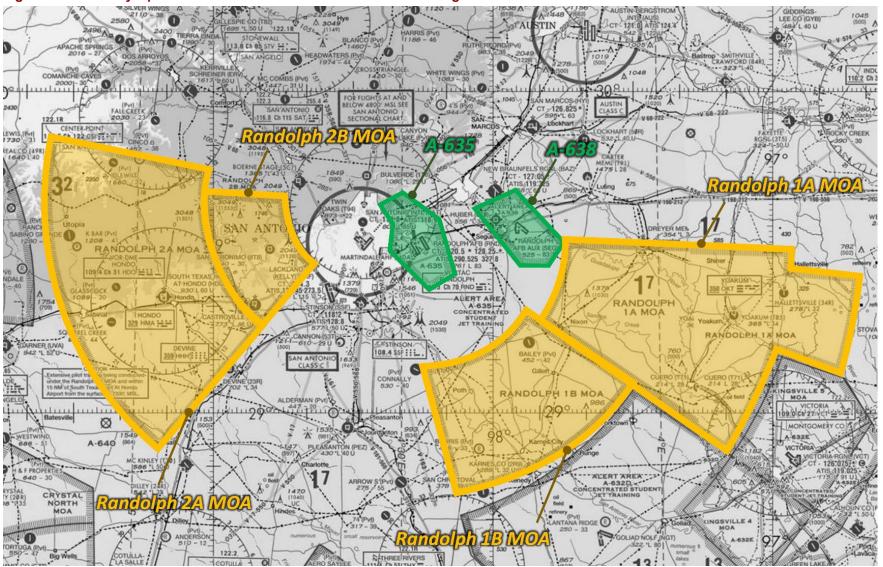
Instrument approach procedures define paths and altitudes for pilots to follow during an instrument landing. The SAT instrument approach minimums are summarized in **Table 2.3-2**. In Table 2.3-2, the first number indicates the decision height or minimum descent altitude above the touchdown zone elevation, and the second number indicates the lowest visibility for an aircraft to start the approach.

Aircraft enters the SAT Terminal Control Area (TCA) via Standard Terminal Arrival Routes (STARs). There are five STARs for SAT: BRAUN TWO, CENTERPOINT TWO, LEMIG ONE, MARCS ONE, and STONEWALL ONE. Each of these procedures routes traffic to the intersection of which they bear the name. Furthermore, for CENTERPOINT TWO and STONEWALL ONE, the routes are converging to a VHF Omnidirectional Range Tactical Air Navigation (VORTAC). Figures 2C-1 to 2C-4 in Appendix 2C show ATC's preferred routing from these arrival routes to SAT's runways.

Likewise, aircraft depart SAT via seven Departure Procedures (DPs): ALAMO TWO, ALISS FIVE, BOWIE SEVEN, LEJON FOUR, MILET FOUR, SETZR TWO and THREE RIVERS FOUR. **Figure 2.3-4** depicts the entry and exit fixes of the SAT TCA, and associated STARs and DPs.



Figure 2.3-3: Military Operations and Alert Areas in the San Antonio Region



Sources: Federal Aviation Administration, San Antonio Sectional Aeronautical Chart, 2018; WSP USA, 2018.



# **Table 2.3-2: Instrument Approach Procedures**

DECISION HEIGHT OR MINIMUM DESCENT ALTITUDE / VISIBILITY MINIMUM					
APPROACH CATEGORY	A	В	C	D	E
Runway 13R					
ILS		200 ft./ 1,800	ft.		NA
ILS (CAT II)		100 ft./ 1,200	ft.		NA
LOC	631 ft./ 2	631 ft./ 2,400 ft. 631 ft./ 1% SM		1% SM	NA
RNAV RNP Z					
RNP 0.15		341 ft./ 3,000 ft.			NA
RNP 0.30		341 ft./ 6,000	ft.		NA
RNAV GPS Y					
LPV	298 ft./ 2,400 ft.			NA	
LNAV/VNAV		531 ft./ 1% SM			NA
LNAV only	811 ft./ 2,400 ft.	811 ft./ 4,000 ft.	811 ft./	1% SM	NA
		Runway 31L			
ILS		200 ft./ 2,400	ft.		NA
LOC	570 ft./ 2	570 ft./ 2,400 ft.		1¼ SM	NA
RNAV RNP Z 0.30	442 ft./ 5,000 ft.		NA		
RNAV GPS Y					
LPV		417 ft./ 5,000 ft.			NA
LNAV/VNAV	456 ft./ 6,000 ft.		NA		
LNAV only	570 ft./ 2,400 ft.		570 ft./	11/4 SM	NA
		Runway 4			
ILS	200 ft./ 4,000 ft.		NA		
LOC	434 ft./ 4,000 ft.		434 ft./	5,000ft.	NA
RNAV RNP Z					
RNP 0.15	385 ft./ 5,000 ft.			NA	
RNP 0.30	498 ft./ 11/2 SM			NA	
RNAV GPS Y					
LPV	200 ft./ 4,000 ft.			NA	
LNAV/VNAV	415 ft./ 6,000 ft.		NA		



# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions

LNAV only	494 ft./ 4,000 ft.	494 ft./ 6,000 ft.	NA			
	Runway 22					
RNAV RNP Z						
RNP 0.15	350 ft./ 11/ <sub>8</sub> SN	NA				
RNP 0.30	550 ft./ 11/8 SM	NA				
RNAV GPS Y						
LPV	200 ft./ 3/4 SM		NA			
LNAV/VNAV	455 ft. / 1% S	NA				
LNAV only	470 ft./ 1 SM	470 ft./ 1% SM	NA			

#### Notes:

ILS - Instrument Landing System.

LOC - Localizer.

RNAV – Area Navigation.

RNP – Required Navigation Performance.

GPS – Global Positioning System.

SM - Statute Mile

LPV - Localizer Performance with Vertical

Guidance.

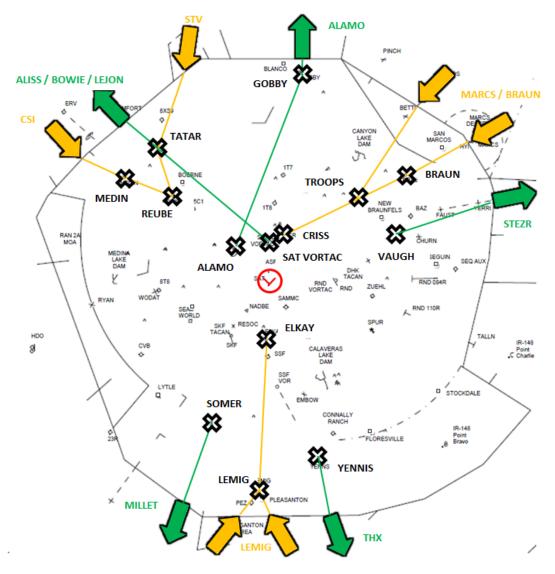
LNAV - Lateral Navigation.

VNAV - Vertical Navigation.

Source: Federal Aviation Administration, Terminal Procedures Publication, SouthCentral-3, July-2018.



Figure 2.3-4: Arrival and Departure Procedures



Source: San Antonio International Airport, Airport Traffic Control Tower Operations Procedures, 2018.

#### 2.3.3 AIR TRAFFIC CONTROL FACILITIES

The San Antonio area has a Terminal Radar Approach Control (TRACON) facility that handles arrival and departure operations at SAT, SKF, RND, SSF and New Braunfels Airport (BAZ), and enroute operations controlled by Houston Air Route Traffic Control Center (ARTCC) that transition through the San Antonio area.

The SAT TRACON provides IFR service and instrument approaches to three other airports: Pleasanton Airport (PEZ), Boerne Stage Airport (5C1) and Castroville Airport (CVB).

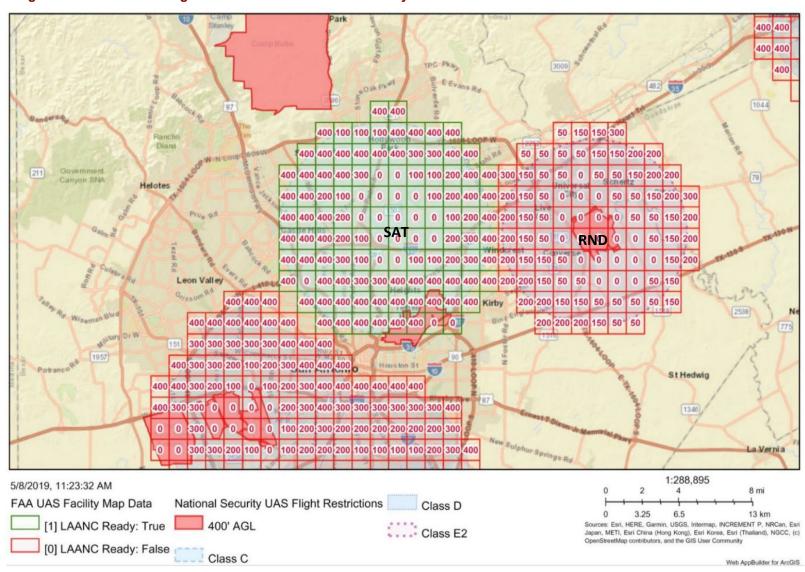


#### 2.3.4 SMALL UNMANNED AERIAL SYSTEMS

The SAT ATCT is participating in the Low Altitude Authorization and Notification Capability (LAANC) initiative for sUAS, a collaboration between the FAA and Industry. It directly supports sUAS integration into the airspace by providing access to controlled airspace near airports, through near real-time processing of airspace authorizations. **Figure 2.3-5** shows the maximum flight altitude (AGL) around SAT allowed for sUAS under 55 pounds. Flying above these altitudes requires coordination with and approval from the SAT ATCT and the airport, as it might impact aircraft operations and safety. sUAS cannot fly above 400 feet under Title 14 Part 107 of the U.S. Code of Federal Regulations (CFR).



Figure 2.3-5: Maximum Flight Altitude for Unmanned Aerial Systems



Source: Federal Aviation Administration, Unmanned Aerial System Map Data, May 2019.



# 2.4 PASSENGER TERMINAL FACILITIES

The passenger terminal facilities for commercial flights are depicted in **Figure 2.4-1**. They are located on the southwest side of the airport property, bordered by the CONRAC and parking garage, the West Ramp, Runway 13R-31L, and the Runway 4 threshold. The main components of the terminal facilities are Terminal A (south) and Terminal B (north), as well as the West Ramp for remote overnight parking. The two terminal buildings are adjacent, providing a contiguous facility with a single curb front. The two terminals have a combined area of approximately 642,000 square feet.

13R.371 **West Ramp** Rental Car **Parking** Garage 22

Figure 2.4-1: Commercial Passenger Terminal Facilities

Sources: Google Earth Pro, 2019 (aerial Imagery); WSP USA, 2019 (annotations).

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



Passenger terminal facilities for general aviation primarily are discussed in Section 2.6 and include:

- Two general aviation terminals operated by Signature Flight Support ("West Campus" and "South Campus"), both located along Sandau Road, north of the West Ramp.
- One general aviation terminal operated by MillionAir, located along Wetmore Road at the edge of the East Cargo Ramp. The facility is shared with Hallmark University.
- Skyplace FBO and other FBOs at SAT have facilities for accommodating their general aviation passengers.

#### 2.4.1 TERMINAL A FACILITIES

#### TERMINAL LAYOUT

Terminal A includes the operations of American Airlines, Southwest Airlines, Delta Air Lines, Frontier Airlines, Alaska Airlines, Allegiant Air and the foreign air carriers. Terminal A has passenger facilities on two levels, as described below (see **Figure 2.4-2** to **Figure 2.4-7**):

- A central core with:
  - Retail and restrooms in the public area (upper/departures level).
  - Ticketing/check-in counters and airline offices (upper/departures level) There is a total of 55 check-in counter positions, plus 25 kiosks located in the check-in lobby. Of the 55 check-in counter positions, 10 are currently vacant or unused.
  - Transportation Security Administration (TSA) security screening checkpoint (SSCP) (upper/departures level) The SSCP has a total of eight lanes (as defined by carry-on baggage X-rays). There are four full body scanners (Advanced Imaging Technology), backed up with more conventional walk-thru metal detectors. Three queues are provided: general passengers, premium passengers/employees/crews, and TSA Pre-check.
  - Federal Inspection Service (FIS) facilities (lower/arrivals level) The FIS is being expanded and reorganized to accommodate current inspection procedures and facilities (see Section 2.4.4).
  - Baggage carrousels and airline baggage service offices (lower/arrivals level) There are three claim units, each with 135 linear feet (LF) of claim frontage for a total of 405 LF.
  - Checked baggage screening and bag make-up areas (lower/arrivals level) The screening system has three L3 6600 Explosive Detection System (EDS) units, and is interconnected with the EDS units in Terminal B.



Figure 2.4-2: Terminals A and B - Arrivals Level Floor Plan

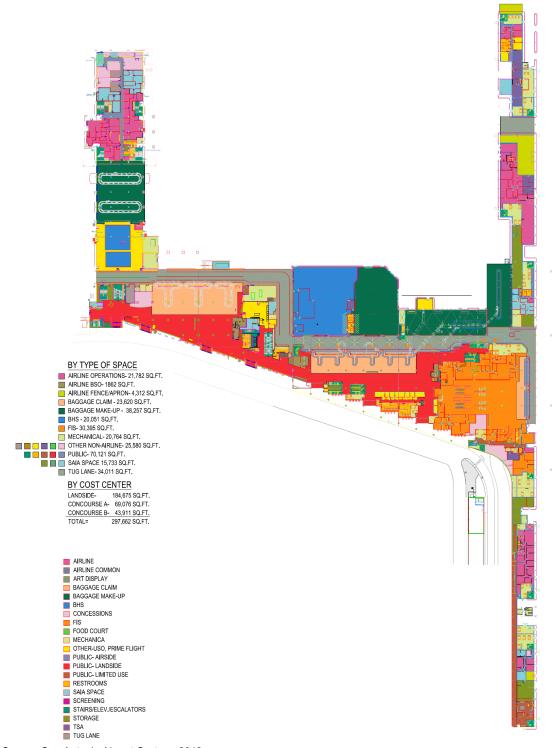




Figure 2.4-3: Terminals A and B - Arrivals Level Space Allocation by Airport Function

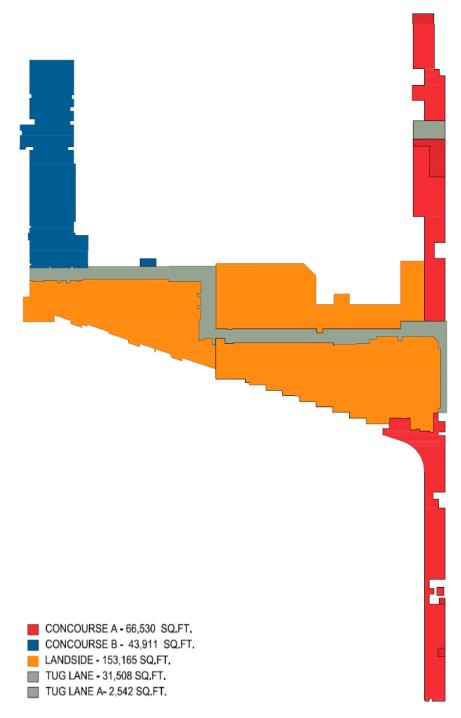




Figure 2.4-4: Terminals A and B - Arrivals Level Space Allocation by Stakeholder

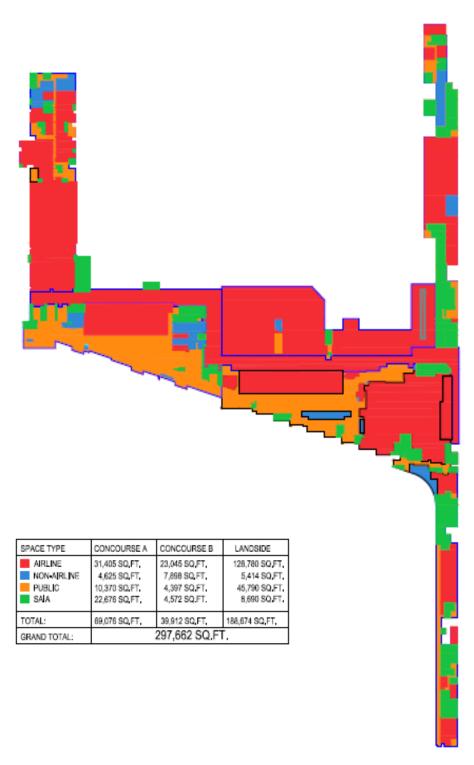




Figure 2.4-5: Terminals A and B - Departures Level Floor Plan

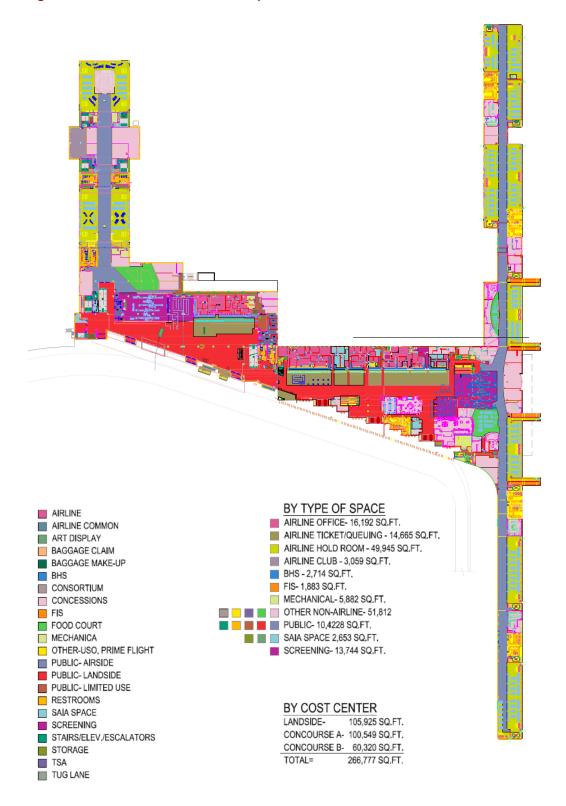




Figure 2.4-6: Terminals A and B – Departures Level Space Allocation by Airport Function

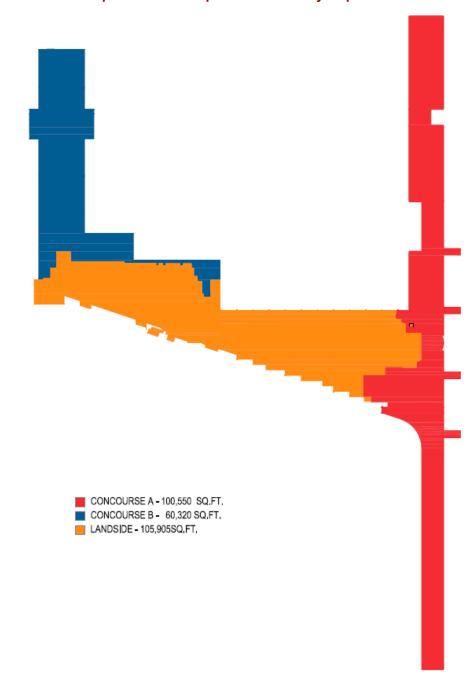
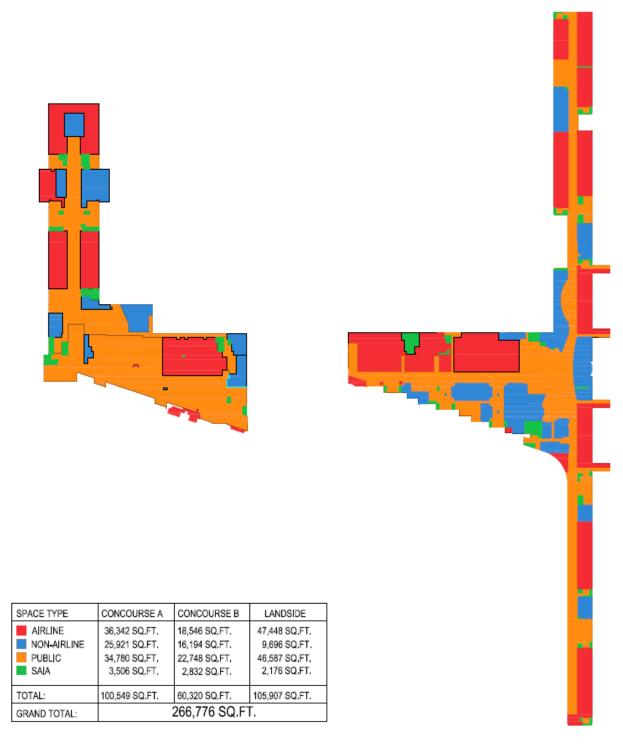




Figure 2.4-7: Terminals A and B - Departures Level Space Allocation by Stakeholder



# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



#### A concourse with:

- Hold rooms and gates (upper/departures level).
- Retail, food and beverage, and restrooms in the secure area (upper/departures level).
- Airline operations and support spaces (lower/arrivals level).

In addition to the passenger processing levels, there are a service level below the arrivals level containing mechanical and support spaces, and a mezzanine with Airport administration spaces.

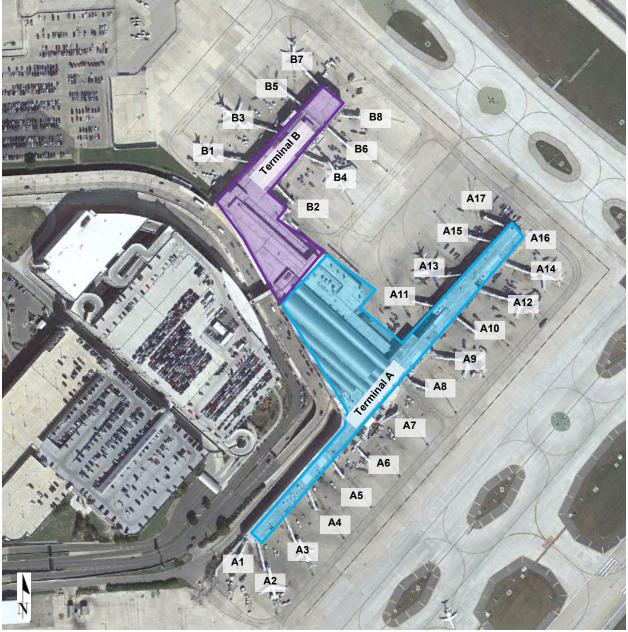
#### **AIRCRAFT GATES**

There are 16 gates in Terminal A, labeled from A1 through A17 (A16 does not have a passenger loading bridge and is not used), as shown on **Figure 2.4-8**, with the following preferred airline allocations:

- Two gates for American Airlines (A15 and A17) formerly allocated to U.S. Airways.
- Six gates for Southwest Airlines (A9-international arrival flight capable, A10, A11, A12, A13 and A14).
- Three gates for Delta Air Lines (A2, A3 and A4).
- One gate for Frontier Airlines (A5).
- Three gates for multiple airlines, including international arrivals flights (A6, A7 and A8).
- One SAAS-owned gate without preferred allocation (A1).



Figure 2.4-8: Terminals A and B Gates



Sources: Google Earth Pro, 2019 (aerial Imagery); WSP USA, 2019 (annotations).

### 2.4.2 TERMINAL B FACILITIES

### **TERMINAL LAYOUT**

Terminal B includes the operations of American Airlines and United Airlines. Terminal B has passenger facilities on two levels, with a variety of areas, which are discussed below (also see Figure 2.4-2 to 2.4-7):

• A central core with:

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



- Ticketing/check-in counters and airline offices (upper/departures level) There is a total of 25 check-in counter positions and in-line kiosks, plus 13 kiosks located in the check-in lobby. Of the 25 check-in counter positions, three are currently unused.
- TSA SSCP (upper/departures level) The SSCP has a total of four lanes (as defined by carryon baggage X-rays). There are two full body scanners (Advanced Imaging Technology),
  backed up with more conventional walk-thru metal detectors. Three queues are provided:
  general passengers, premium passengers/employees/crews, and TSA Pre-check.
- Baggage carrousels and airline baggage service offices (lower/arrivals level) There are three claim units: two with 125 LF of claim frontage, and one with 110 LF, for a total of 360 LF.
- Checked baggage screening and bag make up areas (lower/arrivals level) The screening system has two L3 6600 EDS units and is interconnected with the EDS units in Terminal A.

#### A concourse with:

- Hold rooms and gates (upper/departures level).
- Retail, food and beverage, and restrooms in the secure area (upper/departures level) United Airlines has a club lounge between gates B3 and B5.
- Airline operations and support spaces (lower/arrivals level).

In addition to the passenger processing levels, there are a service level below the arrivals level containing mechanical and support spaces, and a mezzanine with mechanical equipment.

#### AIRCRAFT GATES

There are eight gates in Terminal B, labeled B1 through B8, as depicted on Figure 2.4-8, with the following preferred airline allocations:

- Five gates for United Airlines (B1, B3, B5, B7, B8).
- Three gates for American Airlines (B2, B4, B6).

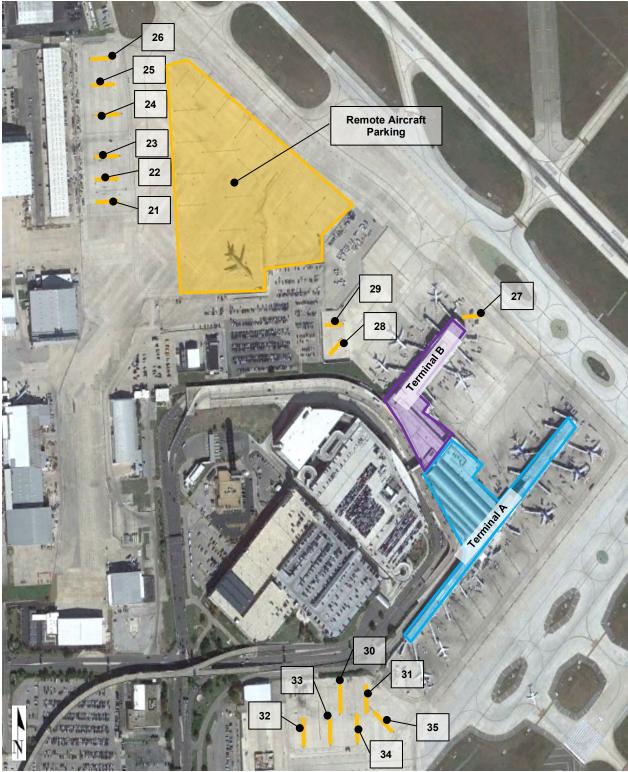
#### 2.4.3 REMOTE/REMAIN OVERNIGHT PARKING POSITIONS

**Figure 2.4-9** depicts the location of the Remain Overnight Parking (RON) aircraft parking positions, also used for temporary, short-term remote parking.

- Six positions are located on the South Ramp, designated 30 to 35
- Two positions, designated 28 and 29, are located north of Terminal B
- One position, designated 27, is located at the end of Terminal B, between gates B7 and B8
- Six positions, designated 21 through 26, are located east of the West Cargo complex. Two of these
  positions can be combined into a widebody aircraft position. American Airlines and United Airlines
  lease these positions for line maintenance.
- 15 acres of apron located between the West Cargo Complex and Terminal B.



Figure 2.4-9: Remote/Remain Overnight Aircraft Parking Positions



Sources: Google Earth Pro, 2019 (aerial imagery); WSP USA, 2020 (annotations).



#### 2.4.4 FEDERAL INSPECTION SERVICE FACILITIES

The Customs and Border Protection (CBP) of the U.S. Department of Homeland Security (DHS) operates the FIS facilities at SAT. These facilities are located at:

- Terminal A for passengers and crew members of international commercial flights.
- CBP building, located between SkyPlace FBO and M7 Aerospace on Skyplace Boulevard (accessible from Taxiway D) for passengers and crew members of general aviation flights.

#### **TERMINAL A**

Four contact gates at Terminal A provide direct access to the FIS facilities: A6, A7, A8 and A9. These gates are "swing gates" and can accommodate both domestic and international arrivals, using doors controlling access to either the sterile international corridor to the FIS facilities or the secure holdroom for domestic arrivals.

The FIS facilities are located on the first floor. Arriving international passengers take the ramp down to a sterile corridor, then proceed to the FIS facilities using an elevator, escalator, or stairs.

Currently, the passenger flow is to first claim baggage and then queue up for primary inspection at one of the four double inspection booths. There are six Global Entry kiosks. Secondary inspection is immediately after the primary booths. This is an atypical inspection process flow.

The FIS is currently being expanded and reorganized to accommodate current inspection procedures and facilities. This will include a larger baggage claim unit (125 LF of claim frontage), with space for a second future claim unit, self-service Automated Passport Control (APC) kiosks for U.S. and some foreign passengers, additional Global Entry kiosks, and a unified secondary inspection area. There will be four double booths for primary inspection with space for a fifth. CBP support space will also be reorganized.

#### **GENERAL AVIATION**

The CBP Customs facilities for general aviation is located near the SkyPlace FBO, and is accessible from Skyplace Boulevard and Taxiway D. The building is approximately 75 feet by 75 feet, and the aircraft ramp is approximately 60,000 square feet and has two parking positions for general aviation aircraft. Each position can accommodate large corporate jets (e.g. Gulfstream V).

#### 2.4.5 TERMINAL OBSERVATIONS

Terminals passenger activity observations were conducted between June 8th and June 15, 2018, to gain a thorough understanding of how the existing terminal functions throughout the day, and to confirm passenger activity characteristics, which will be used in *Chapter 5 - Facility Requirements*. The observations documented passenger flow patterns and identified areas of congestion during peak periods.

#### 2.4.6 TERMINAL CURBSIDES

East Terminal Drive leads to SAT's two-level terminal curbside. The upper-level terminal curbside serves departing passengers for both Terminals A and B. Two lanes lead up to the upper terminal curbside, with



the innermost lane eventually splitting into three lanes, resulting in a total of four lanes for the upper curbside. There are approximately 350 feet of curbside in front of each terminal, resulting in approximately 700 feet of terminal curbside for the upper level. In front of Terminal A, the innermost lane is designated for vehicles dropping off passengers at Terminal A. The middle two lanes are designated for those progressing to Terminal B for passenger drop-offs. The outer most lane is for through traffic. **Figure 2.4-10** shows the departures curbside for Terminal A. The passenger skybridge connecting the CONRAC and the terminal building is the approximate point where the curbside transitions from Terminal A to Terminal B. In front of Terminal B, the inner two lanes are for vehicles dropping off passengers at Terminal B, with the outer two lanes designated for through traffic. The Terminal B departures curbside is shown on **Figure 2.4-11**.

Figure 2.4-10: Terminal A Departures Curbside



Source: WSP USA, 2018.



Figure 2.4-11: Terminal B Departures Curbside

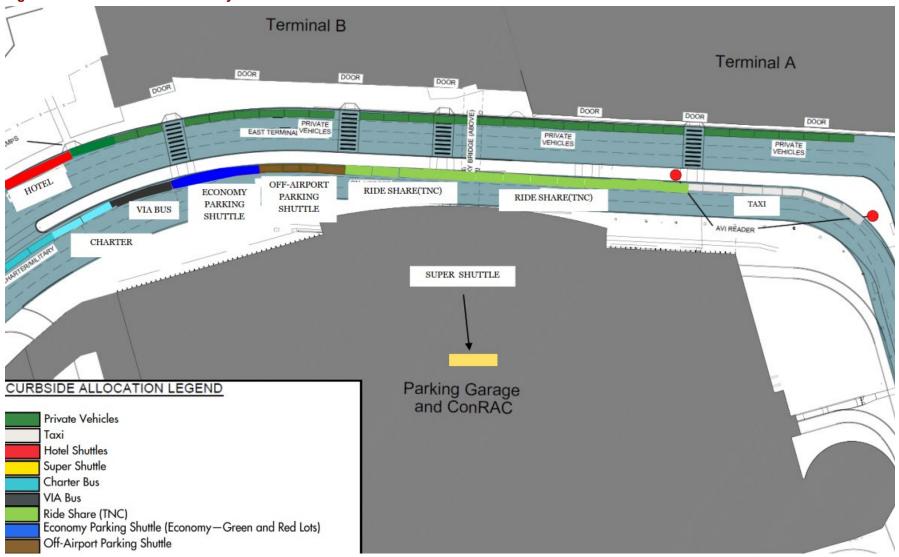


Source: WSP USA, 2018.

The lower-level terminal curbside serves arriving passengers. It consists of an inner curb portion with four lanes exclusively for private vehicles. The layout matches the upper-level terminal curbside with approximately 700 feet of curb. The inner lane in front of Terminal A is designated for vehicles picking up passengers at Terminal A, the middle two lanes are for vehicles continuing to Terminal B to pick up passengers, and the outer lane is for through traffic. In front of Terminal B, the inner two lanes are for passenger pick-ups at Terminal B and the outer two lanes serve through traffic. Beyond the private vehicle pick-up area, there are approximately 200 feet of curbside dedicated to hotel shuttles. The outer lower-level curbside serves taxis, Transportation Network Companies (TNCs), parking shuttles and buses. The first 150 feet of curbside are designated for taxis and the next 300 feet of curbside are for TNCs to pick up passengers. The remainder of the curbside is for off-airport parking shuttles, economy parking shuttles, VIA Metropolitan Transit buses and charter buses. **Figure 2.4-12** through **Figure 2.4-14** the arrivals curbsides.



Figure 2.4-12: Arrivals Curbside Layout



Sources: San Antonio International Airport, Airport Layout Plan, 2017 (basemap); WSP USA, 2019.



Figure 2.4-13: Outer Arrivals Curbside – Taxis and Transportation Network Companies



Source: WSP USA, 2018.

Figure 2.4-14: Outer Arrivals Curbside – Transportation Network Companies, Parking Shuttles and Buses



Source: WSP USA, 2018.



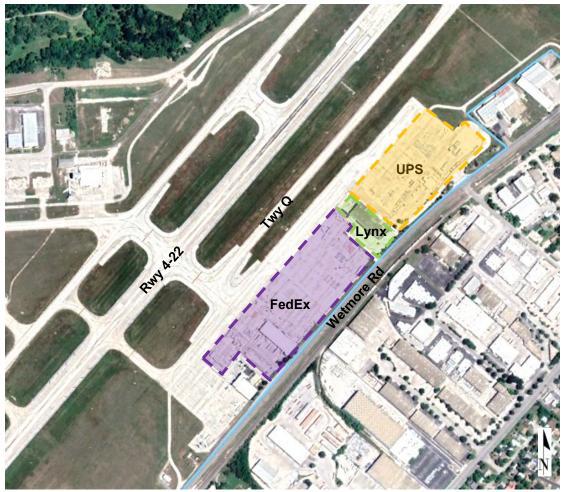
# 2.5 AIR CARGO FACILITIES

Air cargo facilities are located adjacent to the West Ramp and on the East Cargo Ramp. Cargo tenants include passenger airlines carrying cargo (belly cargo), as well as dedicated all-cargo airlines and ground handlers.

#### 2.5.1 INTEGRATOR CARGO FACILITIES

Integrator cargfo facilities are located on the East Cargo Ramp, as shown on **Figure 2.5-1.** The East Cargo Ramp serves the FedEx, UPS and Lynxs cargo facilities. It is located on the east side of the airfield, off Wetmore Road. Taxiway Q provides airfield access.

Figure 2.5-1: East Cargo Facilities



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2020 (annotations).

FedEx operates a 30,300-square-foot building, built in 1970, that houses the sorting operations and six truck loading doors. The overall FedEx site is approximately 22 acres (including the adjacent apron taxilane).



UPS operations are located at the northeast corner of the East Cargo Ramp, on a 14-acre site, including the adjacent apron taxilane and a 5,100-square foot building. Most of the UPS operations occur on their apron.

WFS provides ground handling services for UPS, out of the Lynx Cargo Building, a 40,000-square-foot facility with employee parking adjacent to the building. The overall Lynx Cargo site is approximately 3 acres (including the adjacent apron taxilane).

A 23,700-square foot vacant facility is located at the southwestern end of the East Cargo area.

### 2.5.2 BELLY CARGO FACILITIES

Belly cargo operations are conducted in the West Cargo Building, depicted on **Figure 2.5-2**, and located off Jones Maltsberger Road on John Saunders Road.

Figure 2.5-2: West Cargo Building



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2020 (annotations).



The West Cargo Building accommodates a variety of operations:

- Belly cargo warehousing: American Airlines, Delta Air Lines, Alaska Airlines, Frontier Airlines, Southwest Airlines and United Airlines.
- Cargo handling services: World Flight Services (WFS) for United Airlines, American Airlines, Alaska Airlines and Frontier Airlines.
- Non-cargo functions:
  - WFS: Ground Support Equipment (GSE) maintenance for American Airlines and Unites Airlines
  - American Airlines Line Maintenance: aircraft line maintenance
  - United Airlines Technical Operations: GSE and aircraft line maintenance
  - Southweset Airlines: GSE and aircraft line maintenance
  - STS Aviation Group: GSE & aircraft line maintenance
  - Delta Global Services (DGS): ground handling
  - World Duty Free: concessions commissary
  - Airport storage
  - Airport K-9 operations

## 2.6 GENERAL AVIATION FACILITIES

General aviation (GA) facilities are located in the east, west and northwest areas of the airfield. GA operations include corporate and business travel, recreational flying and medical transport, along with facilities for FBOs and maintenance, repair and overhaul (MRO) operations.

#### 2.6.1 FIXED BASE OPERATORS

SAT has three FBOs serving the general aviation community, as depicted in dark blue shading on **Figure 2.6-1**.

Million Air is adjacent to the Airport fuel storage facilities, on Wetmore Road, and shares facilities with Hallmark University (airframe and powerplant training school). Million Air provides FBO services, including fuel sales. The facilities are comprised of a 13,700-square-foot hangar that houses 14 based aircraft. Runway 4 is accessed directly by Taxiway F. Million Air leases space to Merlin1, a company specializing in private jet charters.

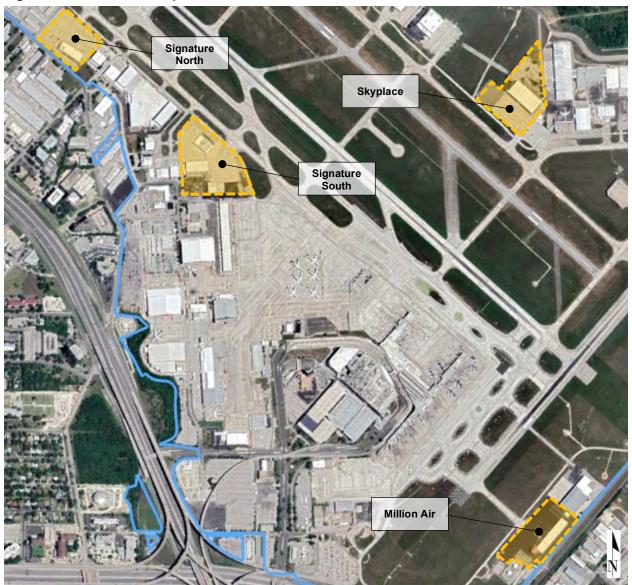
Signature Flight Support has three locations at SAT. Signature North was previously Landmark Aviation. The north location has a 36,700-square-foot facility, with a 25,000-square-foot hangar located off Sandau Road; airfield access is through Taxiway H. Signature South, on Paul Wilkins Street, has a 60,900-square-foot facility that includes hangar space and offices; airfield access is also through Taxiway H. The south location contains three hangars (23,000 square feet, 25,000 square feet and 47,000 square feet [includes]



the terminal]). The Signature Flight Support facilities include a fuel farm at both the north and south locations, both providing Jet A and aviation gasoline (Avgas).

SkyPlace FBO is located on Skyplace Boulevard, on the north side of the airfield. Airfield access is through Taxiways R and D. SkyPlace FBO was recently converted to a FBO from a MRO. The facility contains two hangars, 35,000 square feet each. There are 25 aircraft ranging from a Cessna 172 to a Gulfstream 650, semi-based or fully-based at this facility. It is located adjacent to the U.S. CBP facility. They do not have a fuel farm on site, but receive fuel from Allied Aviation.

Figure 2.6-1: Fixed-Base Operator Facilities



Sources: San Antonio International Airport, Airport Layout Plan, 2017 (basemap); WSP USA, 2018 (annotations).

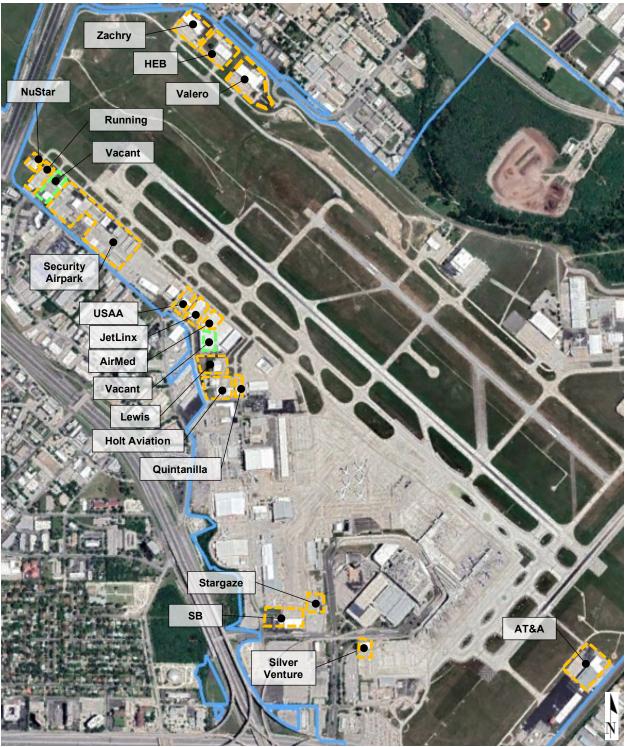


# 2.6.2 CORPORATE AND GENERAL AVIATION OPERATORS

A variety of corporate and general aviation tenants are based at SAT, as shown on **Figure 2.6-2**, and described below:



**Figure 2.6-2: Corporate and General Aviation Operators** 



Sources: San Antonio International Airport, Airport Layout Plan, 2017 (basemap); WSP USA, 2021 (annotations).

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



- Air Medical (AirMed) provides medical transport services, mostly for the local Children's Hospital.
  The site typically houses five to six aircraft at a time. They run a 24/7 operation and always have
  flight crews and mechanics on-site or on-call. Air Medical is located in the Premier Aeronautique
  Complex.
- JetLinx provides charter flights and operates out of one hangar in the Premier Aeronautique Complex.
- Stargazer, located south of the VT SAA campus, owns and operates one aircraft for the company's owner and family.
- Security Airpark is located on the northwest side of the airfield on 15 acres. It consists of T-hangars, and corporate hangars with 30 tenants.
- Other tenants include AT&A, H.H. Holt Aviation, HEB Grocery Company, Lewis Energy Group, NuStar, Quintanilla Management, Running M Hangar Services, Silver Ventures, USAA Flight Operations, Valero and Zachry Industrial.

Vacant general aviation hangars are:

- Old Cutter Aviation facilities (2.6 acres)
- Two hangars in Premier Aeronautique Complex (2.5 acres)

#### 2.6.3 GENERAL AVIATION CUSTOMS FACILITY

A 5,000 square foot U.S. CBP facility is located on the north side of the airfield, as depicted in **Figure 2.6-3**. It provides customs processing of international private flights. The facility was built in 2017.



Figure 2.6-3: General Aviation Customs Facility



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).

# 2.7 AVIATION SUPPORT FACILITIES

Aviation support facilities at SAT include facilities such as airport administration, airport operations, aircraft maintenance, air traffic control, airport maintenance, aircraft rescue and firefighting, fuel storage and fencing facilities.

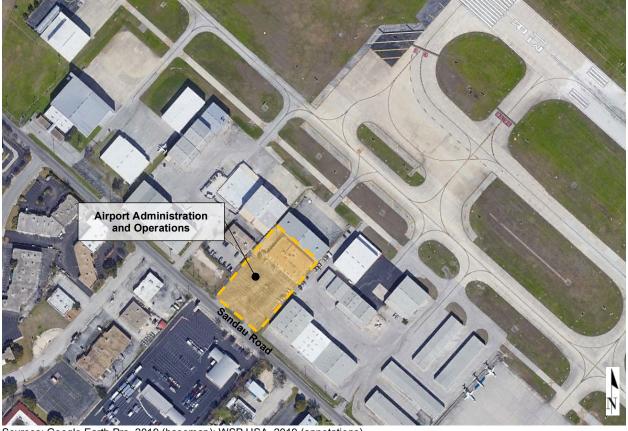
#### 2.7.1 AIRPORT ADMINISTRATION FACILITIES

The SAAS administration offices are split between the Terminal A Mezzanine and a facility on Sandau Road.

The Sandau Road facility, depicted in **Figure 2.7-1**, is in fair condition, but lacks adequate space. Administrative facilities in general are lacking adequate conference room space and should be consolidated for better staff efficiency. A space study will be conducted as part of the SDP to determine future needs.



Figure 2.7-1: Airport Administration and Operations Facilities



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).

### 2.7.2 AIRPORT OPERATIONS FACILITIES

The SAT Airport Operations facilities are co-located with the SAAS Administration Facilities on Sandau Road, as depicted on Figure 2.7-1. The facilities are in fair condition, but lack adequate space. The Airport Operations facilities do not have direct airfield access.

A new Airport Integrated Control Center (AICC) facility is planned adjacent and west of the Airport Rescue and Fire Fighting (ARFF) station, as depicted on **Figure 2.7-2**.



Figure 2.7-2: Airport Integrated Control Center

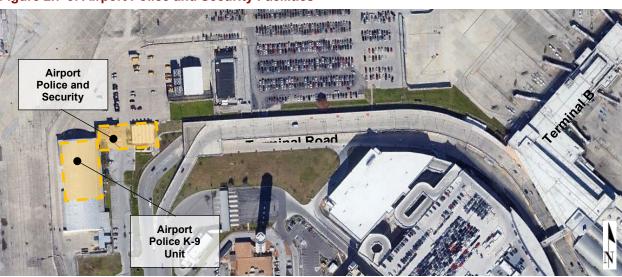


Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).

#### 2.7.3 AIRPORT POLICE AND SECURITY FACILITIES

The SAT Airport Police and Security facilities are located west of the terminal complex, as depicted in **Figure 2.7-3**, in several buildings.

Figure 2.7-3: Airport Police and Security Facilities



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).



Airport badging services are provided in the easternmost building, which is a historic building. The Airport Police K-9 unit uses space in Hangar 4. Facility condition is fair, and space is inadequate.

### 2.7.4 AIRPORT MAINTENANCE FACILITIES

The SAT Airport Maintenance facilities are located off Jones Maltsberger Road, near the West Cargo Building, as depicted on **Figure 2.7-4**. The SAT Airport Maintenance Facilities house both airfield and facilities maintenance.

Figure 2.7-4: Airport Maintenance Facilities



Sources: San Antonio International Airport, Airport Layout Plan, 2017 (basemap); WSP USA, 2018 (annotations).

The Airfield Maintenance group consists of 45 employees and is responsible for the entire airfield. This includes painting and striping of airfield pavement, airport roadways and parking facilities; pavement repairs, including crack sealing; and signage maintenance, typically repairing 20 to 30 signs each year. This group is also responsible for mowing on airport property, landscaping and irrigation. They also support Stinson Airport with pavement repairs, electrical, and general maintenance. The airfield maintenance group has electricians that are responsible for electrical facilities on the airfield, in the terminal, parking decks, and parking lots. The airfield maintenance group also uses various locations on the Airport to store materials and equipment, as their current site does not contain enough space for all their equipment. Locations include one bay in the West Cargo Building, a portion of Hangar 4, in the terminals, and on the Wright Flyers site, between the M7 and AeroSky MROs. A temporary sprung structure is planned to be erected northwest of the old Cutter Aviation facilities for additional airport maintenance storage.



The Facilities Maintenance group consists of 62 employees responsible for buildings on Airport property. This group provides elevator and escalator maintenance; handles plumbing issues (which accounts for approximately 80 percent of their current workload); maintains and repairs the terminal interior infrastructure and the HVAC and Central Heating and Refrigeration Plant; paints buildings and maintains roofs; maintains the SAT tenant facilities and fire suppression systems. They also help the airfield maintenance group on electrical-related issues occurring in Airport buildings. The building maintenance group is also responsible for the maintenance and repairs of vehicles and equipment, including smaller ARFF vehicles and airport police vehicles. There are two vehicle maintenance bays that can handle four vehicles.

#### 2.7.5 AIRCRAFT RESCUE AND FIRE FIGHTING FACILITIES

The SAT ARFF station is located on the north side of the Airport, 1,700 feet east of the Runway 13L end. The ARFF site, depicted on **Figure 2.7-5**, is approximately 4.3 acres. The station has a footprint of 22,414 square feet and consists of administration offices, equipment storage, living quarters, and training rooms. There are six parking spots for vehicles and trucks. The apron in front of the building has an area of 105,400 square feet. The SAT ARFF station meets Index C standards.

ARFF personnel at SAT provide both airfield and structural emergency response.



Figure 2.7-5: Aircraft Rescue and Firefighting

Sources: Google Earth Pro, 2018 (basemap); WSP USA, 2018 (annotations).

#### 2.7.6 FUEL STORAGE FACILITIES

The primary fuel storage facility at SAT is operated by Allied Aviation and is located on the east side of the airfield, off Wetmore Road, south of the Million Air and Hallmark University facilities, as shown inside the blue dashed line on **Figure 2.7-6**. It consists of two above-ground 420,000-gallon Jet A tanks, built in the late 1980s. Allied Aviation also has a facility south of the fuel farm with office and employee space, which was built in 2017. The fuel tender is located south of the now demolished Nayak building.



Allied Aviation provides fueling services to commercial aircraft and other SAT tenants. There is no underground fuel hydrant system at SAT, and all aircraft fueling is performed with trucks.

Figure 2.7-6: Primary Fuel Facility Location



Sources: Google Earth, 2019 (basemap); WSP USA, 2019 (annotations). Sources: Tenant Interviews, 2018; WSP USA, 2018.

Secondary fuel storage tanks exist on individual tenants' leaseholds but were not identified for the purposes of this inventory.

**Table 2.7-1** lists the current fuel storage capacity, by fuel type and number of tanks, of the primary fuel tanks at SAT. All tanks are located above ground. The fuel storage facility receives approximately 45 8,000-gallon deliveries daily, each Monday through Friday, with additional deliveries on Fridays to have sufficient fuel through the weekend.



**Table 2.7-1: Primary Fuel Storage Tanks** 

TANK TYPE	NUMBER OF TANKS	TANK CAPACITY (GALLONS)
Jet A	2	420,000
Diesel	1	10,000
Gasoline	1	10,000
Avgas	1	10,000
Sump	1	1,000

Sources: Tenant Interviews, 2018; WSP USA, 2018.

**Table 2.7-2** shows the number of fuel tanker trucks Allied Aviation operates at SAT, by fuel type and tanker capacity.

**Table 2.7-2: Primary Fuel Tanker Trucks** 

TANKER TYPE	NUMBER OF TANKERS	TANKER CAPACITY (GALLONS)
Jet A	4	10,000
Jet A	2	8,000
Jet A	5	7,000
Jet A	3	5,000
Jet A	1	3,000
Gasoline	1	4,200
Gasoline/Diesel	1	2,000
Diesel	1	1,000

Sources: Tenant Interviews, 2018; WSP USA, 2018.

Secondary fuel storage tanks exist on individual tenants' leaseholds but were not identified for the purposes of this inventory.

#### 2.7.7 AIRCRAFT MAINTENANCE, REPAIR AND OVERHAUL FACILITIES

Multiple MROs are located on the airfield to serve the both commercial airlines and general aviation, as shown in red shading on **Figure 2.7-7**.

VT SAA is located on the west side of the airfield off John Saunders Road. VT SAA is an MRO for commercial aircraft, but it also provides completion services for private aircraft, and perform upgrades to aircraft systems and cabins. VT SAA has an engineering firm that oversees the project and certification process. VT SAA typically redelivers between 160 and 200 aircraft each year. The main hangar was originally three separate hangars that were eventually combined into one continuous hangar. The site



contains five hangars, with one hangar dedicated to VIP services. VTSAA also uses the apron adjcent to Terminal B for remote aircraft parking,

Textron Aerospace

Aerospace

SkyPlace Boulevard

Aviation

Aero Sky

Aero Sky

Figure 2.7-7: Aircraft Maintenance, Repair and Overhaul Facilities

Sources: Google Earth Pro, 2018 (basemap); WSP USA, 2021 (annotations).

M7 Aerospace is located off Skyplace Boulevard and has multiple buildings that make up the M7 Aerospace campus. The facilities include office space, storage and maintenance hangars. Hangar 11, which is well-utilized, is 44,500 square feet. There are two administration buildings that are 20,000 square feet and 50,000 square feet. The main offices are in the smaller of the two buildings. M7 Aerospace is planned to start occupying additional facilities adjacent to their existing facilities in 2021. M7 Aerospace was previously Fairchild Dornier Aviation, and is currently a subsidiary of Elbit Systems. M7 Aerospace provides sustainment and support solutions for the military. They also provide MRO services for a variety of aircraft, as well as support for the Swearingen Metro Merlin, which was produced on their current site.

Aero Sky is located on the northeast portion of the airfield off Skyplace Boulevard. The site contains an 8,300-square-foot office building and a 17,930-square-foot hangar. Aero Sky is an MRO that handles mainly international air carrier aircraft, up to the Boeing 747.

Textron Aviation is located off Skyplace Boulevard on the north side of the airfield. Textron Aviation specializes in maintenance and repair of Cessna, Beechcraft and Hawker aircraft. It originally only offered maintenance and repair of Cessna aircraft, but expended its services when Cessna was bought by Textron,



Inc. Currently, the largest aircraft the facility services is the Cessna Latitude. The location has a 60,680 sq.ft. facility, built 21 years ago, that includes both office and workshop space, with a fuel farm on-site.

Cutter Aviation has been located at SAT since 1998 and specializes in maintenance and sales of TBM, HondaJet, Piper, and Pilatus aircraft. In October 2020, Cutter Aviation moved to the redeveloped Hawker Beechcraft campus. The SAT Cutter facilities are the only Cutter facilities in the U.S. to not provide fuel and FBO services. The old Cutter Aviation facilities are located northwest of the airfield, on Sandau Road. The facilities are located adjacent to the Running M Hangar Services, with shared ramp access to Taxiway H. The old Cutter Aviation facilities are available for redevelopment.

#### 2.7.8 FEDERAL AVIATION ADMINISTRATION FACILITIES

### **AIR TRAFFIC CONTROL FACILITIES**

The ATCT is located adjacent to the CONRAC. It was built in 1986 with a top elevation of 240 feet AGL. The air traffic controllers' eye level is 200 feet AGL. The ATCT provides air traffic services, such as authorizing landings and takeoffs, controlling aircraft transitioning through SAT's airspace, and controlling ground traffic at SAT, including airport ground vehicles. The ATCT building also houses a TRACON station and accommodates FAA Terminal Operations. **Figure 2.7-8** shows the location of the SAT ATCT.

Control Tower Facilities

Cantrol Tarfic Control Tower Facilities

Passenger Terminals

Parking Garage

Figure 2.7-8: Air Traffic Control Tower

Sources: Google Earth Pro, 2018 (basemap); WSP USA, 2018 (annotations).



#### REMOTE TRANSMITTER/RECEIVER

The Remote Transmitter/Receiver (RTR) is an air-to-ground communication system allowing radio communications between pilot and ATC personnel. There are three RTRs at SAT, shown on **Figure 2.7-9**: RTR-F is located north of Skyplace Blvd, RTR-E is located north of the engine run-up enclosure, and RTR-D is located south of the Cargo Area, along Wetmore Rd.

A study is underway to relocate RTR-F, to mitigate interference resulting from proposed FBO development nearby. The tentative relocation site is near RTR-E.



Figure 2.7-9: Remote Transmitter/Receiver Antennas

Sources: Google Earth Pro, 2019 (aerial image); WSP USA, 2020 (annotations).

#### 2.7.9 AIRLINE CATERING FACILITIES

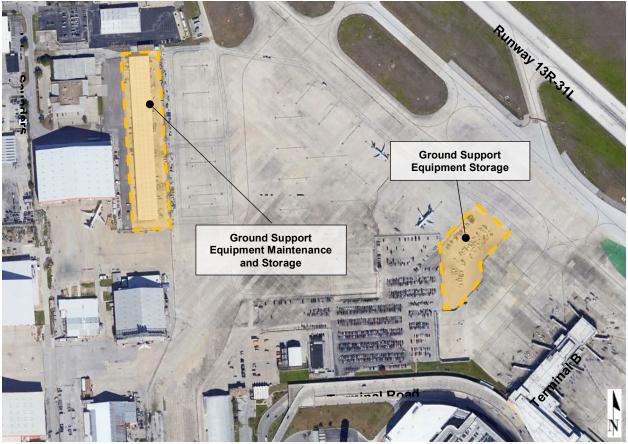
Gate Gourmet Catering Services operates an off-airport flight kitchen located on Isom Road. They provide in-flight catering for passenger airlines serving the Airport.



# 2.7.10 GROUND SUPPORT EQUIPMENT STAGING, STORAGE AND MAINTENANCE FACILITIES

Airlines serving SAT conduct GSE maintenance in the West Cargo Building, adjacent and west of the West Ramp, located on John Saunders Road. This facility is also used for belly-cargoother uses (belly cargo, concessions commissary, airport maintenance storage, ...). GSE staging takes place around the aircraft parking positions, and GSE storage takes place in the GSE maintenance facility and on the apron, between Terminal B and the West Ramp, as depicted on **Figure 2.7-10**.

Figure 2.7-10: Ground Support Equipment Maintenance and Storage Facilities



#### Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).

#### 2.7.11 ELECTRICAL VAULT

The Airport has an electrical vault located in Building 1212, by the West Ramp, depicted on Figure 2.7-11.



Figure 2.7-11: Electrical Vault



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).

### 2.7.12 WASTE DISPOSAL FACILITIES

A triturator is located west of the southern tip of Terminal A, in Building 2403. It allows for disposal of airplane lavatory waste. A trash compactor is adjacent to the triturator, in Building 2402. Both facilities are depicted on **Figure 2.7-12.** 

Figure 2.7-12: Waste Disposal Facilities



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).



#### 2.7.13 CENTRAL HEATING AND REFRIGERATION PLANT

The Central Heating and Refrigeration Plant is depicted on **Figure 2.7-13**. It was built in 2009, and is modular, should it require to be relocated to allow for terminal expansion.

Figure 2.7-13: Central Heating and Refrigeration Plant



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).

#### 2.7.14 GROUND RUNUP ENCLOSURE

**Figure 2.7-14** depicts the existing ground runup enclosure (GRE). Aircraft maintenance run-ups are performed regularly in this facility for testing aircraft engines. Because of jet blast velocities and noise that they generate, high-power run-ups need to be performed at special facilities. The GRE is located at the intersection of Taxiway R and Taxiway N, and covers an area of 80,000 square feet. It is over 250 feet deep and the lateral walls are separated by 248 feet. Consequently, this facility can geometrically accommodate any Group V aircraft with a 15-foot wingtip clearance<sup>1</sup>.

VT SAA, the largest MRO at SAT, uses the GRE for high-power run-ups at least once a week, for aircraft as large as the Boeing 747-400. The MRO wishes to accommodate the Boeing 747-8.

<sup>&</sup>lt;sup>1</sup> Aircraft length might be limited by other factors such as the minimum standoff distance with the jet blast deflectors.



Figure 2.7-14: Run-Up Engine Facility



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).

### 2.7.15 COMPASS ROSE

A compass rose, also known as Compass Calibration Pad, is located between the two parallel runways, and is accessible from Taxiway A, as depicted on **Figure 2.7-15**. The rose itself is 160 feet wide and located 434 feet away from the edge of Taxiway A's pavement.

Figure 2.7-15: Compass Rose



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).



#### 2.7.16 ISOLATION PAD

Two locations at SAT are used as an isolation pad, as needed: the GRE and Taxiway N, between Taxiways N6 and N7, as depicted on **Figure 2.7-16.** 

Figure 2.7-16: Isolation Pad



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2021 (annotations).

#### 2.7.17 AIRPORT PERIMETER FENCE AND SECURITY GATES

Perimeter fencing at an airport prevents both unlawful intrusions onto the Air Operations Area (AOA) and wildlife incursions. Requirements on perimeter fencing for certified airports are provided by Title 14 of the CFR (referred to as 14 CFR) Part 139 on *Airport Certification* and 49 CFR Part 1542 on *Airport Security*. In particular, 14 CFR Part 139.335 specifies that "each certificate holder must provide fencing that meets the requirements of applicable FAA and TSA security regulations in order to prevent inadvertent entry to the movement area by unauthorized persons or vehicles." Technical standards on fencing, video surveillance and detection systems are published by the TSA in the *Airport Security Design and Guidelines* and by the FAA in AC 150/5370-10H on *Airport Construction Standards* (Part 10 on Fencing).

The SAT AOA is entirely protected by perimeter fencing. Based on the TSA's *Airport Security Design and Guidelines*, chain link fences are typically 7 feet tall with one or more coils of stranded barbed wire on top, which may be angled outward at a 45-degree incline from the airside. Other types of fencing (e.g. vertical bar fencing) and alternate means are described. The March 2016 FAA Part 139 CertAlert on *Recommended Wildlife Exclusion Fencing* recommends a 10-foot-tall fence with 3-strand barbed wire

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



outriggers. In some cases, an airport may be able to use an 8-foot fence with 3-strand barbed-wire outriggers, depending on the level of deer activity in a local area. A visual check of the perimeter fencing at SAT reveals sections with low fences that may not meet the TSA 7-foot or FAA 8-foot design standards. However, the newest section of perimeter fencing is fully compliant with the FAA and TSA standards and recommendations. SAAS has hired a consultancy firm (RS&H) to conduct a perimeter fence assessment, to be completed in 2019.

The perimeter fence has multiple gates providing AOA access to airport personnel, tenants and contractors. Most of these gates are on facilities or lots leased to airport tenants. These gates are open to pedestrians, vehicles or aircraft. Access control is based on positive locking device, automated access control system, or electric gates with or without monitoring by security staff. Additionally, there are crash gates with locks that break when collided by vehicle bumpers, providing immediate access to the airfield for emergency services.

#### 2.7.18 VACANT FACILITIES

Vacant facilities are listed below and depicted on Figure 2.7-17:

- Building 1850
- Buildings 1020 and 1021: former Cutter Aviation facilities
- Hangars in the new Premier Aeronautique complex



Figure 2.7-17: Vacant Facilities



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2020.

## 2.8 LANDSIDE FACILITIES

Landside facilities provide airport access, automobile parking and rental car facilities.

### 2.8.1 AIRPORT ROADWAY ACCESS

#### **ROAD NETWORK**

SAT is situated near major highways and centrally located to serve the CoSA and the regional population. Access is convenient with direct connections to an interstate and a major highway, Loop 410 and U.S. Highway 281. A third controlled-access facility nearby, Wurzbach Parkway, connects to U.S. Highway 281. The Airport is also served by a system of arterials and collector streets. The surrounding road network is described below.



### **MAJOR THOROUGHFARES**

### Loop 410

Loop 410 is part of the Interstate system and is under the jurisdiction of Texas Department of Transportation (TxDOT). As an interstate highway, Loop 410 is a controlled-access facility with main lanes, frontage roads and ramps. As a circular facility, Loop 410 provides east-west and north-south travel with connections to regional highways, Interstate Highway (IH)-35, IH-10, U.S. Highway 281, and Wurzbach Parkway. Near the Airport, Loop 410 has nine to ten total main lanes, with a posted speed limit of 65 miles per hour (mph). Elevated ramps provide direct connections between Loop 410 and U.S. Highway 281 near the Airport.

### U.S. Highway 281

U.S. Highway 281 is a north-south controlled-access facility that runs through most of San Antonio. On the far north side of the city, the frontage roads and ramps are absent and signalized intersections are introduced. However, a project to widen U.S. Highway 281, add frontage roads, main lanes and ramps between North Loop 1604 and Marshall Road, is currently under construction. The airport is bounded by U.S. Highway 281 on the west side. An elevated ramp provides direct access from northbound U.S. Highway 281 main lanes to the airport parking and terminals. Southbound U.S. Highway 281 traffic exits to the frontage road to an elevated overpass and a signalized intersection with Dee Howard Way. Traffic exiting the Airport can access both directions of U.S. Highway 281 via the frontage roads using Dee Howard Way. Near the Airport, U.S. Highway 281 has four main lanes in each direction with a posted speed limit of 65 mph.

### Wurzbach Parkway

Wurzbach Parkway is an east-west thoroughfare connecting IH-35 at its east terminus to just past Bandera Road at its west terminus. Wurzbach Parkway is a controlled-access facility that converts to a non-controlled-access facility, just east of NW Military Highway. Wurzbach Parkway is under TxDOT jurisdiction from IH-35 to Lockhill-Selma Road, where it converts to CoSA jurisdiction and is known as Wurzbach Road. In October 2015, the final section of Wurzbach Parkway between Blanco Road and east of U.S. Highway 281 was completed. Wurzbach Parkway borders a portion of the Airport's boundary along the north side, which has increased traffic in the area and added entrances/exits to the northern Airport areas. Near the Airport, Wurzbach Parkway has three lanes in each direction and a posted speed limit of 60 mph.

#### ROADWAYS SERVING THE AIRPORT

#### Airport Boulevard

Airport Boulevard is a north-south roadway that connects the terminal area with Loop 410, both eastbound and westbound, and with U.S. Highway 281 to and from the south. It also provides access to key locations and services within the Airport. It is typically a four-lane divided roadway with turn lanes at intersections. Signals are present at intersections with the Loop 410 frontage roads, Northern Boulevard, and South Terminal Drive.

The northbound exit from U.S. 281 Highway to Airport Boulevard crosses under the ramps to Loop 410 and then continues northward, passing the Loop 410 frontage road intersections, and into the Airport. The southbound portion of Airport Boulevard starts at the intersection of South Terminal Drive and West Terminal Drive and travels south of the Loop 410 frontage road intersections. Southbound Airport Boulevard becomes elevated south of Parkridge Drive, passing under the Loop 410 connector ramps and over the

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



main lanes of U.S. Highway 281 before dropping down and merging with the southbound U.S. Highway 281 frontage road.

Within the Airport, the northbound portion of Airport Boulevard splits, with one branch extending eastward to join the eastbound portion of South Terminal Drive and the elevated Airport entry ramp to access the terminal curbsides and terminal area parking. The other northbound branch allows private access for FAA designated vehicles via a northbound drive. Public vehicles turn left onto Dee Howard Way at the intersection with South Terminal Drive.

#### South Terminal Drive. Terminal Drive. West Terminal Drive

From northbound Airport Boulevard, all terminal-bound airport traffic turns right onto the ring road, or South Terminal Drive. South Terminal Drive eastbound begins as a three-lane roadway. Traveling eastbound, one lane splits off South Terminal Drive to enter Long-Term Parking, Short-Term Parking, and the CONRAC facilities. Continuing eastbound, the ramps from northbound U.S. Highway 281 merge onto South Terminal Drive just before the road splits to provide two lanes to the lower level for passenger arrivals and baggage claim, and two lanes to the upper level for passenger departures. Airport shuttles and TNC/Taxicab vehicles also split off from Terminal Drive to pick up arriving passengers in the outer lanes of the lower level. Terminal access via the upper and lower levels are provided by North Terminal Drive. Downstream of the terminals, the upper level, lower level, Long-Term Parking, Short-Term Parking, and CONRAC traffic all merge to form West Terminal Drive, which proceeds southbound until the intersection with Airport Boulevard and Dee Howard Way.

Downstream of the terminals on North Terminal Drive, airport employee access to parking (Purple Lot) is provided via a gated entry off of the lanes that service the Lower deck inside lanes for Arrivals. The outside lanes, which are generally utilized only by airport shuttles and TNC/Taxicab pickup, also provides access for CONRAC employees. West Terminal Drive also provides vehicle access to the Airport Police Station and other airport facilities. Airport cargo and shipments mainly access the Airport airside through Gate 20, located upstream of the terminals and of the service road that runs parallel to South Terminal Drive.

### Elevated Airport Entry Ramp

A separate entry to the Airport from U.S. Highway 281 from the south is provided via an elevated, single-lane ramp. This northbound exit off U.S. Highway 281 is located north of the Airport Boulevard exit. Once inside the Airport, the ramp splits between single-lane ramps to either terminal area parking or the terminal curbsides, joining the at-grade roadway connections from Airport Boulevard and South Terminal Drive.

#### Dee Howard Way

Dee Howard Way provides eastbound entry into the Airport from southbound U.S. Highway 281 and westbound exit from the Airport to both northbound and southbound U.S. Highway 281. It is typically a four-lane divided roadway with turn lanes at intersections. Signals are provided at the intersections with Airport Boulevard, John Saunders Road, and the southbound U.S. Highway 281 frontage road. Dee Howard Way provides access to and from the Airport terminal curbsides and terminal parking, as well as tenant facilities and airport Green Lot parking on John Saunders Road.

#### Northern Boulevard

Airport entry and exit are possible at the unsignalized intersection of Northern Boulevard with the northbound U.S. Highway 281 frontage road. Northern Boulevard is a two-lane undivided roadway providing

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



access to the Airport's Green Lot Economy Parking, Taxicab staging (Orange Lot) and TNC vehicle staging, as well as general aviation facilities. Northern Boulevard also provides access to a recently completed gasoline station/convenience market/fast food restaurant with drive-thru service, as well as the new location for the cell phone lot. The intersection of Northern Boulevard with Airport Boulevard is signalized.

#### John Saunders Road

John Saunders Road is a short north-south road fully located within the Airport property. North of the signalized intersection with Dee Howard Way, it provides access to Employee Parking and tenant uses. South of Dee Howard Way, it provides access to public parking (Green Lot). John Saunders Road is a two-lane roadway with turn lanes provided at Dee Howard Way.

#### ADDITIONAL SURROUNDING ROADWAYS

Roadways providing access to other parts of the Airport (cargo areas, maintenance areas, and other tenants) include Jones Maltsberger Road, Isom Road, Sandau Road, and East Nakoma Drive on the west, and Wetmore Road and Starcrest Drive on the east. These roadways range from four-lane divided roadways to two-lane undivided roadways and are described briefly below.

Wetmore Road is a northeast-southwest oriented roadway extending from North Loop 410 to just north of Thousand Oaks Road. Wetmore Road abuts the east limit of the Airport, between Wurzbach Parkway and North Loop 410 frontage road. The intersection with Wurzbach Parkway is a grade-separated T-intersection with Wetmore Road traveling beneath Wurzbach Parkway. Wetmore Road is typically a four-lane undivided roadway except at Wurzbach Parkway, where a median is introduced. Signals control the intersections at Broadway Street, MacArthur View and the ramps for Wurzbach Parkway. The Union Pacific Railroad line abuts the east right-of-way of Wetmore Road. The posted speed limit on Wetmore Road is 45 mph.

Nakoma Drive extends from West Avenue to Jones Maltsberger Road. It crosses above U.S. Highway 281, becoming East Nakoma Drive and intersecting with the frontage roads. Near the Airport, East Nakoma Drive has two lanes in each direction and a posted speed limit of 40 mph.

Johns Maltsberger Road is split by the Airport runways. It begins at East Basse Road, south of Loop 410 and continues north, crossing Loop 410 and U.S. Highway 281 to the intersection with Sandau Road and Isom Road on the south side of the Airport. Jones Maltsberger Road picks up on the north side of the runways at East Nakoma Drive, continuing northeast to Bulverde Road. Near the Airport, Jones Maltsberger Road has two lanes between Loop 410 and Sandau Road, and a posted speed limit of 35 mph.

Isom Road extends from its south terminus at San Pedro Avenue, northeast to U.S. Highway 281, where it crosses above the main lanes, then continues to Sandau Road. Isom Road has four lanes from San Pedro Avenue to Ramsey Road. East of Ramsey Road, it has two lanes and a center two-way left-turn lane to U.S. Highway 281. It narrows to two lanes and lacks curbs from U.S. Highway 281 to Jones Maltsberger Road. The posted speed limit is 35 mph.

Sandau Road is about one-half mile in length, extending east from U.S. Highway 281 to its terminus at the intersection with Isom Road/Jones Maltsberger Road. Sandau Road has two lanes and a posted speed limit of 35 mph.

Skyplace Boulevard provides access to hangars on the far north side of the Airport, traveling east and west from the signalized intersection with East Nakoma Drive/Gordon Road. Skyplace Boulevard has two lanes and a posted speed limit of 30 mph.

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



Starcrest Drive is an east-west roadway intersecting Wurzbach Parkway at its east terminus. From there, it extends west to Stuntman Road, where it changes to Bitters Road, eventually connecting to U.S. Highway 281. Starcrest Drive is a four-lane divided road between Wurzbach Parkway and Budding Boulevard, where it widens to five lanes (four lanes with a two-way left-turn-lane) until Jones Maltsberger Road, and then reverts to a four-lane divided road to Stuntman Road.

**Table 2.8-1** summarizes the area roadway information.

Table 2.8-1: Airport Area Roadways

ROAD NAME	LIMITS	NUMB ER OF LANES	POSTED SPEED LIMIT (IN MPH)
Loop 410 (EB)	Broadway Street to Wetmore Road	6	65
Loop 410 (WB)	Broadway Street to Wetmore Road	4	65
Loop 410 (EB)	Wetmore Road to U.S. 281	4	65
Loop 410 (WB)	Wetmore Road to U.S. 281	5	65
Loop 410 (EB)	U.S. 281 to Jones Maltsberger Road	5	65
Loop 410 (WB)	U.S. 281 to Jones Maltsberger Road	4	65
Loop 410 (EB)	Jones Maltsberger Road to McCullough Avenue	5	65
Loop 410 (WB)	Jones Maltsberger Road to McCullough Av Avenue	4	65
U.S. 281 (NB)	Isom Road to Sandau Rd Road	4	50
U.S. 281 (SB)	Isom Road to Sandau Road	4	50
U.S. 281 (NB)	Jones Maltsberger Road to Isom Road	4	65
U.S. 281 (SB)	Jones Maltsberger Road to Isom Road	3	65
U.S. 281 (NB)	Sandau Road to E. Nakoma Drive	4	65
U.S. 281 (SB)	Sandau Road to E. Nakoma Drive	4	65
U.S. 281 (NB)	Sunset Road to Jones Maltsberger Road	3	65
U.S. 281 (SB)	Sunset Road to Jones Maltsberger Rd Road	3	65
Wurzbach Parkway (WB)	U.S. 281 to Wetmore Road	3	60
Wurzbach Parkway (EB)	U.S. 281 to Wetmore R Road d	3	60
Airport Boulevard	U.S. 281 to Loop 410	4	30
Airport Boulevard	Loop 410 to Dee Howard Way	6	30
Dee Howard Way	U.S. 281 to Airport Boulevard	4	30
Isom Road	U.S. 281 SBFR	2 + (1- TWLT)	35

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



Isom Road	U.S. 281 NBFR to Jones Maltsberger Road	2	35
Jones Maltsberger Road	Loop 410 WBFR to Isom Road	2	35
East Nakoma Drive	U.S. 281 to Jones Maltsberger Road	4	40
Northeast Entrance Road	Northeast Entrance Road	2	30
Sandau Road	Isom Road to U.S. 281 NBFR	2	35
Skyplace Boulevard	East Nakoma Drive to cul-de-sac	2	30
South Terminal Drive	Airport Boulevardto E Terminal Drive		15
East Terminal Drive (lower)	South Terminal Drive to North Terminal	2	15
North Terminal Drive (upper)	East Terminal Drive to Terminal Boulevard	3	15
Terminal Boulevard	North and East Terminal Boulevard to Airport Boulevard	8 to 5	25
Wetmore Road	Loop 410 to Wurzbach Parkway	4	45

Notes:

EB - eastbound

NB - northbound

SB - southbound

TWLT - Two-Way Left-Turn Lane

WB - westbound

FR - frontage road

Source: WSP USA, 2018

#### TRAFFIC VOLUMES

Traffic volumes in and around the Airport site were counted and analyzed to determine existing interactions of travel patterns during the peak hours for Airport users and adjacent street users. Traffic counts were categorized into one of two groups: internal airport traffic and external street traffic. Critical intersections and freeway access ramps for both on-site and off-site locations were identified for observation and analysis. Locations that were off-site were observed and counted on May 8, 2018, during the school year, and identified peak hour traffic for off-airport activity. On-site locations were observed during peak airport activity, being the highest air traffic week of the year, from June 8 to June 14, 2018.

Two classes of information were gathered to study on- and off-site activity: 24-hour pneumatic tube counts, and Turning Movement Counts (TMCs). TMCs were collected for off-site locations from 7:00 am to 9:00 am (morning peak hour) and from 4:00 pm to 6:00 pm (evening peak hour). For on-site locations, TMCs were adjusted to capture peak hours that corresponded to peak flight activity. The morning peak hours were observed from 4:00 am to 7:00 am, with the evening peak hours observed from 8:00 pm to 11:00 pm. 24-hour tube counts were collected for off-site traffic from 12:00 am on May 8, 2018 to 11:59 pm on the same date. 24-hour tube counts for on-site traffic were collected from 12:00 am on June 8, 2018 to 11:59 pm on the same date.

**Figure 2.8-1** and **Figure 2.8-2** depict where traffic counts were collected in June 2018. **Appendix 2D** details traffic counts locations and results.



Figure 2.8-1: Traffic Count Locations by Type

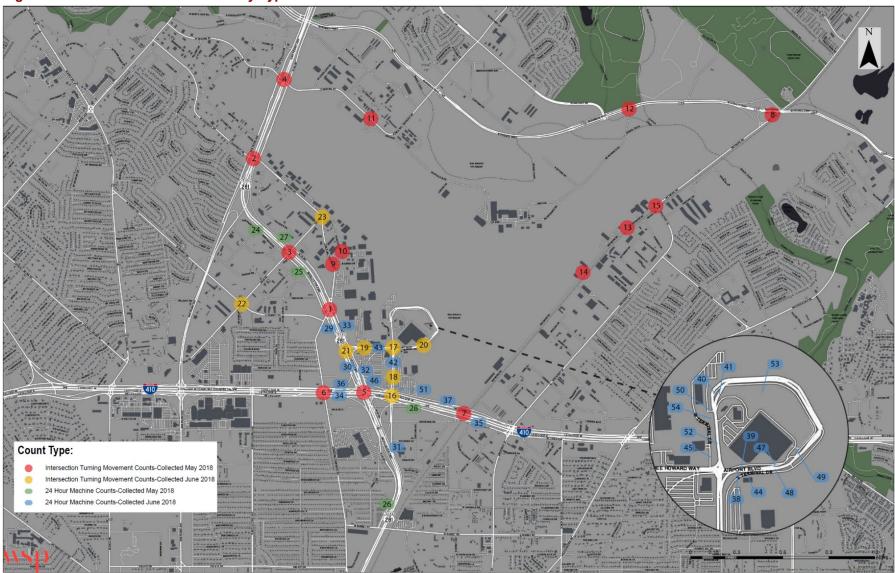
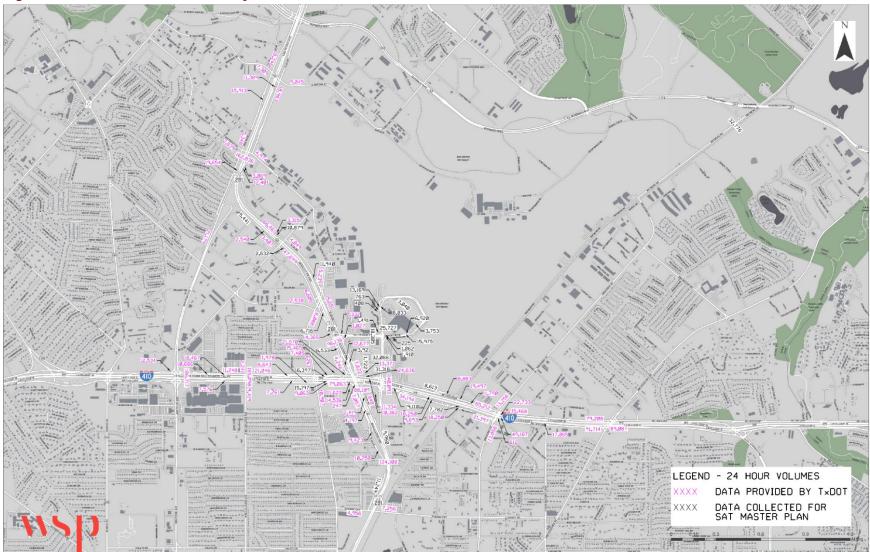




Figure 2.8-2: 24-Hour Traffic Counts by Location



# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



#### **CRASH DATA**

Crash data for the road network within and surrounding the Airport was obtained from the database maintained by the Alamo Area Metropolitan Planning Organization (AAMPO). Year 2016 crashes were mapped using GIS and showing severity of injury on **Figure 2.8-3**.

Injury crashes were classified as fatal, incapacitating, non-incapacitating, possible injury, not injured and unknown. Intersections in the Airport experiencing the greatest frequency of crashes include Airport Boulevard at Dee Howard Way, and the curbside areas in front of the terminals. U.S. Highway 281 and North Loop 410 frontage road intersections display significant amounts of crashes, which is not unexpected since traffic volumes are very high in those locations.

Some lower volume intersections with high crash frequencies occur at intersections along Wetmore Road with Wurzbach Parkway, as well as Broadway and MacArthur View.

#### INTERSECTION OPERATIONS ANALYSIS

Study area intersection geometry, lane assignments, posted speed limits, signal timings, and turning movement counts were coded into a traffic engineering software program, Synchro/SimTraffic (Version 9). This software is used to evaluate the performance of signalized and unsignalized intersections. The analysis is typically performed for the peak period operational conditions. Corridor and intersection geometry was derived from field observations performed in July 2018, as well as utilizing aerial imagery captured in January 2018.

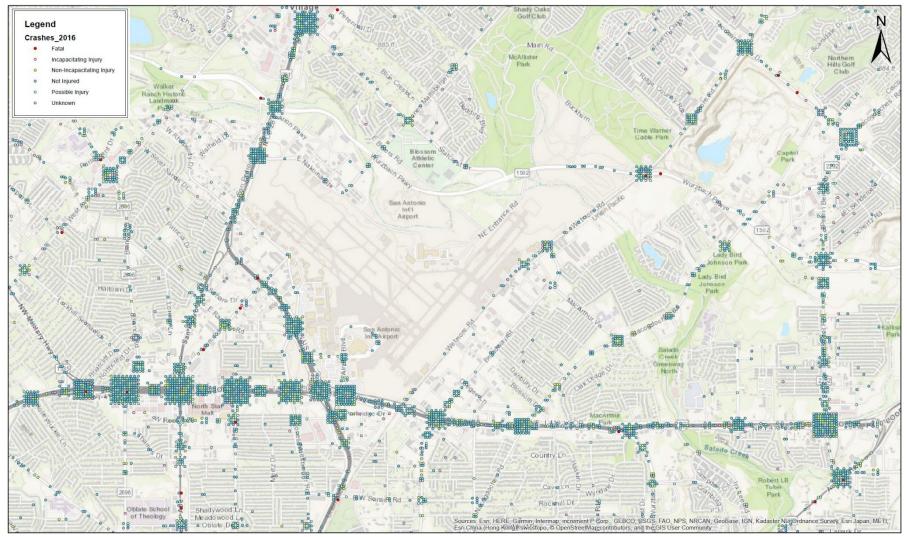
Signal timings, provided by the CoSA, were translated and input into Synchro. Intersection turning movement counts, peak hour factors, and heavy vehicle percentages were collected by WSP in either May 2018 (off Airport, during the school year) or June 2018 (on Airport, during peak travel for summer vacation).

Level of Service (LOS) is a qualitative measure based on quantitative methods of measuring traffic delay and congestion. It is commonly used to analyze and compare highway performance and categorize traffic flow into grades "A" through "F", which represent varying levels of how efficiently traffic is served on that highway or intersection. Many factors go into the determination of LOS for a given highway, or intersection, including geometry, signal timing characteristics, traffic volumes, and other roadway features. LOS grades are described below:

- LOS A: Free flow conditions. Traffic flows at or above the posted speed limit. Motorists have complete mobility between lanes and there is a high level of comfort in driving.
- LOS B: Reasonably free flow conditions. While LOS A traffic speeds are maintained, there is more
  restricted maneuverability between lanes. Motorists generally still have a high level of comfort in
  navigating the traffic conditions.
- LOS C: Stable flow. With minor reductions in traffic speeds, maneuverability between lanes is more
  restricted and lane changes require high driver awareness. Experienced motorists remain
  comfortable with the driving task. Some delay occurs at intersections.
- LOS D: Approaching unstable flow. Traffic speeds decrease as traffic volume increases. Maneuverability between lanes is much more restricted and driver comfort is significantly decreased. Minor incidents are expected to create delays. Delay at intersections is beginning to become significant for drivers.



Figure 2.8-3: Area Crashes by Severity of Injury – 2016 Crash Data





- LOS E: Unstable flow. Roadways are operating at capacity, with virtually no gaps between vehicles.
   Any disruption to traffic flow, including ramp merges or minor incidents will have shockwave effects on traffic and create significant delays. Intersections experience significant delay.
- LOS F: Overcapacity. "Stop-and-go" traffic results in high density of vehicles on the roadway. It results in very limited maneuverability between lanes, significantly reduced traffic speeds, and travel time cannot be predicted. Heavy queuing and delays occur at intersections.

Table 2.8-2 shows the average intersection delays associated with each LOS category.

Table 2.8-2: Level of Service Criteria for Intersection Lane Groups

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (SEC/VEH)				
	UNSIGNALIZED INTERSECTIONS	SIGNALIZED INTERSECTIONS			
Α	0-10 sec/veh	0-10 sec/veh			
В	10-15 sec/veh	10-20 sec/veh			
С	15-25 sec/veh	20-35 sec/veh			
D	25-35 sec/veh	35-55 sec/veh			
E	35-50 sec/veh	55-85 sec/veh			
F	50+ sec/veh	85+ sec/veh			

Notes : Sec – seconds

Veh - vehicle

Source: WSP USA, 2018.

**Table 2.8-3** and **Table 2.8-4** show the LOS and Delay analysis results for signalized and unsignalized intersections. At signalized intersections, the overall LOS and delay are reported in Table 2.8-3. Where unsignalized intersections are controlled by stop signs on the side street and the major roadway is uncontrolled (Two-Way Stop-Control [TWSC]), only the delay and LOS for the stop-controlled approach are reported. If the intersection has stop signs on all approaches (All-Way Stop-Control [AWSC]), the overall intersection LOS and delay are reported.

The signalized intersections are operating satisfactorily (LOS A through LOS C), except for a few that experience a LOS D or worse, indicating that the intersection is being impacted by delay and congestion. Those intersections operating at LOS D during one or both peak hours include three along the U.S. Highway 281 Northbound frontage road: Wetmore Road, Isom Road, and Nakoma Drive; and two on the Loop 410 frontage roads at Jones Maltsberger Road. Two intersections along Wetmore Road, one at Broadway and one at Wurzbach Parkway are also operating at LOS D.



Table 2.8-3: Level of Service Criteria for Signalized Intersections (May/June 2018)

EXISTING SIGNALIZED INTERSECTION CAPACITY ANALYSIS						
	Morning	g Peak Hour	Afternoon Peak Hour			
Intersection	Level of Servic e	Control Delay (sec/veh)	Level of Servic e	Control Delay (sec/veh)		
Off Airport						
U.S. 281 Northbound Frontage Road at Nakoma Drive*	D	41.9	D	40.9		
U.S. 281 Southbound Frontage Road at Nakoma Drive*	В	18.3	В	18.6		
U.S. 281 Southbound Frontage Road at Rhapsody Drive	В	17.9	В	14.7		
U.S. 281 Northbound Frontage Road at Isom Road*	В	15.1	D	36.3		
U.S. 281 Southbound Frontage Road at Isom Road*	С	23.2	С	22.8		
U.S. 281 Northbound Frontage Road at Jones Maltsberger Road*	С	20.1	D	49.9		
U.S. 281 Southbound Frontage Road at Jones Maltsberger Road*	В	19.8	D	35.5		
U.S. 281 Southbound Frontage Road at Dee Howard Way*	Α	0.3	Α	0.3		
Loop 410 Eastbound Frontage Road at Jones Maltsberger Road*	В	19.5	С	33.9		
Loop 410 Westbound Frontage Road at Jones Maltsberger Road*	В	17.6	В	17.2		
Loop 410 Eastbound Frontage Road at Airport Blvd*	С	34.0	С	27.2		
Loop 410 Westbound Frontage Road at Airport Blvd*	С	25.0	С	32.4		
Wurzbach Parkway Eastbound at Wetmore Road	Α	3.5	С	21.1		
Wurzbach Parkway Westbound at Wetmore Road	С	21.6	D	41.8		
Wetmore Road at Bitters Road*	С	25.9	В	16.5		
Wetmore Road at Broadway Street*	С	26.3	D	41.8		
Nakoma Drive at Skyplace Boulevard*	Α	8.1	В	11.4		
Jones Maltsberger Road at Paul Wilkins Street *	В	11.0	Α	7.3		
On Airport						
Dee Howard Way at John Saunders Road*	Α	8.2	Α	5.2		
Airport Boulevard at Northern Boulevard*	Α	9.5	В	16.5		
Airport Boulevard at Dee Howard Way/Terminal Boulevard*	В	15.0	В	12.2		



Notes:

\* Delay and Level of Service determined by Highway Capacity Manual 2010 methodology

Sec – seconds Veh - vehicle

Sources: WSP USA, Off-Airport Observations, May 2018 (during school year); WSP, On-Airport Observations, May 2018 (during peak travel period for summer vacation, June 2018).

Table 2.8-4: Level of Service Criteria for Unsignalized Intersections

UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS					
Intersection		Morning Peak Hour		Af	ternoon Peak Hour
Condition	Intersection Type	LOS	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)
	Loop 410	Eastboun	d Frontage Road at Wetm	ore Road	l
Existing	AWSC	С	23.1	F	108.2
		Wetmore	Road at DHL Driveway		
Existing	TWSC (EB)	E	47.6	E	36.9
		Wetmore	Road at FedEx Driveway		
Existing	TWSC (EB)	Е	54.7	F	109.0
	Pa	aul Wilkins	s Street at John Cape Roa	ad	
Existing	TWSC (SB)	В	10.6	В	12.4
	U.S. 281 No	rthbound	Frontage Road at Dee Ho	ward Wa	y*
Existing	TWSC (WB)	В	10.6	В	13.4
	U.S. 281 S	outhboun	d Frontage Road at Loop	410 WBF	R
Existing	TWSC (SB)	E	36.2	F	111.6

#### Notes:

\* Delay and Level of Service determined by *Highway Capacity Manual 2010* Two-Way STOP-Controlled methodology AWSC – All-Way STOP-Controlled

LOS - Level of Service

Sec - seconds

TWSC - Two-Way STOP-Controlled

Veh - vehicle

Source: WSP USA, 2018.

Four of the unsignalized intersections are experiencing near or over capacity conditions for traffic on the stop-controlled approach. Two are driveways on Wetmore Road, indicating that heavy volumes on Wetmore Road make it difficult for drivers to find adequate gaps to exit. The remaining two intersections are on Loop 410 frontage roads, Loop 410 Eastbound frontage road at Wetmore Road and Loop 410 Westbound frontage road at U.S. Highway 281.

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



Typically, the *Highway Capacity Manual*<sup>2</sup> (HCM) methodology provides a conservative result for unsignalized intersections since the available gaps in traffic, that correspond to the delay, are estimated.

#### **CUT-THROUGH ANALYSIS**

The Airport is currently located in an area that is surrounded by several land uses, including commercial, industrial, office, and residential. Roadways that are internal to the airport infrastructure are open-access and can be utilized by traffic from any of the surrounding centers of activity. In this context, some traffic is likely to use the internal airport roads as through routes from given origins and destinations that are unrelated to any Airport activity. Such trips are therefore called "cut-through" trips.

Three specific cut-through routes were identified to have the potential to provide for cut-through traffic, as follows:

- Traffic from U.S. 281 Southbound frontage road to Loop 410 Eastbound frontage road utilizing Dee Howard Way and Airport Boulevard.
- Traffic from Loop 410 Westbound frontage road to U.S. 281 Northbound frontage road utilizing Airport Boulevard and Dee Howard Way.
- Traffic using eastbound and westbound Skyplace Boulevard (north side of airport property) to bypass the Wurzbach Parkway and Nakoma Drive interchange.

A license plate video capture study was performed to identify which of the vehicles using Airport Boulevard, Dee Howard Way, Northern Drive, and Skyplace Boulevard drive straight through the airport property without interacting with airport facilities. The video capture was performed over two hours in the morning and afternoon from 7:00 am to 9:00 am and from 4:00 pm to 6:00 pm, to capture peak traffic from unrelated Airport uses. Video cameras were setup at key locations and software identified where license plates matched at several places along the predicted cut-through routes. **Table 2.8-5** identifies each route and demonstrates the total traffic volume that was determined to be cut-through traffic.

<sup>&</sup>lt;sup>2</sup> Transportation Research Board, Highway Capacity Manual, 6th edition, 2010.



Table 2.8-5: Cut-through Traffic Routes and Total Volumes

	TOTAL VEHICLES RECORDED		CUT-THROUGH TRAFFIC		PERCENTAGE CUT-THROUGH TRAFFIC	
CUT-THROUGH ROUTES EVALUATED	7:00 am -9:00 am	4:00 pm - 6:00 pm	7:00 am -9:00 am	4:00 pm - 6:00 pm	7:00 am -9:00 am	4:00 pm - 6:00 pm
Dee Howard Way from U.S. 281 SB to Loop 410 EB	653	1284	92	183	14.1%	14.3%
Northern Blvd from Loop 410 WB to U.S. 281 NB	87	211	28	22	32.2%	10.4%
Skyplace Blvd EB from Nakoma Dr to Wurzbach Pkwy	26	34	3	1	11.5%	2.9%
Skyplace Blvd WB from Nakoma Dr to Wurzbach Pkwy	43	79	1	0	2.3%	0.0%

Notes:

EB - eastbound

NB - northbound

SB - southbound

WB - westbound

Source: WSP USA, 2018.

#### INTERNAL AIRPORT CIRCULATION AND OPERATIONS

Internal airport traffic circulates around a one-way roadway called Terminal Drive, which begins in the eastbound direction at the intersection with Airport Boulevard. Terminal Drive provides access to all Airport terminal activity and much of the parking capacity at the airport. User can access Terminal Drive either from Airport Boulevard, Dee Howard Way, or from flyover ramps that originate from U.S. 281 Northbound main lanes. The first segment of the circulating Terminal Drive is East Terminal Drive, where travelers decide to access parking facilities, car rental facilities (CONRAC), or Terminal access points on the lower and upper decks. TNC (rideshare) traffic utilizes the access provided by East Terminal Drive, while taxicab traffic utilizes a service road parallel to East Terminal Drive.

If travelers are destined for passenger drop-off points, they are directed to the upper level, where curbside drop-off is separated between Terminal A and Terminal B drop-off locations. If travelers are destined for passenger pick-up locations, they are directed to the lower level, where curbside pick-up is split between personal vehicle pick-up, shuttle, TNC (rideshare), and taxicab traffic.

FAA facilities and staff (including the airport tower) have access from northbound Airport Boulevard to an exclusive roadway that extends northbound from the Dee Howard Way/East Terminal Drive intersection. Airport Police and other airport employee offices and parking are accessed via driveways off of the main terminal circulating roadway. Employees of the CONRAC facility and Airport Parking facility also utilize the Terminal Drive circulating roadway for access. Most of these auxiliary facilities are not passenger-related and result in the ancillary traffic related to these facilities to use terminal curbside roadway capacity for access. The use of the curbside roadway capacity by these auxiliary facilities degrades the performance of Terminal Drive from performing its primary purpose of curbside passenger access to the terminals.

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



Operations analysis of all intersections including critical points along terminal access roads are summarized in the *Intersection Operations Analysis* section of this report.

# ALAMO AREA METROPOLITAN PLANNING ORGANIZATION TRAVEL DEMAND MODEL AND DATA

The AAMPO maintains a regional Travel Demand Model (TDM) for traffic projection and forecasting purposes. The TDM receives many input variables, including existing roadway geometry and configuration, population, employment, and land use within small subareas to determine how travel occurs between subareas on a wide, regional scale. Travel Demand Models are commonly used by traffic engineers and planners to identify existing and future roadway performance and where constraints might occur given changes in demographics or land use in future analysis years. The TDM for the AAMPO currently models traffic within the Airport site as one sub-area focused on distributing traffic through the Terminal Drive, Airport Boulevard, and Dee Howard Way facilities. Further Airport ancillary traffic pertains to another subarea, and is distributed to Jones Maltsberger Road and Sandau Road. The TDM algorithm models travel demand from the Airport to land uses across the region, assigning trips to adjacent roadways that provide access, including U.S. 281 and Loop 410.

One common measure for roadway performance is the ratio of roadway volumes (indicating travel demand) to roadway capacity, or V/C. If the resulting V/C ratio is greater than 1.0, the travel demand for a given roadway exceeds the capacity of the roadway to accommodate that travel demand, resulting in congestion and gridlock. A roadway is said to be "At Capacity" if the V/C ratio is between 0.85 and 1.0, and is "Nearing Capacity" if the V/C ratio is between 0.75 and 0.85. To visualize the travel demand of area roadways as they relate to capacity, V/C ratio was mapped in **Figure 2.8-4** for 2015 and **Figure 2.8-5** for the future analysis year of 2040.

### 2.8.2 OFF-AIRPORT AND REGIONAL ACCESS FACILITIES AND PLANS

Regional access is primarily provided by the two major freeway facilities in the area, U.S. 281 and Loop 410. These facilities are restricted-access, meaning access is only provided by one-directional entrance and exit ramps. Primary access to and from the Airport is served by cross street interchanges. The interchanges that provide primary access from U.S. 281 to Airport-related travel are Sandau Road, Isom Road, Jones Maltsberger Road, Dee Howard Way, and Airport Boulevard. Primary access from Loop 410 is through the interchanges at Jones Maltsberger, Airport Boulevard, and Wetmore Road. U.S. 281 and Loop 410 both provide regional access to the Interstate Highway facilities that serve the San Antonio metropolitan region, including central San Antonio and adjacent cities and communities such as Stone Oak, Schertz, Seguin, and New Braunfels.

The City of San Antonio Major Thoroughfare Plan that was adopted in 2016 demonstrates the classifications of roadways in the vicinity of the Airport as they relate to the surrounding roadway infrastructure. In the immediate vicinity of the Airport, San Antonio identifies four roadways that are classified as Arterial: Wurzbach Parkway (a freeway facility), Jones Maltsberger Road, Ramsey Road, and Wetmore Road. Figure 2.8-6 shows the City of San Antonio Major Thoroughfare Plan, and illustrates how the airport falls within the regional roadway infrastructure.



Figure 2.8-4: Area Roadway Congestion in 2015 (Volume-to-Capacity Ratio)

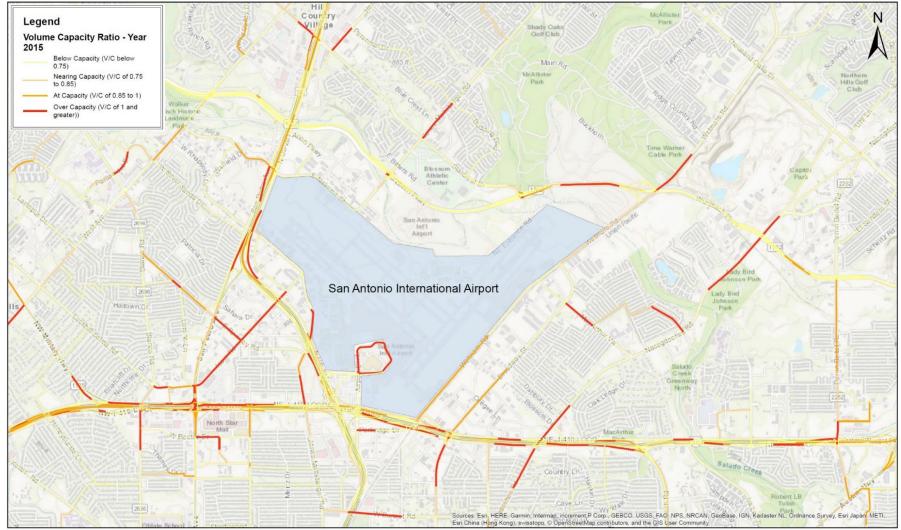




Figure 2.8-5: Area Roadway Congestion in 2040 (Volume-to-Capacity Ratio)

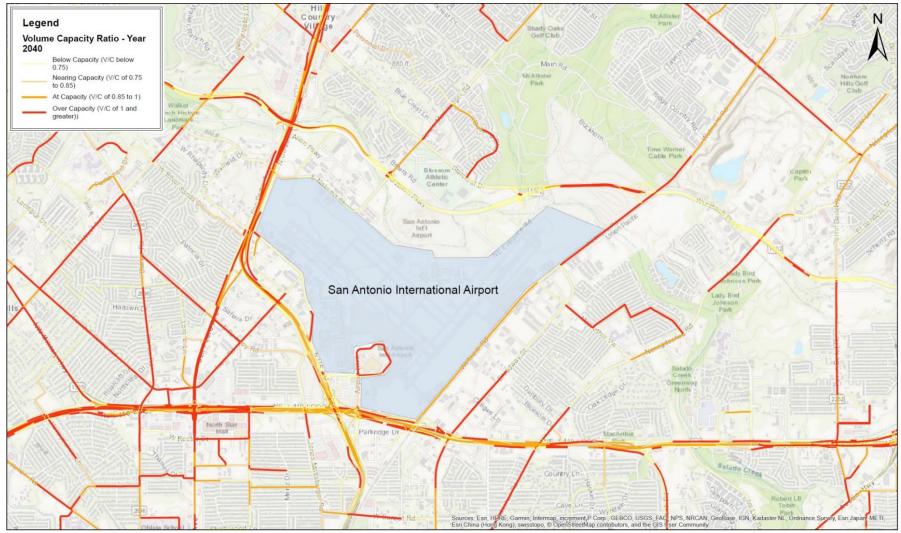
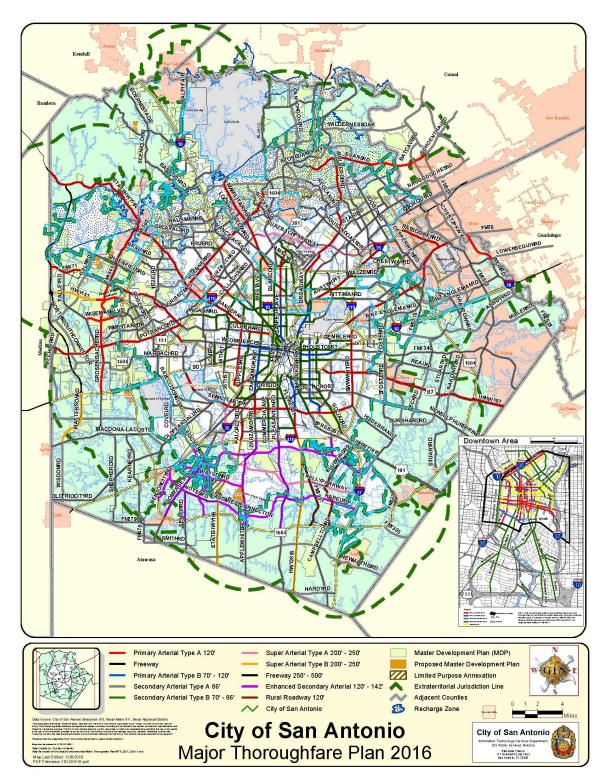




Figure 2.8-6: City of San Antonio Thoroughfare Plan





#### 2.8.3 TRANSIT

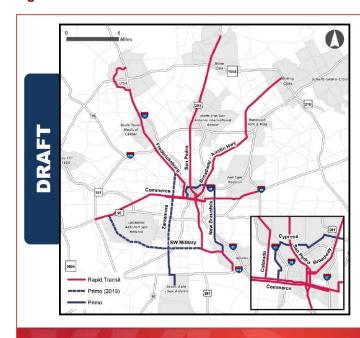
There are a variety of public transportation services to and from the Airport to connect surrounding metropolitan destinations. These services include:

- Public transit
- Taxicabs
- Shuttles and vans
- Ride share

#### **PUBLIC TRANSIT**

VIA Metropolitan Transit (VIA) provides express and local bus service within an extended service area, as shown on **Figure 2.8-7**. At SAT, a designated VIA bus stop is located on the far west end of Terminal B in the lower level. VIA's Route #5 provides access to and from the Airport, connecting with the nearby North Star Transit Center and downtown traveling on McCullough Avenue. North Star Transit Center offers transfers to routes that connect to different major destinations within the city. Route #5 runs between 5:30 am to 10:00 pm with a frequency of 20-30 minutes during peak hours, and otherwise hourly service.

Figure 2.8-7: VIA Vision 2040 Plan



# A Rapid Transit Network Plan will be completed in Fall 2018.

### This plan will:

- List proposed rapid transit projects needed in the region through 2040
- Identify a preliminary implementation schedule
- Integrate rapid transit with existing VIA services

# Implementing the Rapid Transit Network



Source: Via Metropolitan Transit, Rapid Transit Network, 2018.

VIA's Vision 2040 Plan has identified rapid transit corridors to provide frequent express service within a dedicated right-of-way. The service could be Bus Rapid Transit (BRT) or what VIA is calling "trackless rail", an innovative option utilizing new technology. One of the rapid transit corridors, the North-Central Corridor,

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



consists of U.S. Highway 281 to San Pedro to Downtown with a connection shown at the Airport and North Star Transit Center. A Rapid Transit Network Plan was published in March 2019, *VIA Reimagined*.

#### **TAXICABS**

Taxicabs are available on the lower level, at the outer commercial curbside of Terminal A and have a designated pick up area. Taxicabs may drop off passengers on the upper level of Terminal A and B, at the inner curbside. Waiting time for passenger pickup is reduced due to the availability of a taxicab staging area, the Orange Lot, provided at the Airport. The Orange Lot is located on the east side of Airport Boulevard, north of Loop 410.

#### SHUTTLES AND VANS

Airport shuttles provide free rides to and from the terminals and Green/Red surface parking lots, and Long-Term Parking Garage. These shuttles drop off passengers between the two terminals on the upper level at the inner curbside, and pick up from a designated area near Terminal B, at the outer curbside on the lower level.

Private shuttle buses and vans provide airport rides to and from SAT to any address in the metropolitan region and beyond. These services operate 24 hours daily, departing every 15 minutes and include several options such as shared ride, private vans and executive car transportation. Ticket counters for these shuttles are available at the baggage claim area of Terminals A and B. Passenger pick-up and drop off is at Level 0 of the Short-Term Parking Garage.

#### RIDE SHARE

Approved ride share services, also known as TNC or Mobility Service Providers, currently operate within the airport pick-up and drop-off area. These include Uber, Lyft, Get Me and Wingz. TNCs pick up passengers on the commercial outer curbside lower level Terminal A and drop off passengers within designated areas on the inner curbside upper level Terminals A and B for private cars.

#### **OTHER**

Several other services provide transportation to and from the Airport, such as hotel shuttles, limousine services, and charter buses. These services are pre-arranged or available on a frequent schedule.

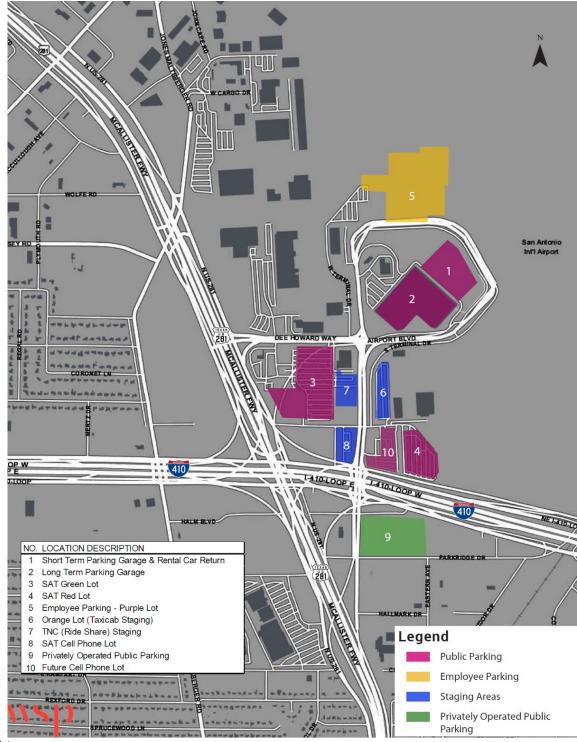
#### 2.8.4 AUTOMOBILE PARKING

#### PARKING INVENTORY

On- and off-site Airport parking is provided for several categories of airport users, including parking for passenger long-term and short-term, Airport employees and staff, taxicab and rideshare staging, and passenger pickup staging. **Figure 2.8-8** illustrates the locations of parking supply relative to Airport roadways and access points.



Figure 2.8-8: Airport Area Parking Supply



Note:

Note #8 Cell lot closed in July 2018.



An inventory of parking lot capacity was provided by the Airport and supplemented by on-site counts where necessary. **Table 2.8-6** summarizes the total capacity of each lot and total Airport parking capacity by use.

Table 2.8-6: On-site and Off-site Inventory of Parking Supply

	involutory or r unkin	
LOCATION	PARKING SUPPLY (NUMBER OF SPACES)	PRIMARY USE
Short-Term Garage	1,221	Passenger pick-up/drop-off & short-duration parking
Long-Term Garage	5,430	Long-term passenger parking & short-term spillover
Long-Term Surface Lots	166	Long-term passenger parking
Green Lot	1,797	Passenger economy parking with daily rates
Red Lot**	550	Passenger economy parking with daily rates
Total SAT Passenger Parking Supply	9,164	
Purple Lot (Employee)	934	Airport employee-only parking
Orange Lot - Taxicab Staging*	297	Staging for Taxicab companies
TNC (rideshare) Staging*	250	Staging for TNC companies such as Uber/Lyft, etc.
Cell Phone Lot 1 (closed July, 2018)	83	Staging for passenger pick-up
Cell Phone Lot 2**	150	Staging for passenger pick-up
Total SAT Parking	10,391	
Airport Security (North)*	835	Privately-operated passenger economy parking with daily rates
Airport Security (South)*	854	Privately-operated passenger economy parking with daily rates
Budget Long Term Parking*	262	Privately-operated passenger economy parking with daily rates
Total Private Passenger Parking*	1,689	
GRAND TOTAL Parking Supply	12,080	

#### Notes:

Source: WSP USA, 2018.

Total passenger parking supply is provided by both Airport-managed and privately-managed entities. Airport-managed lots provide passengers with alternatives for specific passenger needs, including options for long-term, short-term, and economy lots with shuttles to/from the airport terminals. The long-term garage

<sup>\*</sup>Estimated from on-site observation (May, 2018) and aerial imagery (January, 2018) of parking supply.

<sup>\*\*</sup>Red Lot and Cell Phone Lot 2 were not open during the data collection period.



accounts for about 60 percent of the total Airport parking supply, with Green and Red Economy lots accounting for about 25 percent of parking supply.

Off-site and privately-managed airport lots contribute to the parking supply and meeting passenger parking demand. The Airport Security Parking lot is located south of Loop 410 at the intersection of Airport Boulevard and Parkridge Drive, and contains two lots, providing an estimated total of 1,689 spaces. Budget Airport Parking is another privately-managed lot which contains about 262 additional spaces.

Passenger pick-up and drop-off staging is also a major land use for the internal airport site. On-site staging accounts for about 780 total parking spaces across Taxicab, TNC (rideshare) staging, and cell phone lots.

#### **PARKING UTILIZATION**

Utilization of each parking lot was measured through electronic counts at access gates for the Short-Term, Long-Term, Economy (Green), Taxicab (Orange), and Employee (Purple) Lots from June 8 to June 14, 2018. Other lots including the TNC (rideshare) and Cell Phone staging lots were manually counted at 15-minute increments on June 8 from 1:00 pm to 5:00 pm. The data that was received was separated into three main categories: passenger, employee, and pick-up/drop-off staging. The following sections summarize the utilization for each category.

#### PASSENGER PARKING

During the data collection period, total passenger parking occupancy peaked during the weekdays of Tuesday, Wednesday, and Thursday, generally from the noon hours to early evening. Traffic entering and exiting these lots was the heaviest before and after these peak periods. The maximum parking occupancy during the study period occurred on Wednesday, June 13 at 7,166 total vehicles in the Short-Term, Long-Term, and Economy Lots, resulting in a total passenger parking utilization of 83.2 percent. Minimum occupancy for the same lots during the study period occurred in the early morning at 5,656 vehicles for a utilization of 61.6 percent. **Table 2.8-7** summarizes occupancy and utilization for each day during the study period.

**Table 2.8-7: Daily Passenger Parking Utilization Summary** 

DATE	DAY OF WEEK	MAXIMUM OCCUPANCY	MINIMUM OCCUPANCY	AVERAGE DAILY	MAXIMUM UTILIZATION
6/8/2018	Friday	6,433	5,347	6,057	74.7%
6/9/2018	Saturday	5,961	5,194	5,674	69.2%
6/10/2018	Sunday	6,077	5,071	5,646	70.5%
6/11/2018	Monday	7,117	4,772	6,023	82.6%
6/12/2018	Tuesday	7,060	5,576	6,535	82.0%
6/13/2018	Wednesday	7,166	5,970	6,703	83.2%
6/14/2018	Thursday	7,054	5,985	6,608	81.9%
6/15/2018	Friday	6,907	5,747	6,432	80.2%



**Figure 2.8-9** illustrates changes in utilization for each day of the study period. Although the Red Economy Lot was closed during the study period, the spaces in that lot were included in the calculation for utilization, because it contributes to permanent parking supply that can be utilized in the future.

Privately-managed parking lots that were located off-site were not made available for data collection. Parking inventory was estimated as noted in the previous section. Some effort was made to roughly estimate parking occupancy for these lots. For the Airport Security Parking lot, it was estimated that about 95 percent of the north lot and about 50 percent of the south lot were occupied during the observation period of 1:00 pm to 5:00 pm on June 8, resulting in a rough estimate of occupancy of 1,200 vehicles for both lots (about 70 percent utilization). Occupancy and utilization data was not collected for the Budget Parking lot during the study period.

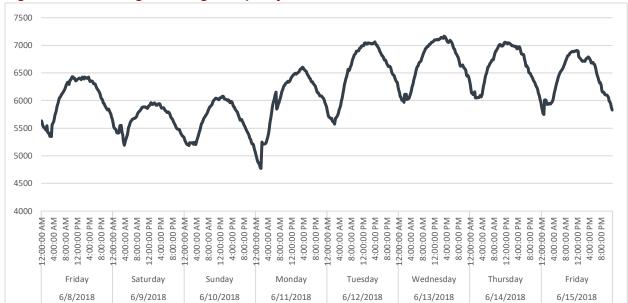


Figure 2.8-9: Passenger Parking Occupancy from June 8 to June 15

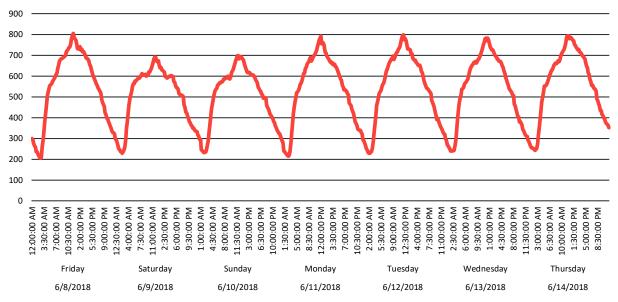
Source: WSP USA, 2018.

#### **EMPLOYEE PARKING**

The Airport provides its employees with the Purple Lot, which is an exclusive lot west of the terminal buildings. Purple Lot utilization follows a very predictable pattern, with maximum occupancy of 86.2 percent, which occurred during the study period on Friday, June 8 at approximately midday. Weekdays are typically higher occupancy, with a maximum of 805 vehicles. On the weekends, maximum occupancy falls to 698 vehicles. Overnight, minimum occupancy is around 200 to 250 vehicles. **Figure 2.8-10** illustrates occupancy of the Purple Lot over the course of the entire study period.



Figure 2.8-10: Employee Parking (Purple Lot) Occupancy from June 8 to June 15



### PASSENGER PICK-UP AND DROP-OFF STAGING

There are three lots that currently stage vehicles for passenger pick-up and drop-off: Orange Lot (taxicab), TNC Lot (rideshare), and Cell Phone Lots. The Orange Lot had electronic transactions that tracked daily occupancy in 15-minute increments for the entire study period. The TNC and Cell Phone Lots were open-access and therefore occupancy and utilization were measured from field counts on June 8, from 1:00 pm to 5:00 pm. For the study period, the taxicab lot had a maximum occupancy of 118 vehicles on a Monday in the early evening. It was observed that this lot had peak occupancy between the hours of 2:00 pm to 6:00 pm with a utilization of about 35 percent to 40 percent Sunday through Thursday, and about 25 percent to 30 percent on Fridays and Saturdays. **Table 2.8-8** shows taxicab lot occupancy and utilization during the study period.

Table 2.8-8: Daily Taxicab (Orange Lot) Parking Utilization Summary

DATE	DAY OF WEEK	MAXIMUM OCCUPANCY	MINIMUM OCCUPANCY	AVERAGE DAILY	MAXIMUM UTILIZATION
6/12/2018	Tuesday	113 (3:00 pm)	3	50	38.0%
6/13/2018	Wednesday	107 (2:30 pm)	4	54	36.0%
6/14/2018	Thursday	108 (4:00 pm)	1	51	36.4%
6/15/2018	Friday	73 (3:30 pm)	4	36	24.6%
6/16/2018	Saturday	82 (1:45 pm)	0	35	27.6%
6/17/2018	Sunday	100 (2:45 pm)	3	45	33.7%
6/18/2018	Monday	118 (6:00 pm)	3	59	39.7%



Data was also collected for the TNC (rideshare) and Cell Phone 1 Lots on June 8 from 1:00 pm to 5:00 pm, and summarized in **Table 2.8-9**. Although the Cell Phone Lot 2 will contribute to the cell phone staging capacity, it was not functional during the data collection period. The TNC Lot currently utilizes an average of 23 percent of capacity, while the Cell Phone Lot utilizes an average of 36 percent of capacity.

Table 2.8-9: Rideshare and Cell Phone Lot Utilization Summary

TIME	RIDESHARE COUNT	RIDESHARE UTILIZATION	CELL PHONE LOT 1 COUNT	CELL PHONE LOT 1 UTILIZATION
1:00 pm	47	18.6%	17	20.5%
1:15 pm	72	28.5%	20	24.1%
1:30 pm	68	26.9%	29	34.9%
1:45 pm	62	24.5%	32	38.6%
2:00 pm	61	24.1%	32	38.6%
2:15 pm	59	23.3%	28	33.7%
2:30 pm	63	24.9%	23	27.7%
2:45 pm	63	24.9%	24	28.9%
3:00 pm	45	17.8%	25	30.1%
3:15 pm	54	21.3%	32	38.6%
3:30 pm	62	24.5%	52	62.7%
3:45 pm	51	20.2%	52	62.7%
4:00 pm	54	21.3%	35	42.2%
4:15 pm	52	20.6%	17	20.5%
4:30 pm	64	25.3%	27	32.5%
4:45 pm	50	19.8%	30	36.1%

Note:

Rideshare represents Transportation Network Companies (TNCs).

Source: WSP USA, 2018.

#### 2.8.5 RENTAL CAR FACILITIES

Rental car facilities are depicted on **Figure 2.8-11.** In 2017, most rental car operations were moved to the CONRAC, eliminating the need for the previously used shuttle buses to several rental car company locations. This 1.8-million square-foot facility accommodates the 13 rental car companies serving SAT. The rental car companies operating at SAT are listed below:

- Advantage Rent-A-Car
- Alamo Rent-A-Car
- Avis Rent-A-Car
- Budget Rent-A-Car

- Dollar Rent-A-Car
- Enterprise Rent-A-Car
- EZ Rent-A-Car
- Fox Rent-A-Car



- Hertz Rent-A-Car
- National Rent-A-Car
- Payless Rent-A-Car

- Sixt Rent-A-Car
- Thrifty Car Rental

The CONRAC has a quick turnaround (QTA) facility that includes fueling, vacuuming, washing and light maintenance. It also has 2,600 ready/return parking spaces. A bridge over the terminal roadway connects the CONRAC to the mezzanine level of the SAT terminal.

Figure 2.8-11: Rental Car Facilities



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2019 (annotations).

Hertz Rent-A-Car still uses a surface parking lot on Jones Maltsberger Road, as a vehicle storage facility, as well as several buildings for maintenance.

# 2.9 OTHER FACILITIES

Other aeronautical and nonaeronautical facilities are depicted on Figure 2.9-1.

Figure 2.9-1: Other Aeronautical and Nonaeronautical Facilities



Sources: Google Earth Pro, 2019 (basemap); WSP USA, 2020.

## 2.9.1 OTHER AERONAUTICAL FACILITIES

Other aeronautical facilities include:

- Flight Safety International, an aircraft ground and simulator training school, located on Airport Boulevard
- Hallmark Aviation, an airframe and powerplant training scholl, which is collocated with Million Air FBO, on Wetmore Road



#### 2.9.2 NONAERONAUTICAL FACILITIES

Nonaeronautical facilities consist of:

- Gas Station/Convenience Store (Building 1410)
- City Brush Facility (Building 1900): north of Skyplace Blvd
- Corner of Sandau Rd and San Pedro Av: vacant parcel with no airfield access
- U.S. Postal Service (USPS): 52,000-square-foot facility located near the West Ramp, west of the West Cargo Building. The USPS facility does not have airfield access.

# 2.10 METEOROLOGICAL DATA

Climate and weather impact aircraft operations at an airport, including the orientation of the runways. Air temperature has an impact on take-off and landing performance, which drives runway length required, while wind direction drives runway(s) orientation. These two factors are analyzed in the following sections.

### 2.10.1 TEMPERATURE ANALYSIS

One of the parameters used to determine the length of the runway is the Mean Daily Maximum Temperature (MMT), which is the average maximum temperature of the hottest month. The data collected by the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) includes Monthly Climatological Summary reports for SAT, which were reviewed to determine the MMT. Through a ten-year period starting from January 1, 2008 to December 31, 2017, the hottest month was August with a MMT of 97.6 degrees Fahrenheit.

#### 2.10.2 WIND ANALYSIS

Wind is a key factor in determining the orientation of the primary runway and potential crosswind runways. The primary runway is oriented in the direction of the prevailing winds. FAA guidance states that the combined airport runways should provide at least 95 percent wind coverage based on 10 years of wind data. Runway wind coverage is determined by computing the percentage of time crosswind components are below an acceptable speed. Acceptable crosswind components differ according the RDC of the runways and are listed in **Table 2.10-1**. Each aircraft type is certified to operate with a maximum crosswind component.



Table 2.10-1: Allowable Crosswind Component Based on Runway Design Code

CROSSWIND COMPONENTS		AIRPLANE APPROACH CODE (AAC)			
		Α	В	С	D
Airplane Design Group (ADG)	I	10.5 knots		16 knots	
	II	13 knots			
	III	16 knots			
	IV	20 knots			
	V			00.1	
	VI			20 knots	

Source: Federal Aviation Administration, Advisory Circular 150/5300-13A Change 1, Airport Design, February 2014.

**Table 2.10-2** summarizes the runway wind coverage at SAT during a period of 10 years, from 2008 to 2017, with crosswind component of 10.5 knots, 13 knots, 16 knots and 20 knots and under VFR, IFR, and All-Weather Conditions. At SAT, the prevailing winds come from the southeast. The RDC of the primary runway, Runway 13R-31L, is D-IV, which has a maximum acceptable crosswind component of 20 knots. As shown in Table 2.10-2, the wind coverage for a crosswind of 20 knots is 99.89 percent for IFR and 99.94 percent for All-Weather conditions. As a result, the primary runway covers more than the 95 percent coverage required by the FAA, except for the crosswind component of 10.5 knots under All-Weather conditions and VFR conditions, when nearly 94 percent of the wind directions are covered. As shown in Table 2.10-1, crosswinds of 10.5 knots apply to A-I and B-I aircraft. The wind roses for these three meteorological conditions and for these crosswind components are shown on **Figures 2E-1** through **2E-12** in **Appendix 2E**.



Table 2.10-2: Wind Coverage for Runways 13R-31L and 13L-31R

CROSSWIND COMPONENTS	ALL WEATHER	INSTRUMENTAL FLIGHT RULES	VISUAL FLIGHT RULES
10.5 knots	94.19%	96.87%	93.87%
13 knots	97.47%	98.53%	97.35%
16 knots	99.53%	99.65%	99.51%
20 knots	99.94%	99.89%	99.94%

Source: National Oceanic and Atmospheric Administration, National Climatic Data Center, San Antonio International Airport, 2007-2017.

### 2.10.3 WEATHER CONDITIONS

Flight visibility and cloud ceiling height can prevent aircraft from operating at an airport. NAVAIDS and instrument procedures help pilots operate the aircraft in poor weather conditions. Two weather conditions apply to general airport operations: Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC). IMC occur when visibility is less than 3 SM and/or cloud ceilings are less than 1,000 feet AGL. Based on the data collected by the NOAA/NCDC, VMC occur at SAT 88.8 percent of the time (including 22.1 percent of marginal VMC), while IMC occurs the remaining 11.2 percent of the time. In the case of SAT, a cloud ceiling of less than 1,000 feet AGL is more prevalent than visibility less than three miles.

# 2.11 ENVIRONMENTAL INVENTORY

This summary provides an inventory of sensitive environmental resources within the SAT study area in support of airport planning. This environmental inventory is presented for applicable resource categories outlined in FAA AC 150/5070-6B - *Airport Master Plans* and FAA Order 1050.1F, *Desk Reference*. The "study area" analyzed in this environmental inventory was defined during the early stages of the process, in coordination with the CoSA. The study area consists of approximately the Airport property line, and encompasses approximately 2,896 acres within San Antonio, Bexar County, Texas, as shown on **Figure 2.11-1**.

Information described below was collected through database searches, imagery analyses, Google Maps and Google Earth, desktop GIS analyses, and review of existing environmental studies provided by SAAS and TxDOT San Antonio District. No field reconnaissance was conducted for the inventory. The online data sources and relevant data used during preparation of this environmental inventory, including figures, are listed in the *Environmental Inventory Technical Report*, presented in **Appendix 2F**.

Figure 2.11-1: Boundaries of the Study Area



Sources: Google Earth Pro, 2018 (aerial imagery); San Antonio Airport System, 2018 (airport property line); Poznecki-Camarillo, Inc., July 2018 (annotations).

**Table 2.11-1** provides a summary of the existing environmental resources in the study area or extended resource area, where applicable. The development plan going forward and associated potential environmental impacts will guide the focus of the environmental resources to be investigated. The primary issues to be addressed in the SDP include air, aquatic resources, hazardous materials, parks, and noise. According to existing environmental reports, biological and cultural resources have not been determined to contain habitat for protected species or eligible sites affording protection, respectively. Once alternatives are developed, analysis will be performed to determine avoidance, minimization and compensation for unavoidable impacts as needed.

The narrative below highlights the primary concerns that deserve attention during the planning process. The remaining detailed descriptions for all resources are found in the *Environmental Inventory Technical Report* (Appendix 2F), prepared for SAAS.



Table 2.11-1: Environmental Constraints of the Study Area

RESOURCE	EXISTING CONSTRAINTS WITHIN THE STUDY AREA
Air Quality	General conformity applicable due to designation of Bexar County as the San Antonio, TX non-attainment area for ozone (effective September 24, 2018)
	Salado Creek and two tributaries, Lorence Creek Mud Creek and a tributary to Olmos Creek within the study area
Aquatic Resources	One NWI wetland in the study area
	100-year floodplain areas within the study area
	Study area within 5 miles upstream and draining into 2 threatened /impaired waters (Salado Creek and Upper San Antonio River)
	Nine historical LPST sites with groundwater contamination are located within the study area
Hazardous Materials and	Fertilizer/Pesticide contamination site located adjacent to study area
Soils	Seven landfill facilities (one operating, six closed) are located within the study area
	Exempt from the requirements of the FPPA and coordination with the NRCS is not required
	No rare or protected vegetation
	Migratory birds may be present in the study area
	Located within Karst Zone 3
Biological Resources	Potential habitat for nine federally-endangered karst species (Bracken Bat Cave Meshweaver, Cokendolpher Cave harvestman, Government Canyon Bat Cave Meshweaver, Government Canyon bat cave spider, Madla's Cave Meshweaver, Robber Baron Cave Meshweaver, Rhadine exilis, Rhadine infernalis, Helotes mold beetle); initial karst features survey required to identify potential habitat
	Potential habitat for one federal candidate plant species (Bracted twistflower)
	Potential habitat for one state-threatened species (wood stork), three state SGCN species (cave myotis bat, tree dodder, Texas garter snake), and six state rare species (western burrowing owl, plains spotted skunk, Big red sage, Correll's false dragonhead, Hill Country wild-mercury, spot-tailed earless lizard)
Socioeconomic Conditions	Portions of study area are considered minority populations
and Demographics	Approximately 7.3 percent of study area consists of LEP individuals
	One fire station within the the study area
Community Resources	Two parks within the the study area
Community Resources	Multiple schools, places of worship, parks, and other community facilities within one mile of the study area
Cultural Resources	Portions of study area contain a high potential for buried prehistoric archaeological resources, especially near Salado Creek
Section 4(f), Section 6(f), and Chapter 26 Properties	Two Section 4(f)/Chapter 26 properties within the study area (McAllister Park and Salado Creek Greenway North)
Noise Sensitive Land Uses/Receptors	Detailed review will occur during the master planning process of alternatives that could have a long-term effect on noise exposure

Sources: Poznecki-Camarillo, Inc., July 2018.



### 2.11.1 AIR QUALITY

Air quality has been an environmental resource concern for SAAS for human health and economic reasons. Local air quality is impacted by meteorological conditions, combined with local and transported emissions outside of the area. According to the Texas Commission on Environmental Quality (TCEQ), San Antonio exceeded the 2015 National Ambient Air Quality Standards (NAAQS) for ozone on May 30, 2018 (SAT 2018). On July 25, 2018, the Environmental Protection Agency (EPA) published a Final Rule (40 CFR Part 81 Federal Register Vol. 83, No. 143), designating Bexar County as the San Antonio, Texas nonattainment area for the establishment of initial air quality designations for the eight counties in the San Antonio-New Braunfels, Texas Core Based Statistical Area for the 2015 primary and secondary NAAQS for ozone. The San Antonio, Texas nonattainment area is classified as Marginal by operation of law according to the severity of the air quality problem. The Final Rule became effective on September 24, 2018.

Based on Nonattainment designation, the state is required to file a State Implementation Plan (SIP) to concentrate on reduction of emissions from major pollution sources within three years of the designation. SAAS will be required to implement the "new source review" program and the General Conformity Program. SAAS is actively working internally and with partners to improve air quality in the area to assist with complying with federal regulations, improving public health, and for continued economic prosperity. SAT developed a Fleet Environmental Policy to help reduce emissions from vehicle pollutants in their Sustainability Plan (SAT 2011). SAAS includes a division focusing on the Air Quality Health Alert Plan (AQHAP) and considering specialized services and goals (Sustainability Plan).

The resource study area for air quality can extend beyond the study area, to include construction and operation of the facility and aircraft, and extend vertically up into the mixing height. Additionally, if the SDP shows increases in passengers and capacity, indirect effects outside of the study area should be considered.

#### **GENERAL CONFORMITY**

General Conformity regulations implement Section 176 (C) of the Clean Air Act (CAA). These regulations cover federally-funded or approved actions that are not covered by the Transportation Conformity Program. The General Conformity requirements (40 CFR Part 93 Subpart A) will apply to SAT at the project level. If future projects include federal actions on Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) highway or transit elements, as well as federal actions on other elements of the project, both requirements may apply (Department of Transportation [DOT] 2011).

The purpose of the General Conformity rule is to ensure that:

- Federal activities do not cause or contribute to new violations of the NAAQS,
- Activities do not worsen existing violations of the NAAQS,
- Delay of attainment of the NAAQS does not occur.

### **HAZARDOUS AIR POLLUTANTS**

The CAA also regulates emissions of hazardous air pollutants (HAPs). HAPs are pollutants that cause or may cause cancer or other serious health effects or adverse environmental and ecological effects.



Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the EPA regulate 188 air toxics (also known as HAPs). An emerging issue is the inventory of airport-related speciated organic gases (OGs) including HAPs. NAAQS have not yet been established for HAPs (except for lead), but Section 112 of the CAA authorizes the EPA to regulate emissions of HAPs. Currently, the EPA is tasked with controlling 187 HAPs.

#### **GREENHOUSE GASES**

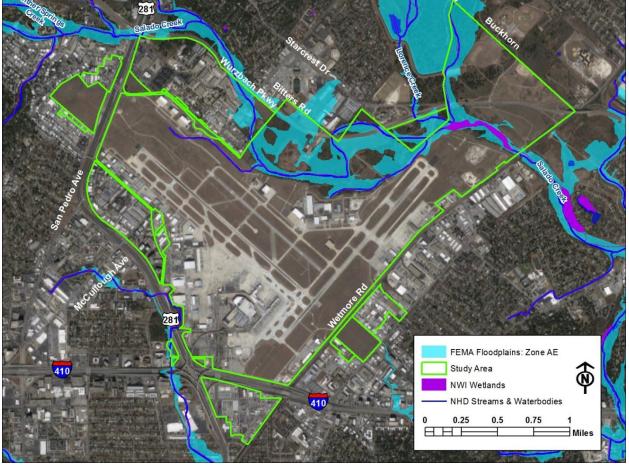
The potential impact of greenhouse gases from aircraft emissions is another environmental issue for the present and long-term future. This topic should be referenced often during the planning study due to changes in the Council on Environmental Quality's (CEQ) guidance of August 1, 2016 being withdrawn on April 5, 2017, as well as current EPA leadership changes.

### 2.11.2 AQUATIC RESOURCES

**Figure 2.11-2** depicts water resources located within the study area including waters, floodplains and wetlands. For future projects, jurisdictional determinations and wetland delineations would be conducted in accordance with U.S. Army Corps of Engineers (USACE) guidelines. If it is determined that a project would result in the placement of temporary or permanent dredge or fill into potentially jurisdictional Waters of the United States (WOUS), including wetlands or other special aquatic sites, a Section 404 permit would be obtained and coordination with the USACE would be required.

If the floodplain cannot be avoided, development must be designed to minimize adverse impacts to the natural and beneficial values of the floodplain. If a significant encroachment to the floodplain is required, the FAA must issue a written finding that the design is the only "practicable alternative" and follow all state and local floodplain regulations.

Figure 2.11-2: Water Resources of the Study Area



Sources: Google Earth Pro, 2018 (aerial imagery); Federal Emergency Management Agency, *National Flood Hazard Layer*; U.S. Fish and Wildlife Service, *National Wetlands Inventory*; U.S Geological Survey, *National Hydrography Dataset*; Poznecki-Camarillo, Inc., July 2018 (annotations).

#### 2.11.3 HAZARDOUS MATERIALS

FAA guidelines recommend avoiding encroachment and acquisition of hazardous waste sites and contaminated properties, to the extent possible. A database search was conducted, and existing environmental reports prepared for SAAS and TxDOT San Antonio District were reviewed to identify sites with contamination concerns within the Study Area and American Society for Testing and Materials (ASTM) search radius. A complete listing of the identified hazardous materials sites within and near the study area is included in Regulatory Database Report (Banks 2018), which is provided separately. The regulatory databases searched as part of this analysis are listed in **Table 2.11-2**.



Table 2.11-2: Hazardous Materials Regulatory Database Summary within 0.5-Mile of the Study Area

REGULATORY RECORD	NUMBER OF SITES IDENTIFIED
Federal Active NPL or Not NPL List	0
Federal Archived or Not NPL List (CERCLIS or SEMS Sites)	1
RCRA CORRACTS	0
RCRA TSD	1
RCRA Generators	24
EPA / TCEQ Brownfield Properties	0
ERNS List	33
TCEQ Superfund Sites	0
TCEQ Municipal Solid Waste Landfill Sites (MSW)	34
TCEQ Leaking Petroleum Storage Tank Lists (LPST)	108
TCEQ Registered Petroleum Storage Tank Lists (PST)	150
Federal / State Institutional Control	1
Federal / State Engineering Control	0
TCEQ Voluntary Cleanup Program Sites (VCP)	3
TCEQ Industrial Hazardous Waste Sites (IHW)	139

Source: Banks 2018.

**Figure 2.11-3** depicts landfills located in the study area. The Airport recently discovered an abandoned municipal waste site on the airfield, under Taxiway R up into the area adjacent to the ARFF station. More sites may exist in addition to those shown on Figure 2.11-3.

#### 2.11.4 POLLUTION PREVENTION

SAT maintains current pollution prevention documents including a Storm Water Pollution Prevention Plan (SW3P) and a Spill Prevention Control and Countermeasures Plan (SPCC). These documents help to properly manage stormwater runoff and to ensure SAT is ready to respond to spills. The most current documents should be referenced and adhered to for any project-specific planning. Any future developments of the Airport property would require updates to the facility's SW3P and SPCC.

## 2.11.5 WILDLIFE HAZARD ASSESSMENT AND WILDLIFE HAZARD MGMT PLAN

A Wildlife Hazard Assessment (WHA) and Wildlife Hazard Management Plan (WHMP) are required under FAA's Wildlife Hazardous Management at Airports to ensure a safe operating environment and to assess the risk and magnitude of wildlife strikes at the Airport. According to the FAA, some of the most hazardous wildlife to airport operations include gulls, waterfowl, raptors and deer. Land uses that attract these species



include putrescible-waste disposal operations, wastewater treatment facilities, wetlands, and dredge spoil containment areas. Per the FAA, the Wildlife Hazard Mitigation Program has several initiatives underway that should be considered during project development including a new FAA AC 150/5200-38-*Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans* (FAA 2018).



Figure 2.11-3: Municipal Solid Waste Facilities near the Study Area

Sources: Google Earth Pro, 2018 (aerial imagery); Alamo Area Council of Governments (AACOG), *Bexar County Inventory of Closed or Abandoned Landfills*; Texas Commission on Environmental Quality, *Municipal Solid Waste (MSW) Facilities*; Banks Regulatory Database Report - 17029-WSP28445A; Poznecki-Camarillo, Inc., July 2018 (annotations).

The Safety and Wildlife Division of SAT received approval from the FAA in 2012 for a WHA and WHMP. In 2012, additional steps were taken to mitigate the jackrabbit population at the airport (SAT 2012).

#### 2.11.6 THREATENED AND ENDANGERED SPECIES

A review of the threatened and endangered species lists for the study area, maintained by the USFWS and TPWD, identified federal- and state-listed threatened, endangered, and candidate species, as well as other species considered rare by the state of Texas.



Per the karst zone maps for the San Antonio area, the study area is located within Karst Zone 3, which is defined as areas (both cavernous and non-cavernous) that probably do not contain endangered karst invertebrate species (**Figure 2.11-4**). Previous studies have been conducted adjacent to and within the study area that identified karst features. TxDOT has informally consulted with federal agencies on projects located adjacent to and within the Study Area, which resulted in a "may affect, not likely to adversely affect" two arachnids (Madla's Cave Meshweaver and Robber Baron Cave Meshweaver).



Figure 2.11-4: Karst Zones of the Study Area

Sources: Google Earth Pro, 2018 (aerial imagery); U.S. Fish and Wildlife Service, *Karst Zones*; Poznecki-Camarillo, Inc., July 2018 (annotations).

## **FEDERALLY-LISTED SPECIES**

The study area was assessed for suitable habitat for federally-listed species. According to this analysis, potential habitat could exist in the study area for the following federally-listed species:

- Bracken Bat Cave Meshweaver (Cicurina venii) federal endangered species
- Cokendolpher Cave Harvestman (Texella cokendolpher) federal endangered species
- Government Canyon Bat Cave Meshweaver (Cicurina vespera) federal endangered species
- Government Canyon Bat Cave Spider (Neoleptoneta microps) federal endangered species



- Madla's Cave Meshweaver (Cicurina madla) federal endangered species
- Robber Baron Cave Meshweaver (Cicurina baronia) federal endangered species
- Beetle (Rhadine exilis) federal endangered species
- Beetle (Rhadine infernalis) federal endangered species
- Helotes Mold Beetle (Batrisodes venyivi) federal endangered species
- Bracted Twistflower (Streptanthus bracteatus) federal candidate species

During future project development, if it is determined that the project has the potential to affect federally-listed threatened, endangered, or candidate species or their critical habitat, coordination with the U.S. Fish and Wildlife Service (USFWS) would be required. Coordination would assess avoidance measures or alternatives to the project, potential permitting requirements, and mitigation for unavoidable impacts.

### STATE-LISTED SPECIES

In addition to evaluating the study area for potential suitable habitat for federally-listed species, evaluation of potential suitable habitat for state-listed species, Species of Greatest Conservation Need (SGCN), and other species considered rare by the State of Texas was conducted. Based on this analysis, potential habitat for the following state-listed threatened, endangered, SGCN, and rare species may be present in the study area:

- Western Burrowing Owl (Athene cunicularia hypugaea) state rare species
- Wood Stork (Mycteria americana) state threatened and SGCN species
- Cave Myotis Bat (Myotis velifer) state SGCN species
- Plains Spotted Skunk (Spilogale putorius interrupta) state rare species
- Big Red Sage (Salvia pentstemonoides) state rare species
- Correll's False Dragon-Head (Physostegia correllii) state rare species
- Hill Country Wild-Mercury (Argythamnia aphoroides) state rare species
- Tree Dodder (Cuscuta exaltata) state SGCN species
- Spot-Tailed Earless Lizard (Holbrookia lacerata) state rare species
- Texas Garter Snake (Thamnophis sirtalis annectens) state SGCN species

Future activities with the potential to impact state-listed species or SGCN would comply with species-specific Best Management Practices (BMPs) in coordination with the Texas Parks and Wildlife Department (TPWD). During the appropriate stage of the project development process, potential impacts to protected species would be evaluated.

### 2.11.7 SOCIOECONOMIC CONDITIONS AND DEMOGRAPHICS

The Study Area is located within the north-central portion of Bexar County. At a county-level, the study area has experienced population growth in the past, and growth is expected to continue at a rate ranging from 0.01 to 0.02 percent per year into 2070.

CT 1913.03

0 0.25



Minority populations are located throughout the Study Area, as depicted on Figure 2.11-5.

Study Area
Census Tracts
CT 1207.01
Block 1040

Figure 2.11-5: Minority Populations of the Study Area

Sources: Google Earth Pro, 2018 (aerial imagery); U.S. Census Data; Poznecki-Camarillo, Inc., July 2018 (annotations).

## 2.11.8 COMMUNITY RESOURCES

Community resources within and near the study area are discussed in the following sections. **Figure 2.11-6** shows the location of these community facilities in relation to the study area, with the exception of places of worship and other community facilities that were identified via Google Earth.

The study area is located within the Alamo Heights and North East Independent School Districts (ISDs). There are no schools located within the study area, but there are fourteen schools within a one-mile radius. There is one place of worship, Oak Hills Church – North Central Campus (551 Nakoma Drive), located within the study area. There are twenty-four other places of worship within a one-mile radius.

Study Area

Fire Station

Police Station

COSA Service Centers

Schools

Bexar County Bicycle Facilities

Bexar County Greenway System
Parks

0 0.25 0.5 1 1.5

Figure 2.11-6: Community Resources in the Vicinity of the Study Area

Sources: Google Earth Pro, 2018 (aerial imagery); City of San Antonio, *Geographic Information System Open Data Portal*; Bexar County Appraisal District; Alamo Area Metropolitan Planning Organization, *Open Data Portal*; Poznecki-Camarillo, Inc., July 2018 (annotations).

Other community facilities within the study area include a government office (Comptroller of the Currency, 10001 Reunion Place #250), a hospital (Leukemia and Lymphoma Society, 1218 Arion Parkway), and a post office (10250 John Saunders Road). An additional 18 other community facilities are located within a one-mile radius of the study area. Community facility types researched for this assessment included community fire stations, police stations, post offices, hospitals, libraries, government buildings, and other community centers.

Desktop reviews identified two parks or recreational areas within the study area and twelve additional parks or recreational areas in the vicinity of the airport, as depicted on Figure 2.11-6. Most of the parks and recreational areas are owned by either the SAAS or Bexar County.

#### 2.11.9 CULTURAL RESOURCES

Cultural resources, including archaeological, historical and architectural sites, and traditional cultural properties located on land owned or controlled by the State of Texas or one of its cities or counties or other



political subdivisions, are protected by the Antiquities Code of Texas (ACT) (Title 9, Chapter 191 of the Texas Natural Resources Code of 1977).

Based on previous survey coverage data available, an estimated 15 to 20 percent of the study area has been previously surveyed, primarily in the northern portions near Salado Creek. However, not all areas near Salado Creek within the study area have been surveyed. These surveys identified three previously recorded archaeological sites within the study area, as well as six additional sites within 1 kilometer (km) (0.62 mile) of the study area. The three previously recorded sites within the study area were determined to be not eligible to the National Register of Historic Places (NRHP). Review of soil maps and the TxDOT's Potential Archaeological Liability Map (PALM) suggests that portions of the study area, if undisturbed, contain a high potential for buried prehistoric archeological resources, especially in the vicinity of Salado Creek (Figure 2.11-7).

In accordance with the NHPA and ACT, potential project impacts on archaeological sites would be considered during project development.

# 2.11.10 SECTION 4(F) PROPERTIES

Section 4(f) of the 1966 DOT Act is codified in Title 23 U.S. Code (USC) Paragraph 138 (referred to as 23 USC 138) and 49 USC 303. The act requires special consideration to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.

A Section 4(f) property is any significant publicly-owned park, recreation area, wildlife and waterfowl refuge, or public or private historic property (including archaeological sites) protected by 23 CFR 774. There are two known Section 4(f) properties within the study area, including the following publicly-owned parks and recreation areas: McAllister Park and Salado Creek Greenway North. There are no TPWD Wildlife Management Areas (WMAs) or USFWS wildlife refuges within the study area that would be subject to Section 4(f). Although there are three previously recorded archaeological sites in the study area, these were determined to be not eligible to the NRHP, and are therefore not considered Section 4(f) properties.

There are additional Section 4(f) resources within SAT's noise contours, including nearby public parks. Special consideration should be given to the evaluation of the significance of noise impacts within Section 4(f) properties.

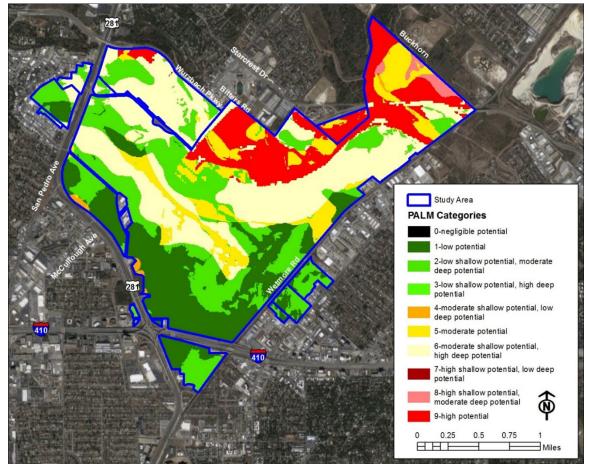


Figure 2.11-7: Potential Archaeological Liability Map of the Study Area

Sources: Google Earth Pro, 2018 (aerial imagery); Texas Department of Transportation, *Potential Archeological Liability Maps*; Poznecki-Camarillo, Inc., July 2018 (annotations).

### 2.11.11 CHAPTER 26 PROPERTIES

The Parks and Wildlife Code (PWC), Title 3, Chapter 26, similar to Section 4(f) of the DOT Act, requires the FAA to make specific findings before approving the use of certain kinds of public lands for an aviation project.

Future projects that may impact the park areas would require Chapter 26 compliance. There are two requirements for complying with Chapter 26: (1) public involvement, and (2) determinations. Public involvement requirements include providing public notice and holding a public hearing.

## 2.11.12 NOISE SENSITIVE LAND USES/RECEPTORS

In accordance with 14 CFR Part 150, *Airport Noise Compatibility Planning*, SAT developed a Noise Compatibility Program (NCP) that describes current and future non-compatible land uses in the study area, which was first submitted to the FAA in 1990. Amendments and approvals since then are described in the most recent Record of Approval from the FAA for the 14 CFR Part 150 *SAT NCP Update*, with an FAA approval date of June 2015.



Noise sensitive land uses/receptors identified in the study area include parks, schools, potential historic districts or places, and current residential zoning areas, as shown on **Figure 2.11-8**. The noise contours shown on Figure 2.11-8 represent the computer-modeled Day-Night Average Sound Level (DNL) contour estimates depicted in terms of equal-exposure 65 and 70 DNL noise contours. Noise contours shown represent those from the *Noise Exposure Map Update Noise Compatibility Program Revision* (SAT, December 2014, PDF page 7).

Study Area
SAIA Noise Contours (2019)
Current Schools
Cemeteries
State Historic Sites
National Register Historic District
National Register Historic District
National Register Historic Place
COSA Historic Landmark Sites
Park Boundaries
Current Zoning Noise Sensitive
Uses
Future Planned Noise-Sensitive
Uses
Master Development Plans
Future Planned Noise-Sensitive
Uses
Master Development Plans
Future Planned Noise-Sensitive
Uses
State Noise Control State
State Noise Control
State Nois

Figure 2.11-8: Future 2019 Noise Sensitive Land Uses/Receptors

Sources: Google Earth Pro, 2018 (aerial imagery); City of San Antonio, *Geographic Information System Open Data Portal*; Bexar County Appraisal District; Alamo Area Metropolitan Planning Organization, *Open Data Portal*; Texas Education Agency, *Geographic Information System Data*; Texas Historical Commission, *Geographic Information System Data*; San Antonio International Airport Noise Exposure Map Update (2014); Poznecki-Camarillo, Inc., July 2018 (annotations).

# 2.12 UTILITY AND DRAINAGE INVENTORY

Several areas of the Airport are under construction or construction was recently completed, including connection to or extension of existing Airport utility services. In the terminal area, the new CONRAC, long-term parking garage, access road system, and Terminal B have been completed. Much of the utility infrastructure planning in this area has included making allowances for the future construction of Terminal



C. Documentation for some of the utility construction in this area was obtained and existing utility documentation is being constantly updated. Airport utilities consist of water, sewer, telephone, natural gas, electricity, and the chilled water/steam system.

#### 2.12.1 WATER AND SANITARY SEWER

### **WATER**

The San Antonio Water System (SAWS) supplies potable and fire water to Airport facilities. The Airport lines are within the SAWS pressure zone PZ-5 service area. The SAWS Water Statistics (12/31/2013), which are available on the SAWS website, indicate that PZ-5 has several pump stations (a total of 9 primary wells and 2 active secondary wells), with a total well pump capacity of 108.9 million gallons per day (mgd). The pump stations have a total high service (distribution) pumping capacity exceeding 154.1 mgd, ground storage tank facilities with a total capacity of 17.9 million gallons and elevated storage tank capacity of 8.0 million gallons.

As shown on **Figure 2.12-1**, the Maltsberger Pump Station, located across U.S. 281 from the Airport near Northern Boulevard and Jones Maltsberger Road, provides the primary service for the airport neighborhood. It has six wells, 7.5 million gallons of ground storage capacity, and six high service pumps for a total pump capacity of 66.7 mgd.

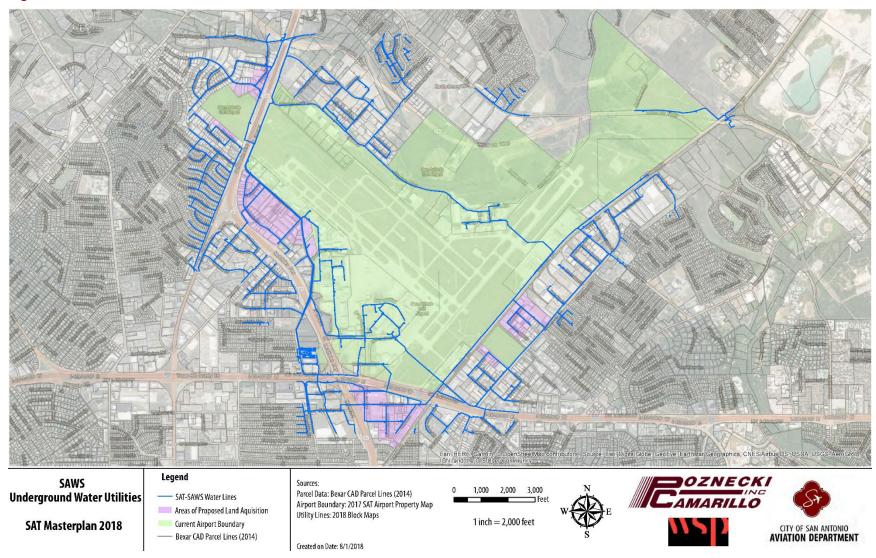
The water system includes parallel 30-inch and 36-inch transmission lines that extend north of Maltsberger Pump Station in the Jones Maltsberger Road and Sandau Road rights-of-way to U.S. 281 west of the Airport. The transmission lines continue north in the east U.S. 281 right-of way to a point north of Braniff Street, then the 36-inch line crosses to the west right-of-way, and the 30-inch line narrows to 24-inch line. Both lines continue northward beyond the limits of the Airport property.

On the north side of the Airport, a 16-inch SAWS line extends from U.S. 281 east to East Nakoma Drive. The 16-inch line narrows to a 12-inch line at East Coker Loop and continues east along Nakoma Street and Skyplace Boulevard, ending near C Street. A 12-inch line located beneath 1st Avenue parallels the last 800 feet of the Skyplace Boulevard line and extends further east beneath Runway 4-22 to the eight-inch main beneath Wetmore Road. The two 12-inch lines are separated by approximately 400 feet and are not connected

On the east side of the Airport, an 8-inch line extends north in the Wetmore Road right-of-way, from a 16-inch line at Loop 410 to a 12-inch line located at the southeast corner of the Airport property. A 12-inch line parallels this 8-inch line in the Broadway Street right-of-way, with several 8-inch lines cross connecting with this line. Along the south side of the Airport, a 20-inch SAWS transmission line is located along the side of the Loop 410 Loop right-of-way.



Figure 2.12-1: Water Utilities





Primary service to the 12-inch loop in the terminal area is provided by a 16-inch main that extends from the 30-inch transmission line beneath Jones Maltsberger Road through Loop 410 and Dee Howard Way, south in the east right-of-way of U.S. 281, then east along South Terminal Drive, to its intersection with Airport Boulevard. The 12-inch loop is also connected by an 8-inch line extending south to the 20-inch transmission line beneath Loop 410, and an 8-inch line extending southeast to the 8-inch line beneath Wetmore Road. Service to the cargo and hangar areas west of the terminals is provided by the 12-inch line beneath John Saunders Road, or to various 8-inch lines connecting into the water system along the Airport boundary.

#### **SEWER**

Wastewater effluent collection and treatment is provided by SAWS. The Airport is located within the service area of the Dos Rios Wastewater Treatment Plant. The SAWS Water Statistics (12/31/2013) indicate that the plant has permit flow capacity of 125 mgd, and an actual average daily influent flow of 78.4 mgd (2013).

As shown on **Figure 2.12-2**, the west side of the Airport property is served by a 15-inch to 18-inch sanitary trunk that extends south of U.S. 281 in the Sandau Road and Jones Maltsberger Road rights-of-way, and then east of the U.S. 281 right-of-way to South Terminal Drive. At this point, the 18-inch sewer trunk crosses to the west side of the U.S. 281 and continues south. On the north side, a 27-inch SAWS sewer is generally adjacent to Salado Creek, portion of which align within the Airport boundary.

The northeast area of the Airport is served by internal laterals that connect to this sewer. The southeast corner of the Airport is served by a 10-inch sewer located beneath Wetmore Road, from south of Loop 410 to approximately 500 feet north of the Loop 410 right-of-way. No other sanitary sewer service is located beneath Wetmore Road on the east boundary of the Airport.

The terminal area is served by two primary sewer laterals. The first trunk is a 12-inch sewer extending from the vicinity of Terminal B, west along North Terminal Road and south along West Terminal Road to a 16-inch sewer beneath South Terminal Road. The 165-inch then extends west to the 18-inch sewer trunk beneath U.S. 281. The second 10-inch and eight-inch sewer extends south and southeast from the area of Terminal A. These connect to the 10-inch sewer beneath Wetmore Road at the southeast corner of the Airport via a 12-inch line that runs perpendicular to Runway 4-22.

### 2.12.2 ELECTRICITY

### **OVERHEAD**

As shown on **Figure 2.12-3**, in the western portion of the Airport property, medium voltage wooden poles line Northern Boulevard to International Street, to feed underground lines beneath Airport Boulevard toward Terminals A and B. The line of wooden poles cross private property, nearly reaching U.S. 281. The lines feeding the cargo and hangars area come through Isom Road, from U.S. 281 to Sandau Road and Jones Maltsberger Road.



Figure 2.12-2: Underground Sewer Utilities

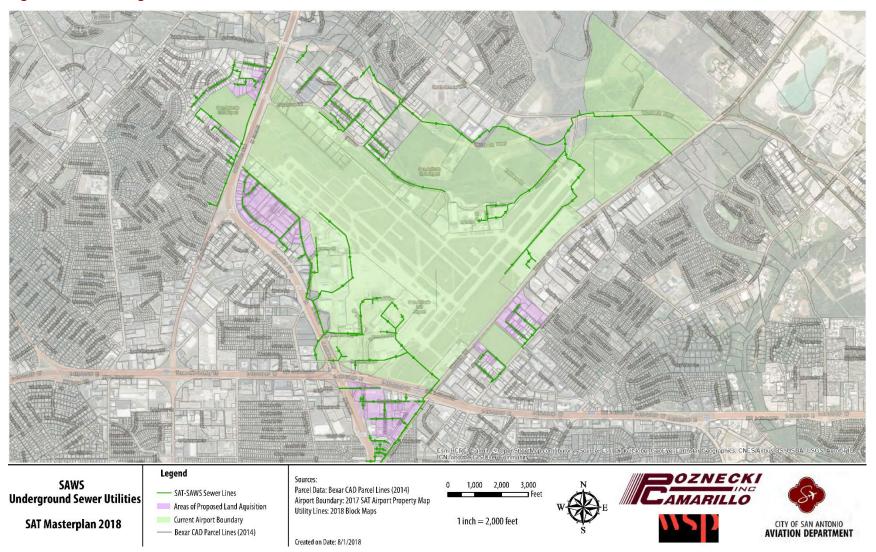
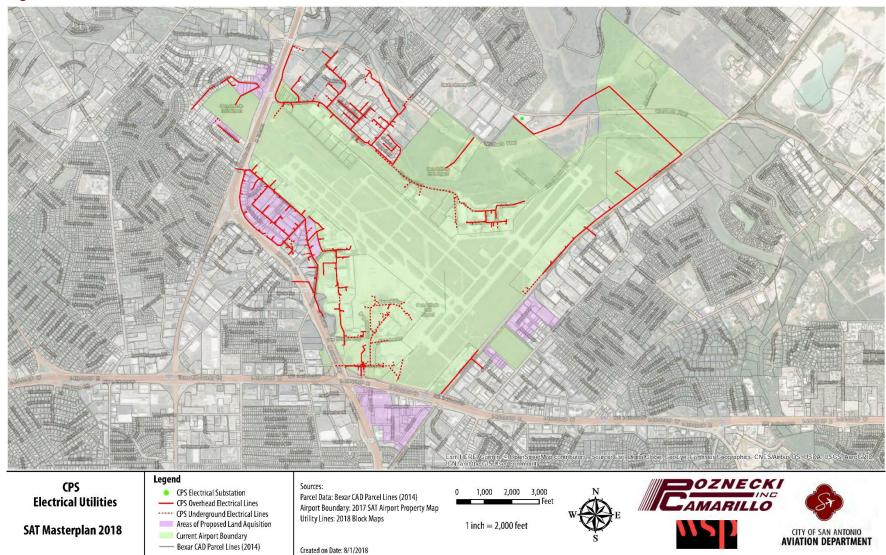




Figure 2.12-3: Electrical Utilities





In the southeast portion of the Airport property, medium voltage wooden poles begin at Wetmore Road and Loop 410 and stretch 2,000 feet north. At about 3,500 feet ahead on Wetmore Road, the wooden poles cross Wetmore Road to East Bitters Street. In Mud Creek, a transmission line crosses over the creek and a line of iron poles begins on the other side, in both directions, towards Wetmore Road to Wurzbach Parkway.

From the northern portion of the Airport property, beginning at Wurzbach Parkway and finishing 1,000 feet before NE Entrance Road, powerlines continue as a low voltage wooden pole line. At First Avenue, powerlines stretch about 1,500 feet to C and D Streets. In the northwest portion of the Airport property, through East Nakoma Drive from U.S. 281, powerlines continue as a medium voltage wooden pole line, feeding the north portion of the Airport property. This line continues along East Nakoma Drive through Skyplace Boulevard at the northern-most boundary of the Airport.

#### UNDERGROUND

Also shown on Figure 2.12-3, for feeds to Terminals A and B, the underground line begins at Northern Boulevard and International Street to Airport Boulevard, and goes through East Terminal Drive, North Terminal Drive and West Terminal Drive. There are various underground lines around the ATCT block area. The cargo and hangar areas have two underground lines, one originating in the West Cargo area, and the other at Paul Wilkins Street.

#### **2.12.3** COMMUNICATIONS

There are two types of communication utilities: overhead and underground. Two utility providers provide cable, fiber, and phone service to the Airport: Charter Communications (Spectrum), depicted on **Figure 2.12-4**, and Grande Communications Networks, LLC, depicted on **Figure 2.12-5**. It is important to note that the Zayo Group has a fiber line in the Airport vicinity, but outside the Airport, and not currently providing service to the Airport. Windstream Enterprise has one line in the Loop 410 right-of-way, beginning at Wetmore Road and finishing at U.S. 281, also outside the Airport.

Charter Communications and Grande Communications provide services to the western portion of the Airport, and Grande Communications to the eastern portion of the Airport.

#### **OVERHEAD**

In the western portion of the Airport property, Charter Communications provides communication services, beginning at U.S. 281 and Jones Maltsberger Road, and continuing to Sandau Road. The cargo and hangar areas get this service through wooden poles along Paul Wilkins Street, West Cargo Street and Jon Cape Streets.

The northwest portion of the Airport has a wooden pole line from Wurzbach Parkway and U.S. 281 toward the northernmost boundary of the Airport at East Nakoma Drive to Skyplace Boulevard. Before this, at East Nakoma Drive, there are some branches through East Coker Loop, Gordon Road and Jones Maltsberger Road.

Grande Communications provide services in the same area, beginning at Wurzbach Parkway through Jones Maltsbeger Road, East Nakoma Drive, Arion Parkway, and Clydeville Road.



Figure 2.12-4: Communications Utilities (Charter Communications)

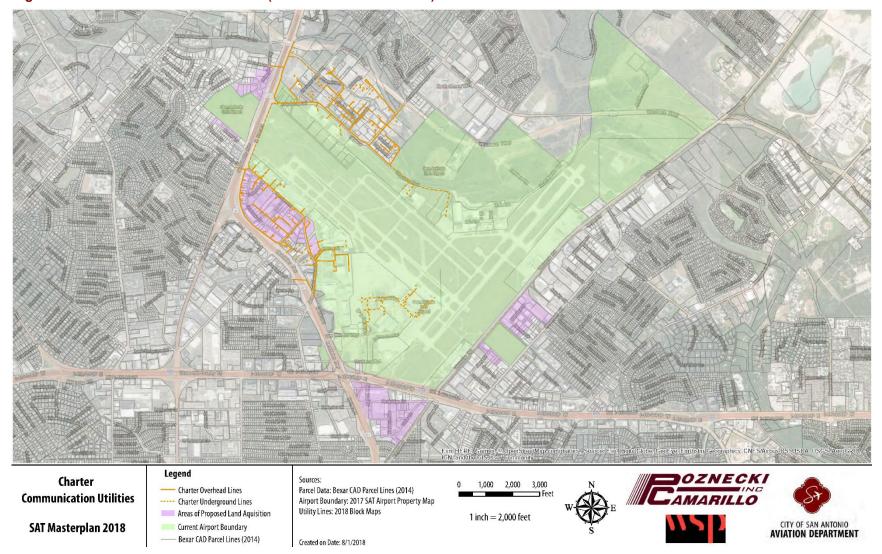
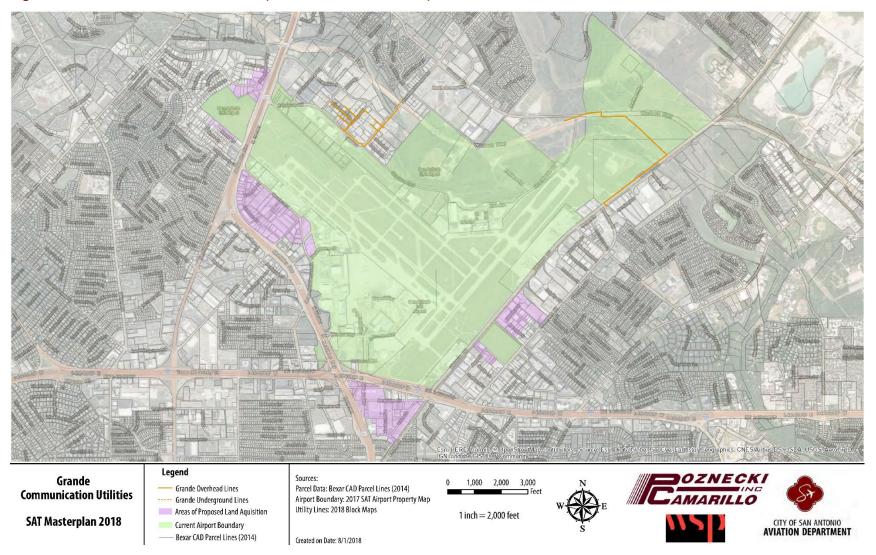




Figure 2.12-5: Communications Utilities (Grande Communications)





In the eastern portion of the Airport, Grande Communications provides services using wooden poles from Wurzbach Parkway through Wetmore Road to Broadway Street.

In the southern portion of the Airport, along Wetmore Road, there is a wooden pole line beginning at Loop 410 and continuing for 2,000 feet north along Wetmore Road.

### **UNDERGROUND**

Charter Communications provide services to Terminals A and B with an underground fiber line beneath East Terminal Drive, North Terminal Drive, Terminal Boulevard and Airport Boulevard. Nearly a closed loop, it connects to an underground fiber at Reunion Place.

In the northern portion of the Airport, around East Nakoma Drive, there are various fiber dips from overhead wiring to underground lines into nearby businesses. Another line begins at U.S. 281 towards Arion Parkway and runs along Skyplace Boulevard. This line dips and provides service to the manufacturing area in the northernmost area of the Airport property, continuing service at C Street and ending at First Avenue.

### 2.12.4 GAS

Natural gas service is provided to the Airport by CPS Energy, which provides all-natural gas and electrical service in the area. As shown on **Figure 2.12-6**, the gas lines servicing SAT range in size from 4-inch to 12-inch for distribution, including small-diameter service lines to various facilities. Natural gas supply mains are located near the thoroughfares of Starcrest Drive and Wurzbach Parkway and Wetmore Road, ranging in size from 16-inch to 24-inch for transmission. The SAAS has several active natural gas accounts with CPS Energy. These accounts are for the terminals, the West Cargo Building, the Airport Maintenance Yard, and the ARFF Station. Based on this information, it was determined that the leaseholders on the airfield that do not lease space in the terminal have separate gas meters and accounts with CPS Energy.

#### 2.12.5 FEDERAL AVIATION ADMINISTRATION DUCTBANK

The FAA owns and maintains communications facilities at SAT. In addition to providing communications, the FAA facilities supply power to the PAPI and REIL. Plans of the Airport Cable Rerouting Project dated 2-12-2010, which rerouted the FAA duct banks and cables throughout the Airport property, were obtained from the SAAS, and are shown on **Figure 2.12-7**. The FAA facilities are typically composed of concrete encased duct banks, cables, fiber, handholes, pull boxes, manholes, and control boxes.



Figure 2.12-6: Natural Gas Utilities

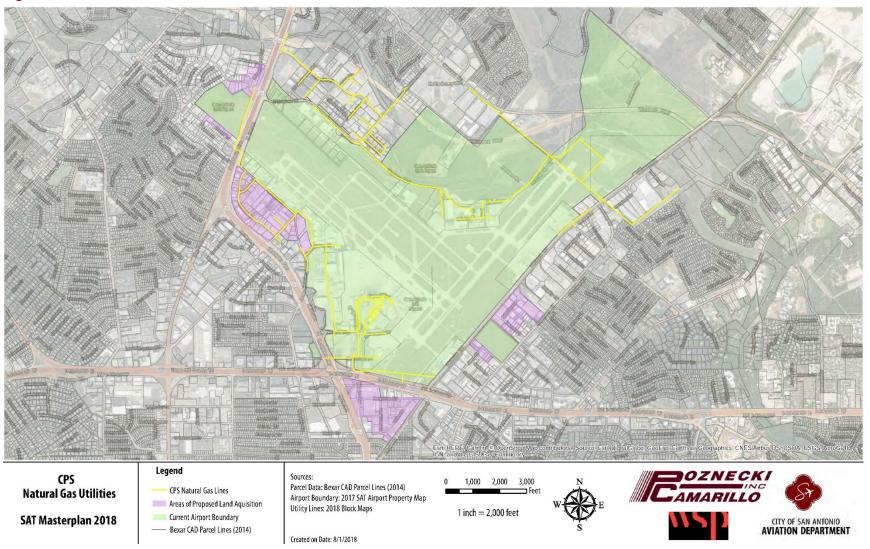
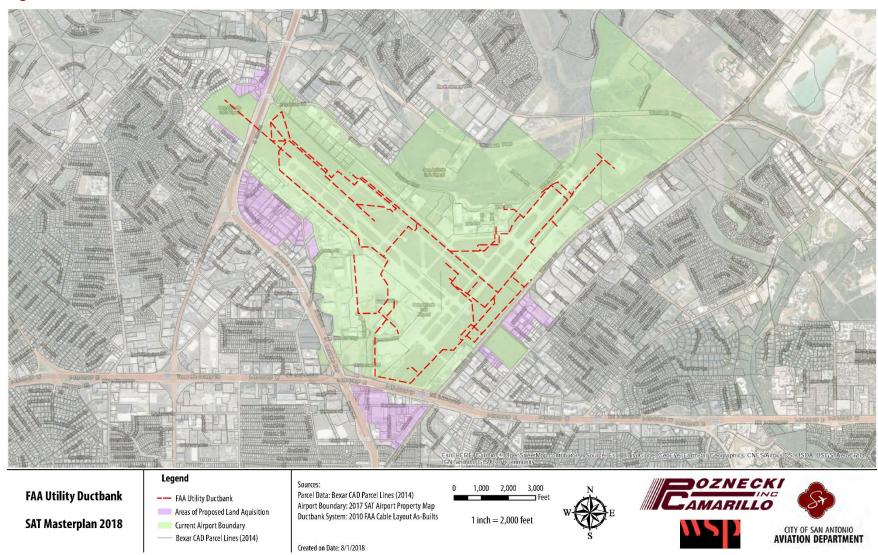




Figure 2.12-7: Federal Aviation Administration Duct Banks





#### 2.12.6 DRAINAGE INVENTORY

The drainage inventory described in this section will provide the information necessary for the assessment of existing drainage capacity and development of proposed drainage improvements, as part of the SDP. SAT is located north of downtown San Antonio, at the intersection of US-281 and I-410. Refer to **Figure 2.12-8** for the Location Map, and **Figure 2.12-9** for the USGS map. The airport storm water runoff drains to three separate and distinct locations:

- Salado Creek, located on the Northside of the Airport
- Airport Tributary, located to the southwest of the airport, on the east side of Wetmore Boulevard
- The City of San Antonio storm sewer systems, located on the eastside of the Airport

Within the Airport, the runways, taxiways, terminals, and other facilities are primarily drained through underground drainage systems that have been constructed over several years, as various improvements were made to the Airport. The majority of the airside drainage systems flow to the north and outfalls into Salado Creek through approximately 18 outfalls.

The analysis of the drainage systems for SAT is based on the following design criteria:

- FAA AC 150/5320-5D, Airport Drainage Design (August 15, 2013)
- City of San Antonio Transportation & Capital Improvements (TCI), *Storm Water Design Criteria Manual* (January 2016)
- San Antonio River Basin Regional Modeling Standards for Hydrology and Hydraulic Modeling (September 2013)
- Texas Department of Transportation, *Hydraulic Design Manual* (July 2016)

The Salado Creek drainage area is bounded by Wurzbach Parkway to the north and the Airport on the south. At the Airport, the Salado Creek receives stormwater flow from approximately 126 square miles of contributing area. The northwest drainage area of the Salado Creek splits into two forks, which then join before the intersection with Wetmore Road.

It was noted during the drainage inventory kick-off meeting (April 2018) that there was limited information regarding the underground drainage system, and portions of the information available could be unreliable.

Previous drainage studies performed on the Airport include the International Airport Drainage Survey and Master Plan Phase II (1984), International Airport Relocation of Salado Creek for the City of San Antonio Department of Aviation (1985), San Antonio International Airport Drainage Master Plan Update (1990), San Antonio International Airport Master Plan (1998), and San Antonio International Airport Terminal Programming Study (2003). The data obtained from these studies was not detailed enough, and therefore, insufficient for the drainage inventory.



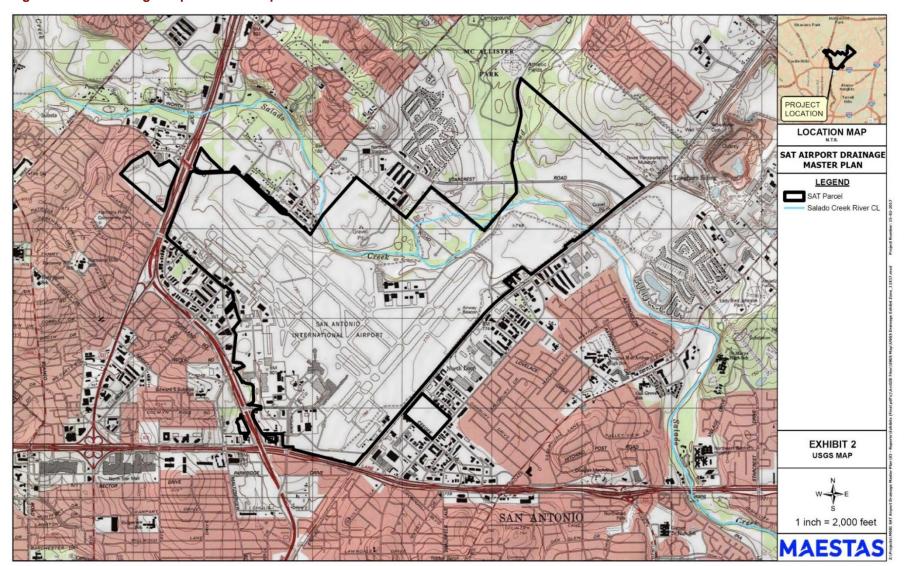
Figure 2.12-8: Drainage Airport Location Map



Sources: Maestas, 2018.



Figure 2.12-9: Drainage Airport USGS Map



Sources: Maestas, 2018.



The following is a summary of the data collected for the drainage inventory:

- Federal Emergency Management Agency and San Antonio River Authority
  - The effective Hydrology and Hydraulic model for the Salado Creek was obtained from the San Antonio River Authority (SARA), who is a partner of the Federal Emergency Management Agency (FEMA), as part of the Letter of Map Revision Delegation Program. The Salado Creek, within the project limits, is within the Flood Insurance Rate Map (FIRM) for Bexar County, and Incorporated Areas, Map Panel 48029C0265G, effective September 29, 2010. The Salado Creek is designated as a detailed study Zone AE. Currently, there are two Letter of Map Changes (Case No. 14-06-3615P and Case No. 16-06-1504P) within the Salado Creek project limits. Refer to Figure 2.12-10 for the FEMA FIRM map.
  - 2017 LiDAR, developed by Fugro Geospatial, Inc. (Published on September 22, 2017). The horizontal Datum is the North American Datum of 1983 (NAD83, 2011) in meters. The vertical datum is the North American Datum of 1988 (NAVD88) in meters. The LiDAR data horizontal accuracy is approximately 0.27 meters, and the vertical accuracy is approximately 0.17 meters.
  - 2017 Aerial Imagery
  - FEMA National Flood Hazard Layer data inventory (floodplains, base flood elevations, cross sections, etc.)

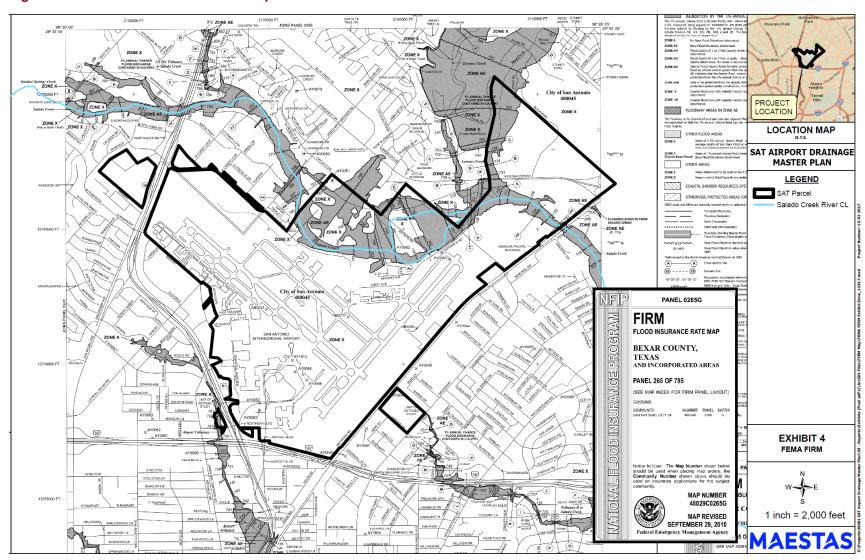
## TxDOT

- Plans of Proposed Access Road to Military Reservation (1941), from a point 0.4 miles south of Zercher Road to a junction with Camp Bullis Road
- Plans of Proposed State Highway Improvements (1977), from Sandau Road to 0.7 miles north of Bitters Road
- Plans of Proposed State Highway Improvement (2010), Wurzbach Parkway from Jones-Maltsberger to Wetmore Road
- Plans of Proposed State Highway Improvement (2011), Wurzbach Parkway from West Avenue to Jones Maltsberger Road
- City of San Antonio, Transportation & Capital Improvements (TCI)
  - Impervious cover GIS shapefiles (November 22, 2013)
  - City of San Antonio storm water GIS shapefiles including channels, inlets, manholes, outfalls, and underground infrastructure

|\\S|



Figure 2.12-10: Flood Insurance Rate Map 48029C0265G



Source: Federal Emergency Management Agency, Flood Insurance Rate Map, September 2010.



- · City of San Antonio, Aviation Department
  - List of Reports and Exhibits:
    - Existing Airport Layout Plan (AECOM, 2017)
    - Airport Property Map (AECOM, 2017)
    - Future Airport Layout Plan (AECOM, 2017)
    - San Antonio Master Plan Final Technical Report (Ricondo & Associates, Inc., 1998)
    - Report of San Antonio International Airport Pavement Management and Maintenance Plan (Kimley-Horn and Associates, Inc., 2013)
    - Flood Profiles of Lorence Creek, Salado Creek, and Mudd Creek (FEMA, 2017)
    - City of San Antonio Hydrology Impact Study (Kimley-Horn and Associates, Inc., 2013)
    - Pavement and Drainage Design Report-Extension of Taxiway Romeo at San Antonio International Airport (CDS/Muery Services, 2006)
    - Salado Creek Floodplain Analysis-Wurzbach Parkway Arterial Connector (Hewitt Engineering Inc., 2012)
  - List of As-built documents:
    - Plans of Terminal Area Taxiway Improvements (Package 2) (Kimley-Horn and Associates, Inc., 2015)
    - Plans of Runway 12R-30L Rehabilitation and Terminal Area Taxiway Improvements (Package 1) (Kimley-Horn and Associates, Inc., 2013)
    - Plans of Terminal Area Taxiway Improvements (Package 3) (Kimley-Horn and Associates, Inc., 2015)
    - Plans of Remove Bridge, Remove MSW and Reconstruct Taxiway R (Parallel) (Package 5) Including Environmental Mitigation (Kimley-Horn and Associates, Inc., 2017)
    - Plans of Runway 3/21 Extension-Mass Grading Phase 1B at San Antonio International Airport (AECOM, 2010)
    - Plans of Street and Drainage Improvements at San Antonio International Airport (Garcia & Wright Consulting Engineering, 2003)
    - Plans of Taxiway RC Extension-Phase 2 at San Antonio International Airport (DMJM Aviation & AECOM, 2010)
    - Plans of Taxiway RC Extension-Phase 3 at San Antonio International Airport (AECOM, 2014)
    - Plans of Runway 3/21 Extension-Mass Grading at San Antonio International Airport (AECOM, 2012)
    - Plans of Sky Place Drainage Improvements Phase 1 at San Antonio International Airport (Vickrey & Associates, Inc., 2008)

### 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



- Plans of San Antonio International Airport Air Cargo Apron Expansion Phase II (Pape-Dawson Engineers, 2003)
- Plans of Reconstruction of Taxiway D (K.M.NG & Associates, Inc., 2003)
- Plans of New Right-of-Way at San Antonio International Airport (M-E-I Consultants, Inc., 2005)
- Plans of Runway 12R and Taxiway G (Brown Engineering Co., 1986)
- Plans of East Air Cargo Expansion-Phase II Landside Improvements at San Antonio International Airport (Pape-Dawson Engineers, 2007)
- Plans of International Airport Strengthening & Extension Runway 12L-30R; Construct Taxiway "H", Construct Portion of Taxiway "N"; Construct Taxiways "J" and "K"; Construct By-Pass Taxiway; Construct Access Taxiway; Electrical Additions and Modifications (Henry Bain Engineers, Inc., 1982)
- Plans of Runway 12R Safety Area Improvements San Antonio International Airport (Civil Engineering Consultants, 1993)
- Plans of Reconstruction of Runway 3-21 (Garcia & Wright Consulting Engineers, Inc., 1991)
- Plans of New Remain Over Night Apron at San Antonio International Airport (CDS/Muery Services, 2005)
- Plans of Runway 3/21 Extension; Paving and Electrical for Runway 21 and Taxiway Q at San Antonio International Airport (AECOM, 2012)
- Plans of East Air Cargo Expansion-Phase II Ramp and Parking Improvements at San Antonio International Airport (Pape-Dawson Engineers, 2003)
- Plans of San Antonio International Airport Runway 3-21 Extension 24 Gas Supply Main Relocation (Vickrey & Associates, 2011)
- Plans of Taxiway "H" Reconstruction at San Antonio International Airport (Poznecki, Camarillo and Associates, Inc., 2001)
- Plans of Taxiway Foxtrot "F" Reconstruction (Vickrey & Associates, Inc., 1999)
- Plans of Taxiway "H" Reconstruction Phase I-Drainage at San Antonio International Airport (Poznecki, Camarillo and Associates, Inc., 1996)
- Plans of San Antonio International Airport Apron Construction (Day & Zimmermann, Inc., 1992)
- Plans of Cargo Apron Improvements (W.E. Simpson Company Inc., 1995)
- Plans of Taxiway R Construction (K.M. NG & Associates, Inc., 1988)
- Plans of San Antonio International Airport Construct Taxiway Quebec; Drainage Improvements; Sanitary Sewer Improvements; Lighting Improvements; Water Improvements (Vickrey & Associates, Inc., 1994)

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



- Plans for International Airport Strengthening & Extension Taxiway "N"; Construct Connector Taxiway to Runway 3-21; Taxiway "D" Drainage Improvements; Taxiway "D" Pavement Reconstruction; Taxiway "K" Guidance Signs (Henry Bain Engineers, Inc., 1984)
- Field Work and Data Collection

Field surveys were performed by Civil Engineering Consultants, Inc.:

- The field survey was limited and targeted to include major storm sewer trunk lines, outfalls and major inflow locations. Laterals were obtained at targeted areas, or areas where access was possible without impacts to active airport operations.
- Field survey was performed from May to July 2018. The data obtained includes elevations and locations of outfalls, inlets, conduits, channel cross sections, bridges, and natural ground elevations.
- Pipe sizes verified and observed by field survey varied from 6-inch in diameter to 72-inch in diameter. The pipe material verified and provided were RCP, PVC and CMP.
- Refer to Figure 2.12-11 for the survey exhibit.

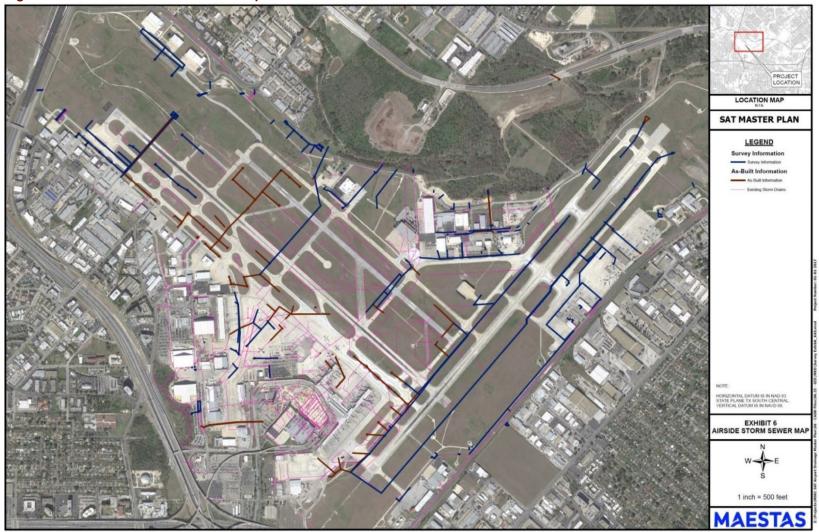
The data collected for the drainage inventory task was verified and processed using GIS and AutoCAD to develop a corrected effective and proposed hydraulic model for the Salado Creek. Additionally, the data available was utilized to revise the drainage system maps, develop new drainage areas and calculate revised runoff flow. Areas where no data was obtained due to lack of availability of as-built information or inaccessibility by the field survey crews was either assumed using professional judgement or excluded from the analysis.

The only significant rain event documented during the start of this project occurred on July 9, 2018. Approximately 2.5 inches of rainfall in 24 hours were recorded for the day of July 9, 2018. Although this amount of rainfall recorded is less than a one-year rainfall frequency, the Salado Creek accumulated enough runoff to overtop the road crossing at East Bitters Road and cause a road closure at NE Entrance Road. The basin located near the western portion of Skyplace Boulevard received a significant amount of runoff, but seemed to function properly. See **Figure 2.12-12** to **Figure 2.12-16** for photographs from the July 9, 2018 rain event.

From the information gathered for the drainage inventory, the Salado Creek generates a large amount of flow due to its large corresponding drainage area. Most of the Airport drains to the Salado Creek through multiple outfalls, which as seen in the rain event documented on July 9, 2018, can generate significant runoff in rain events lower than the statistical one-year frequency storm.



Figure 2.12-11: Airside Storm Sewer Map



Sources: Maestas, 2018.



Figure 2.12-12: Salado Creek at Jones Maltsberger Road - July 9, 2018 Rain Event



Source: Maestas, 2018.

Figure 2.12-13: Salado Creek at E. Bitters Road - July 9, 2018 Rain Event



Source: Maestas, 2018.



Figure 2.12-14: Salado Creek at Wetmore Road - July 9, 2018 Rain Event



Source: Maestas, 2018.

Figure 2.12-15: Runoff entering drainage basin near Skyplace Boulevard - July 9, 2018 Rain Event



Source: Maestas, 2018.



Figure 2.12-16: Drainage basin outlet near Skyplace Boulevard - July 9, 2018 Rain Event



Source: Maestas, 2018.

#### 2.13 VICINITY LAND USE AND CONTROLS

This section discusses on-airport land uses, off-airport land use inside the Airport's runway protection zones (RPZ), and current zoning of the Airport property.

#### 2.13.1 ON-AIRPORT LAND USES

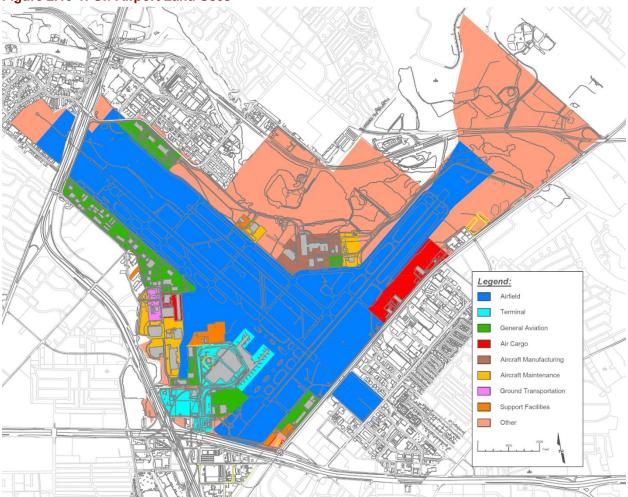
Existing on-airport land uses are depicted on Figure 2.13-1, and defined below:

- Airfield: runways, taxiways, aprons, and taxilanes, as well as safety areas applicable to aircraft operations (e.g. Taxiway Object Free Areas, Runway Safety Areas [RSA], etc.).
- Passenger Terminal: passenger terminal and concourse buildings, and other landside facilities, including curbside and vehicle parking. This item does not include rental car facilities.
- Airline and Airport Support: facilities supporting, but not part of, passenger terminal operations. They include fuel storage facilities, ground support equipment, employee parking, etc.
- Rental Car: facilities used for rental cars (pick up and return), support and storage facilities.
- Air Cargo: areas used and dedicated to the movement, distribution, and delivery of cargo (e.g. hangars, offices).



- General Aviation: general and business aviation facilities and FBO, and areas where services are
  provided to the general aviation community, including hangars, aircraft parking aprons, offices, fuel
  farms, etc.
- Aircraft MRO: facilities used and dedicated to aircraft maintenance, repair and overhaul.
- Aircraft Manufacturing: areas used for the manufacturing and heavy modification of aircraft (M7
  Aerospace complex).
- Aviation Education and Training: flight schools and other aeronautical educational facilities.





Sources: San Antonio International Airport, Airport Layout Plan, 2017 (basemap); WSP USA, 2018.

Table 2.13-1 provides an inventory of on-Airport land uses, by acres and percentage of the Airport property.



Table 2.13-1: Existing Airport Land Use

EXISTING LAND USE	AREA (ACRES)	PERCENT OF TOTAL (%)
Airfield	1,035	43.5
Passenger Terminal	110	4.6
Airline and Airport Support	25	1.1
Air Cargo	65	2.7
General Aviation	156	6.6
Aircraft Maintenance, Repair and Overhaul	69	2.9
Aircraft Manufacturing	46	1.9
Aviation Education & Training	12	0.5
Other	862	36.2
Total	2,380	100%

Source: WSP USA, 2018.

#### 2.13.2 RUNWAY PROTECTION ZONES

The FAA defines the RPZ as a trapezoidal area "off the end of the runway end that serves to enhance the protection of people and property on the ground" in the event an aircraft lands or crashes beyond the runway end. RPZs underlie a portion of the approach closest to the airport. Design criteria for RPZs are specified in FAA AC 150/5300A, *Airport Design*. Specific FAA land use policies are described in the APP-1/AAS-1 memorandum from September 27, 2012, *Interim Guidance on Land Uses Within a Runway Protection Zone*.

Overall, the RPZ footprint shall be controlled by the airport sponsor and be maintained clear of construction and other activities.

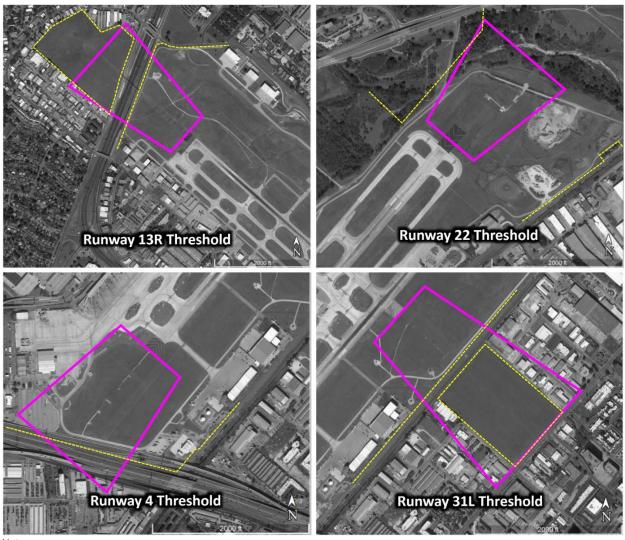
At SAT, most of the RPZs are on Airport property and meet FAA policies except the following, as shown on **Figure 2.13-2**:

- Runway 4 Threshold: the RPZ encompasses a car parking lot (Red Lot), a portion of Interstate 40 (I-40), and a parcel with a commercial building. I-40 and the land beyond the highway are not controlled by the SAAS.
- Runway 22 Threshold: a small portion of the RPZ is off-airport property (less than one acre).
- Runway 13R Threshold: US-281 and San Pedro Avenue cross the RPZ, and this roadway corridor
  is off-Airport. Parcels on the lateral edge of the RPZ are uncontrolled and are occupied by
  commercial activities (e.g. car shops).
- Runway 31L Threshold: Wetmore Road and railway tracks are crossing the RPZ and are not part
  of the Airport property. Freight trains are often parked along Wetmore Road for prolonged periods



of time. Between Wetmore Road and Broadway Street, only part of the RPZ (central portion) is controlled by SAAS. The lateral edges of the RPZ are off-Airport and occupied by commercial and industrial buildings.

Figure 2.13-2: Runway Protection Zones



Notes:

Purple line: RPZ

Dashed yellow line: property line near the RPZ.

Sources: Google Earth Pro, 2018 (aerial imagery); WSP USA, 2018 (annotations).

#### 2.13.3 LAND ZONING

The Airport property is classified as "Residential Single-Family District R-5" per the zoning plan of the CoSA. The San Antonio Unified Development Code § 35-310.05 describes R-5 Residential Single-Family Districts as:

# 2021 San Antonio International Airport Master Plan Inventory of Existing Conditions



These districts provide areas for medium- to high-density single-family residential uses, where adequate public facilities and services exist with capacity to serve development. These districts are composed mainly of areas containing single-family dwellings and open area where similar residential development seems likely to occur. Residential single-family zoning provides minimum lot size and density requirements in order to preserve neighborhood character.

These districts implement the following policies of the master plan:

- Urban Design, Policy 1a: Based on a comprehensive land use plan, encourage more intensive
  development in and near neighborhood centers with less intensive development between
  neighborhood centers, and implement these changes through zoning.
- Urban Design, Policy 1c: Encourage patterns of urban development that provide a full range of housing choices and promote a sense of community, urban vitality and the efficient provision of infrastructure.
- Urban Design, Policy 1a: Define, preserve and promote neighborhood centers which include schools, libraries, stores, transit centers and community service facilities in accessible, pedestrian friendly environments.

This zoning is not consistent with the current land use and future plans, and there is an ongoing effort from the CoSA to make the necessary zoning corrections. Typical zoning for an active airport should be "General Industrial I-1", which is the current designation of Stinson Municipal Airport (SSF). The San Antonio Unified Development Code § 35-310.13 defines I-1 districts as:

This district accommodates areas of heavy and concentrated fabrication, manufacturing and industrial uses, which are suitable based upon adjacent land uses, access to transportation and the availability of public services and facilities. It is the intent of this district to provide an environment for industries that is unencumbered by nearby residential or commercial development. "I-1" must be located in areas where conflicts with other uses can be minimized to promote orderly transitions and buffers between uses. These districts are located for convenient access for existing and future arterial thoroughfares and railway lines. These districts are in many instances separated from residential areas by business or light industry areas or by natural barriers; where they are adjacent to residential areas, some type of artificial separation may be required. The "I-1" district implements the following policies of the master plan:

- Ensure that proposed land uses and development are compatible in their use, character and size with the site and the surrounding areas (Growth Management, Policy 1b).
- Support and encourage efforts to diversify the economic base of San Antonio (Economic Development, Policy 1e).
- Natural Resources, Policy 1g: Promote the safe storage of hazardous materials in locations that do not endanger neighborhoods.
- Natural Resources, Policy 1g: Identify and establish appropriate locations and standards for the storage of hazardous and toxic materials.
- Natural Resources, Policy 1g: Consider during the zoning process and when issuing building permits and certificates of occupancy, the proximity of residential neighborhoods to the storage of hazardous materials.



#### **General Provisions:**

- All driveways, parking areas, and pedestrian ways shall be surfaced with an all weather surface.
   Curb and gutter shall be provided where required by the street design standards.
- All delivery and freight handling areas shall be screened from the boundary of any property not zoned "L," "I-1" or "I-2."
- Sites shall not be accessed from residential streets.

The area surrounding SAT is a mix of industrial, commercial and residential areas (see Figure 2.13-3).

#### 2.14 RECYCLING PLAN

There is currently no Recycling Plan at SAT, to compare with federal, state, and local guidance and industry best practices. However, several recycling initiatives are in place at SAT; they are summarized in **Appendix 2G**.

#### 2 15 FINANCIAL INVENTORY

The CoSA's Aviation Department owns, operates, and manages the SAAS as an enterprise fund (SAAS Enterprise Fund). Enterprise funds are typically established to support government entities which provide a continuing service to the public, and rely primarily on user-generated revenue to finance or recover expenses. SAAS includes both SAT and Stinson Municipal Airport.

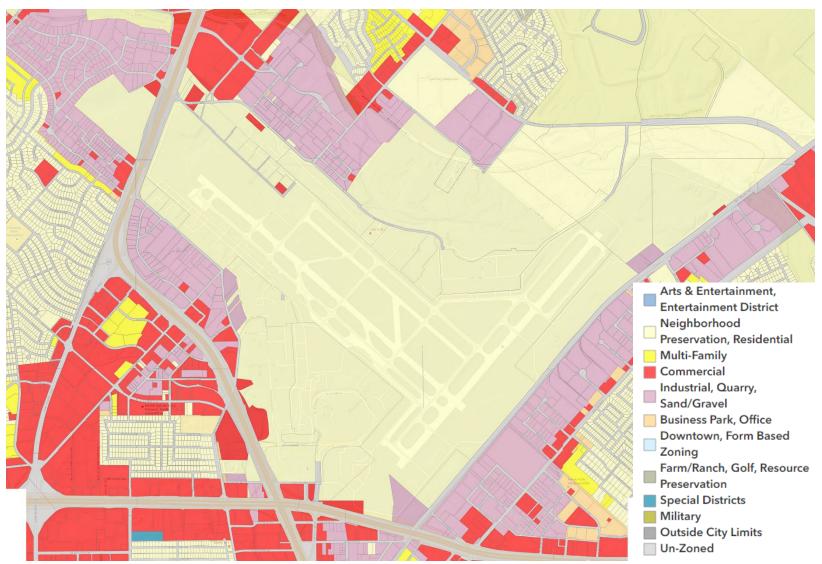
Capital projects at the Airport are funded by a combination of FAA Airport Improvement Program (AIP) grants, passenger facility charges (PFCs), Airport reserves (revenues remaining after expenses and debt service are paid), and general airport revenue bond (GARB) proceeds.

A detailed financial inventory was prepared for this study and includes a historical review of the Airport's revenues and operating expenses, AIP grants received, as well as PFCs approvals and collections. In addition, the financial inventory contains a benchmarking analysis that compares financial results at the Airport with comparable airports in Texas and in the United States and a debt capacity analysis.

The full financial inventory can be found in **Appendix 2H**.



Figure 2.13-3: Zoning of San Antonio International Airport and Vicinity



Sources: City of San Antonio, Interactive Zoning Maps, https://gis.sanantonio.gov/DSD/OneStop/Index.html, accessed 2018; WSP USA, 2018.

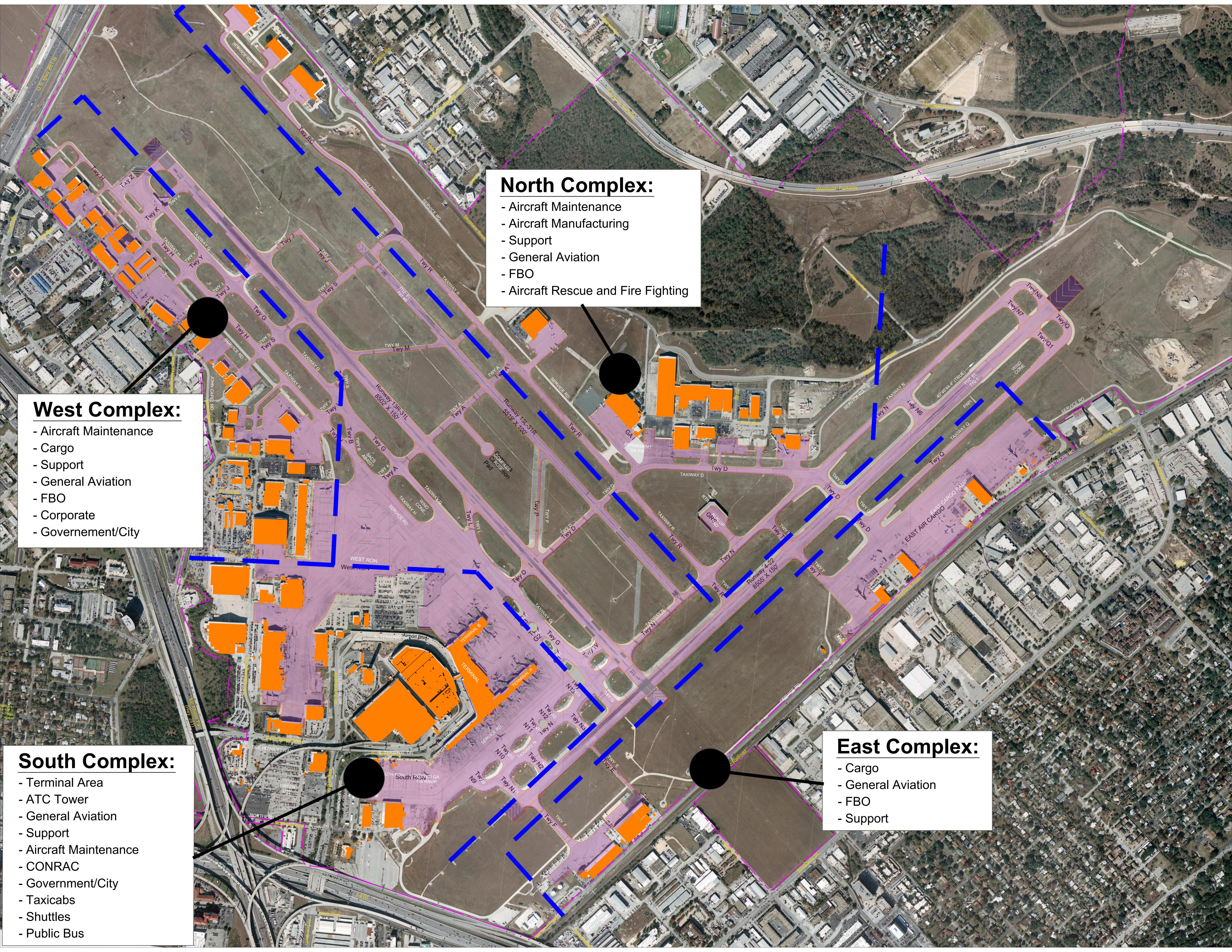
# San Antonio Airport System Strategic Development Plan

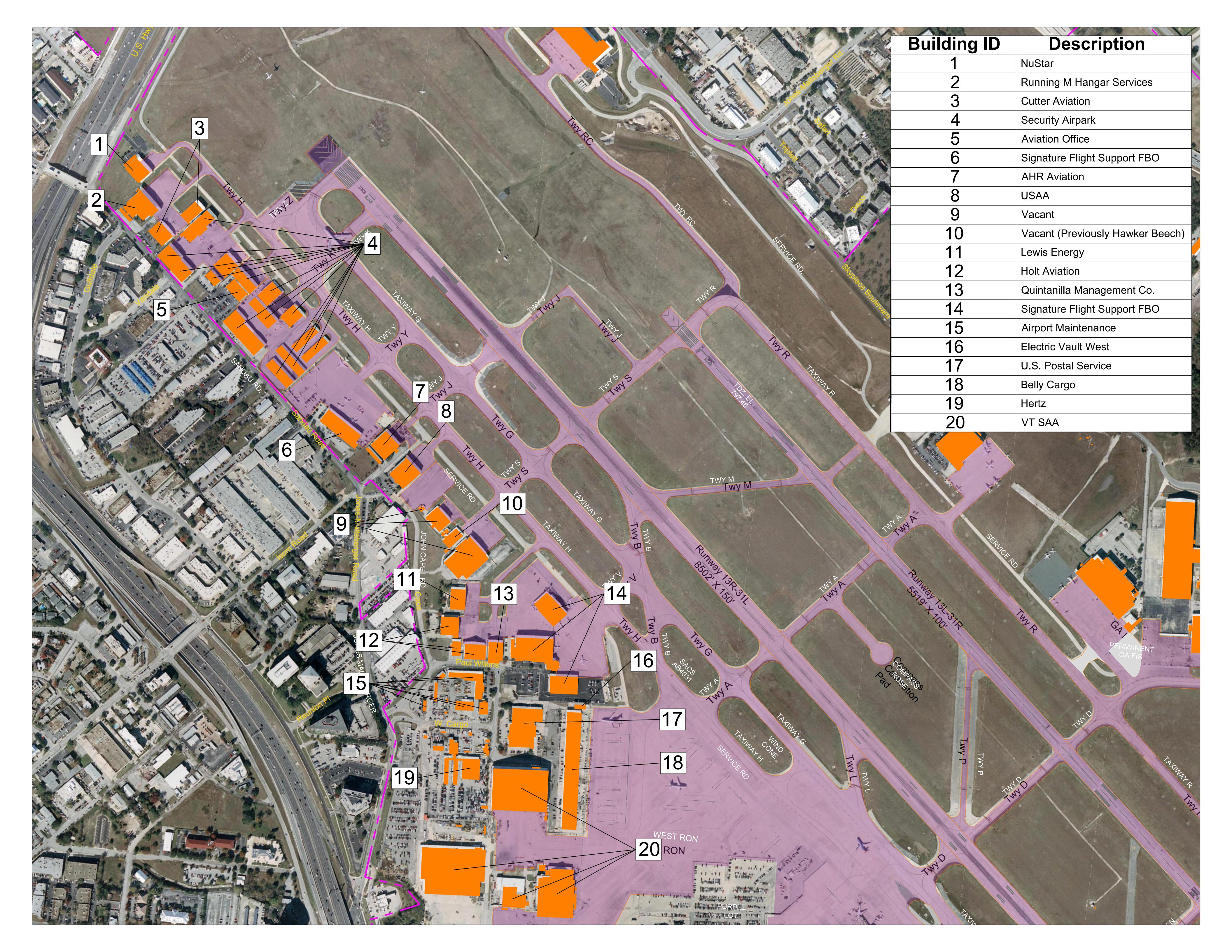
### 2021 AIRPORT MASTER PLAN

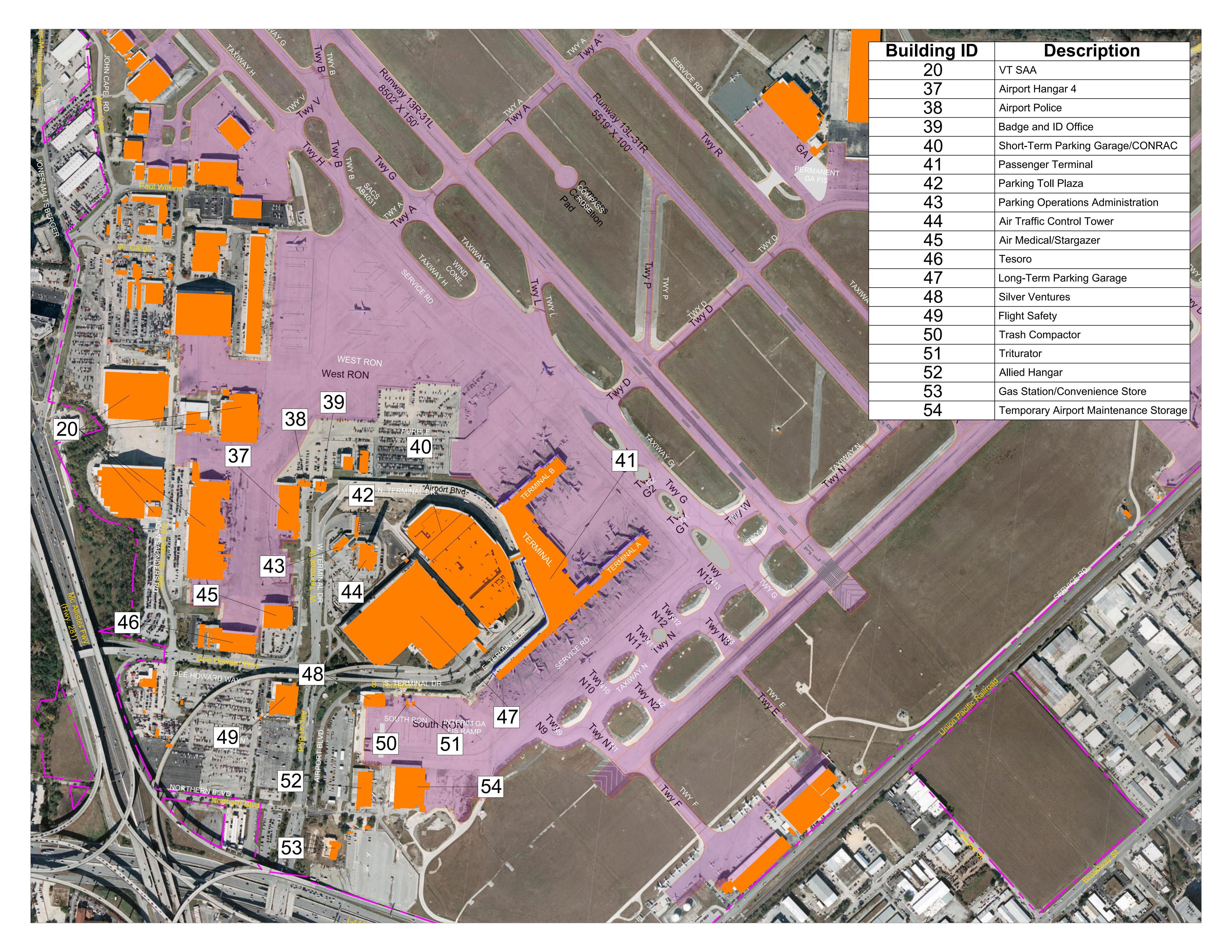
MASTER PLAN UPDATE
CHAPTER 2 – INVENTORY OF EXISTING CONDITIONS
APPENDIX 2A – EXISTING AIRPORT FACILITIES

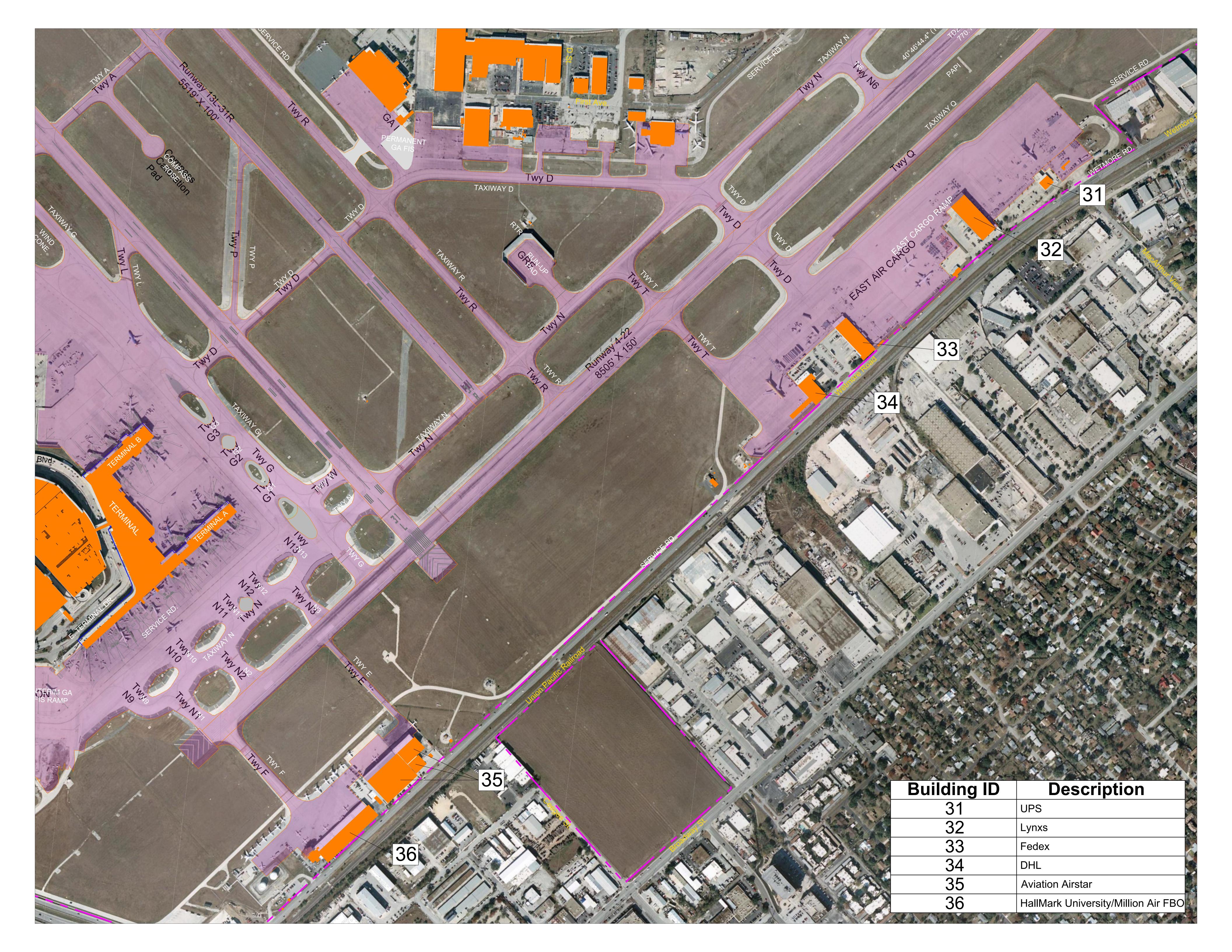


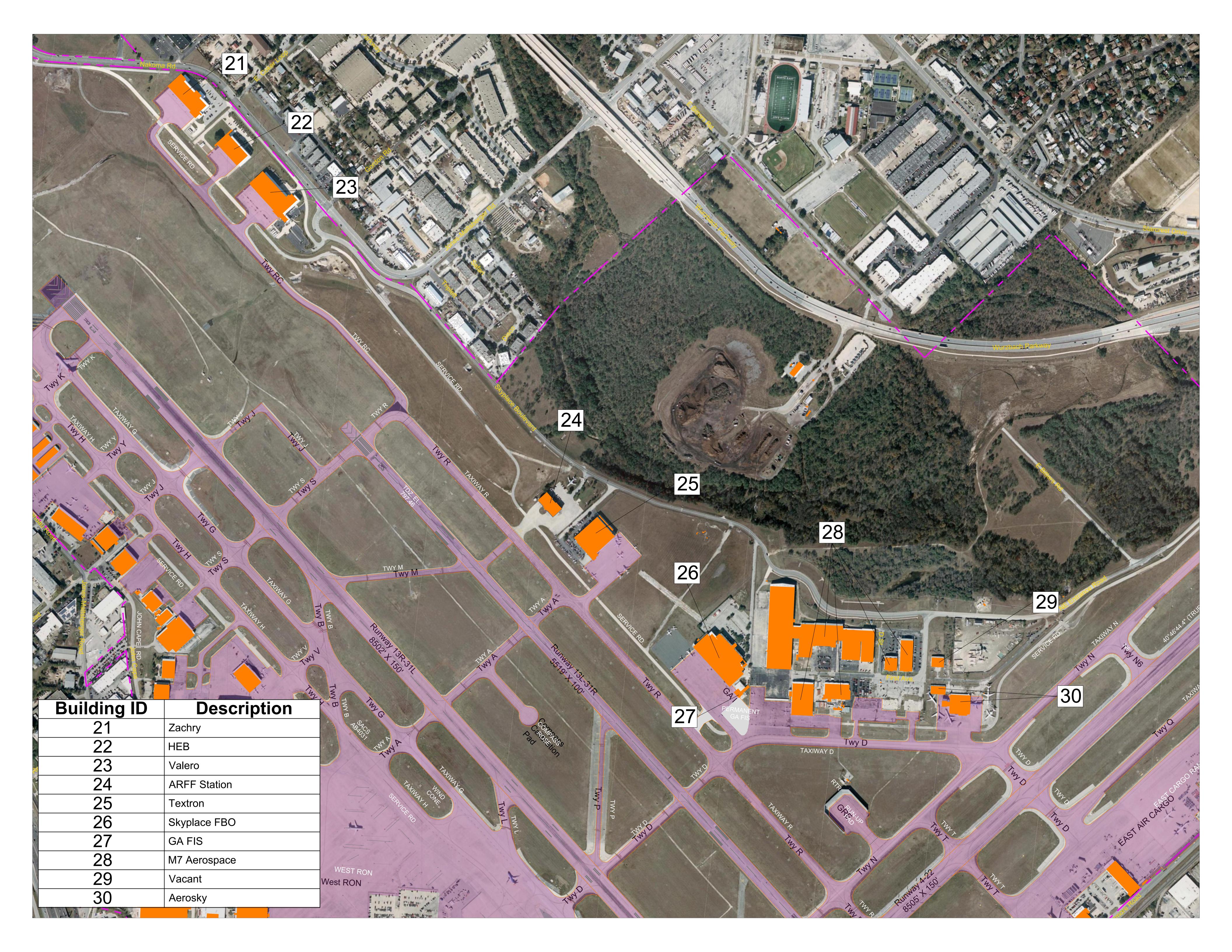


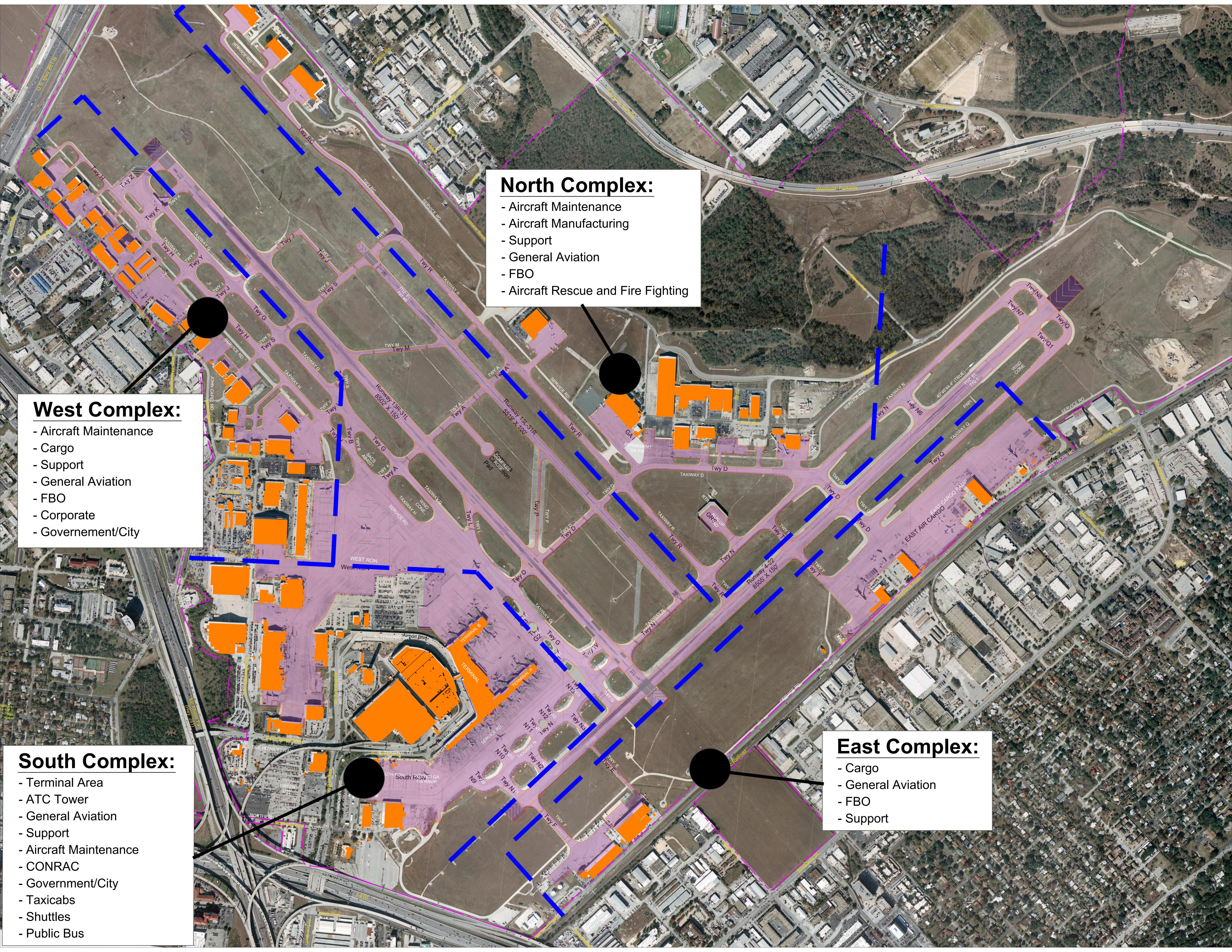








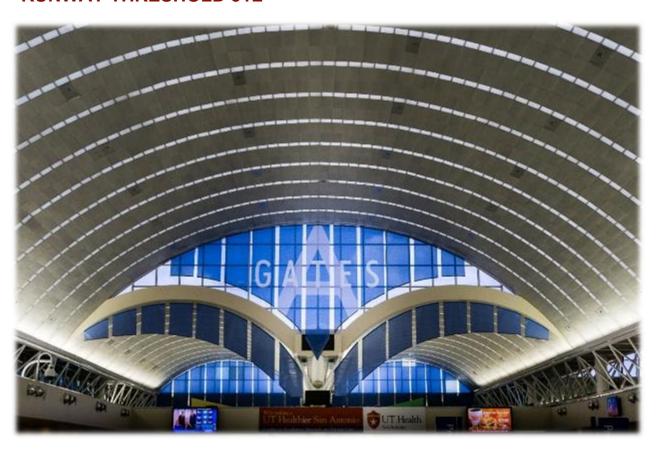




### San Antonio Airport System Strategic Development Plan

#### 2021 AIRPORT MASTER PLAN

MASTER PLAN UPDATE
CHAPTER 2 – INVENTORY OF EXISTING CONDITIONS
APPENDIX 2B – 2019 AVIATION SAFETY CONDITIONS AT
RUNWAY THRESHOLD 31L







# 2021 San Antonio International Airport Master Plan Appendices





3101 S HANLEY ROAD ST. LOUIS, MO 63143 T: 314.991.2228 | F: 314.991.2268

#### **MEMORANDUM**

TO: Gael Le Bris, WSP USA

FROM: Dave Fleet

PROJECT: SAT De-Coupling SRA Update

SUBJECT: Updated Conditions

DATE: February 4, 2019

**DISTRIBUTION:** Central File

This memorandum is a summary of the current January 2019 airfield conditions at the San Antonio International Airport (SAT) as they relate to the conditions of the airfield in 2011. A Safety Risk Assessment (SRA) was conducted in 2011 to specifically determine the aviation safety risks associated with the intersection of Runways 4-22 and 13R-31L – previously identified as Runways 3-21 and 12R-30L (see attached 2011 Aerial Photo and copy of the Draft SRA Report and Forms that were completed in 2011).

Since the original SRA was conducted, SAT has completed major airfield reconfiguration projects in order to address several deviations to the FAA design standards and remove hotspot conditions in several areas as well. Hotspot #3 was located at Taxiways K and G and Runway 13L. The reconfiguration of the taxiway infrastructure in this area improved the operating conditions such that Hotspot #3 was able to be removed. Further, the six-year construction program brought all taxiways leaving the commercial ramp up to standards and subsequently demonstrated vast improvements for the operating environment, as well as runway incursions. By meeting design standards for those taxiways into and out of the commercial ramp, particularly in the areas of Taxiways N1 through N3 along with improving access to and from Taxiway G at G1, G2, and G3, this provides a much less confusing route to and from the runways and commercial ramp. The current conditions on the airfield represent a substantially reconfigured Aircraft Operations Area (AOA) which has resulted in improved efficiency of aircraft movements and reduced the number of incursions in and around the runway intersection referred to previously (see attached aerials showing the differences in airfield geometry from 2011 to 2018 for reference). The attached graphics depict the reference of hotspots and the locations and types of incursions that have taken place - as presented it the 2018 Runway Safety Action Team (RSAT) meeting.

Finally, a table that presents the runway incursions that have occurred between 2013 and 2018, sourced from the RSAT 2018 meeting presentation. The table illustrates that with the exception of construction periods, during those years' overall incursions have dropped at SAT – with the construction activities primarily taking place in 2016, 2017 and 2018. Further, as illustrated on the attached Airport Diagram from December 2018 the number of recognized hotspots has also been reduced by one, with two remaining. This is representative of the fact that no incursions were recorded at the former Hotspot #3 in 2018 and therefore it was removed.

Page 1 of 7





The overall type of incursions that occurred near the intersection of Runway 31L and Runway 4-22 were Pilot Deviations and for the most part due to construction of the improved taxiways and as of Nov. 2018. Construction has been completed and operations are back to normal therefore these types of incursions should be reduced in 2019.

The SRA from 2011 should be formally revisited with the subject matter experts who participated in 2011 (as much as practicable) to review the SDP Phase 2 preferred airfield concept.

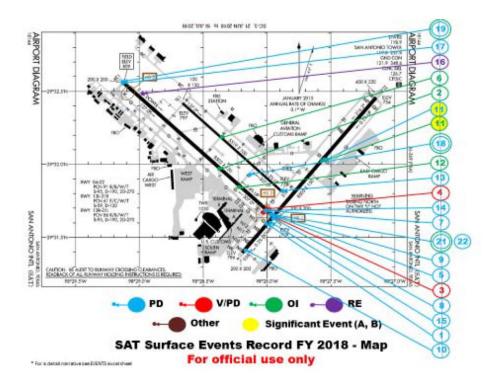






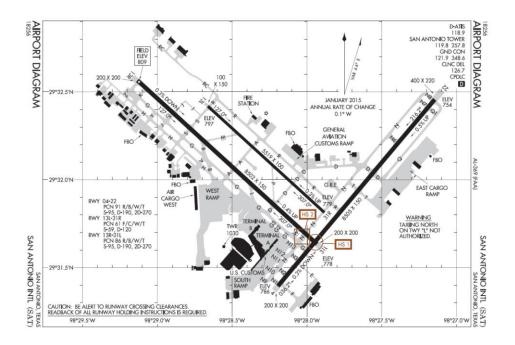
Page 4 of 7





Page 5 of 7





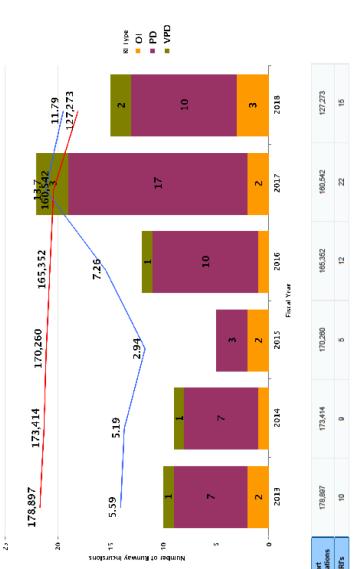
Page 6 of 7



Downloaded By: mike.moreau







Report created by Business Objects from the DMRS Universe RI Bar chart type Airport Operations total RFs

Note: This figure depicts Aircraft Operations and Aircraft Runway Incursions.

Page 1 of 1

### San Antonio Airport System Strategic Development Plan

# 2021 AIRPORT MASTER PLAN

MASTER PLAN UPDATE
CHAPTER 2 – INVENTORY OF EXISTING CONDITIONS
APPENDIX 2C – AIR TRAFFIC CONTROL ARRIVAL
PROCEDURES BY RUNWAY

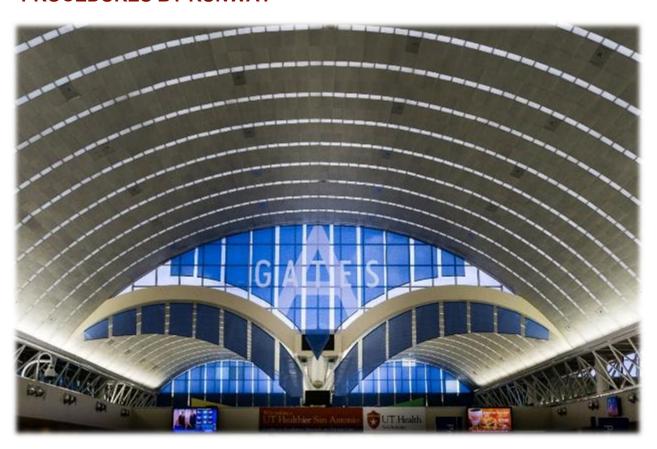






Figure 2C-1 | Runway 13 Flow – Arrivals Preferred Routing

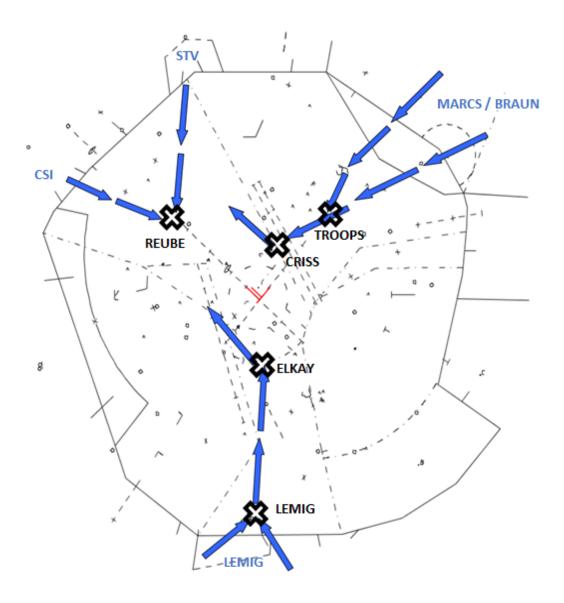




Figure 2C-2 | Runway 31 Flow – Arrivals Preferred Routing

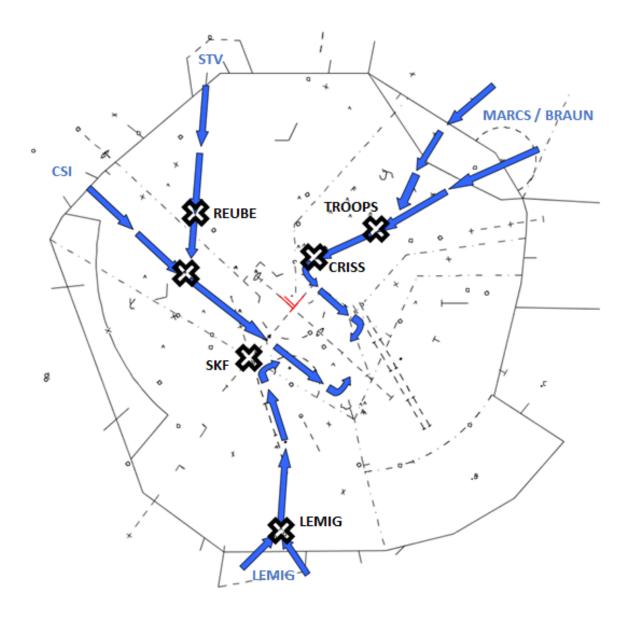




Figure 2C-3 | Runway 04 Flow – Arrivals Preferred Routing

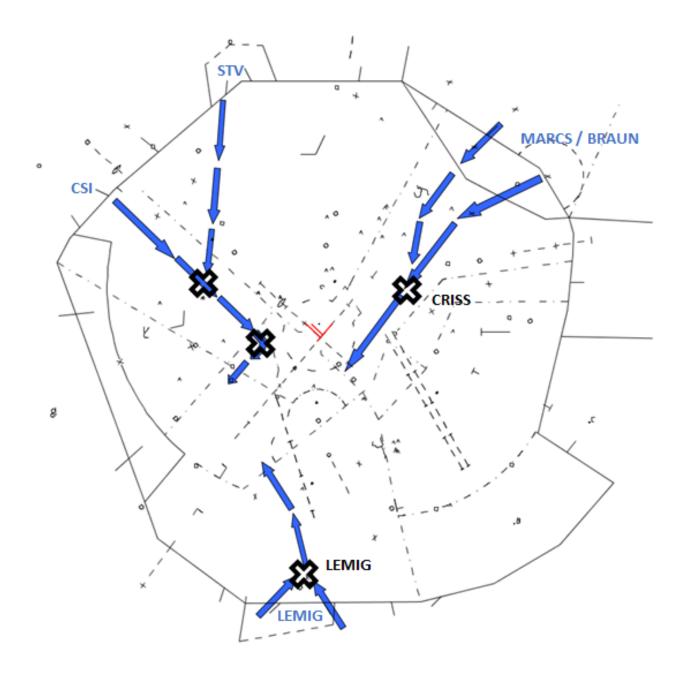
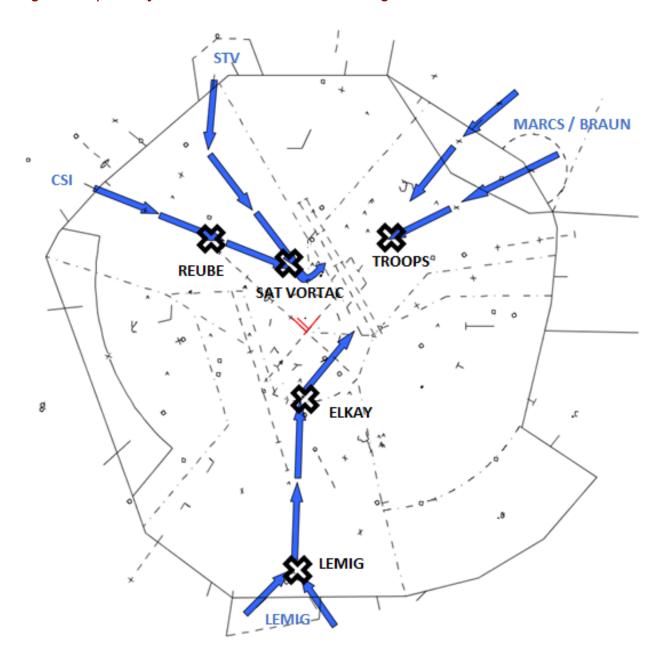




Figure 2C-4 | Runway 22 Flow - Arrivals Preferred Routing



# San Antonio Airport System Strategic Development Plan

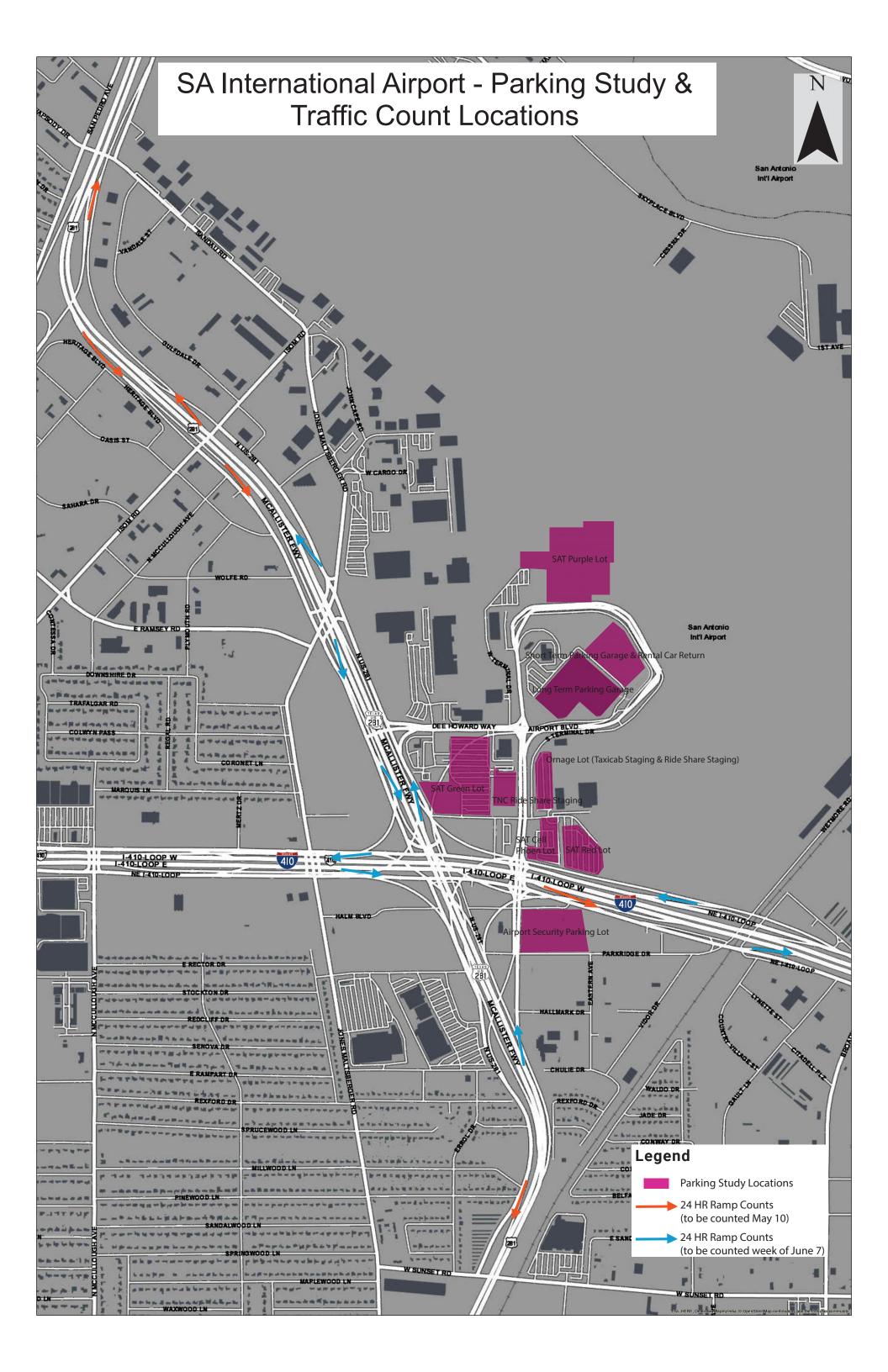
### 2021 AIRPORT MASTER PLAN

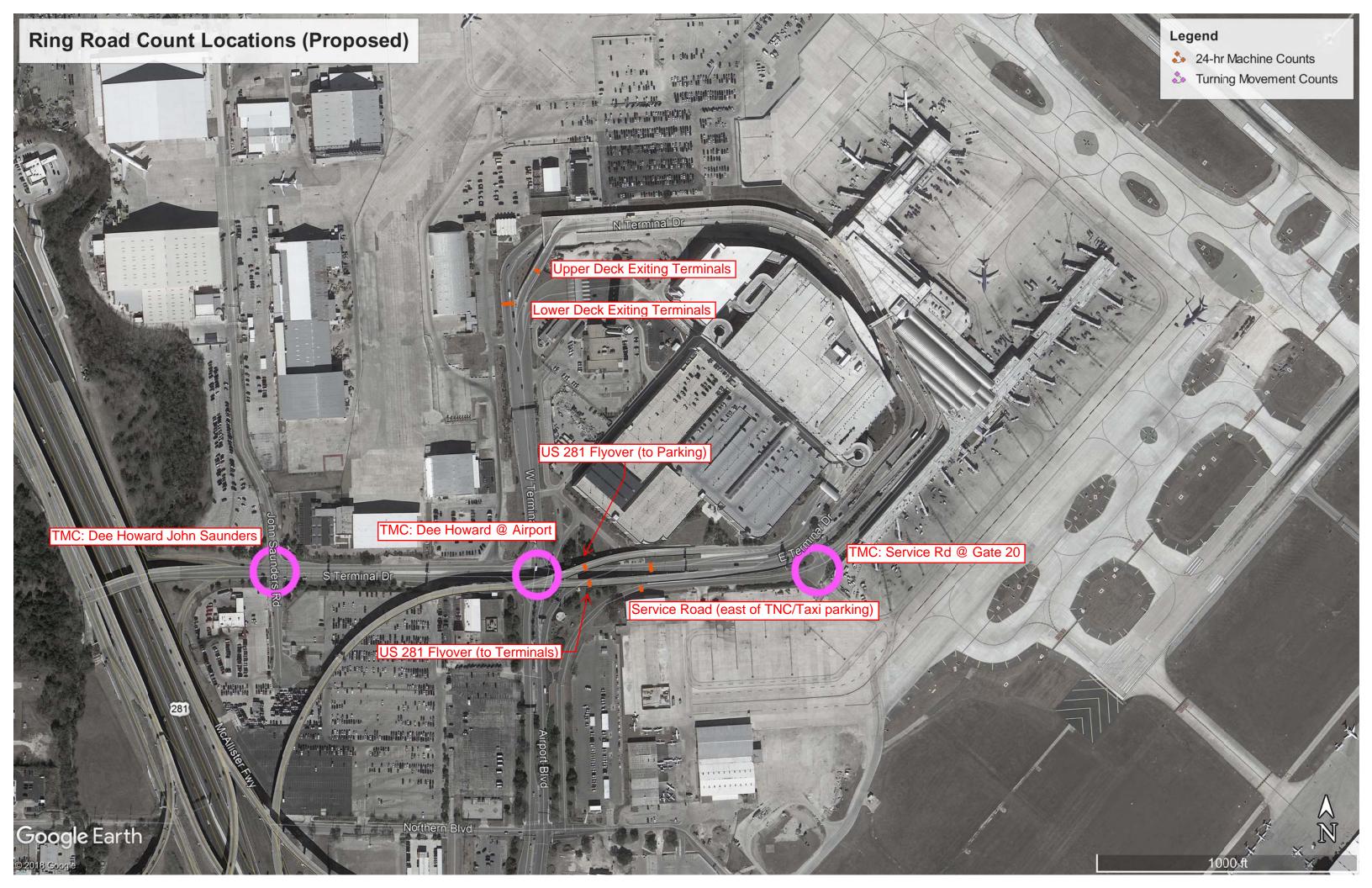
MASTER PLAN UPDATE
CHAPTER 2 – INVENTORY OF EXISTING CONDITIONS
APPENDIX 2D – VEHICULAR TRAFFIC COUNTS













North/South Street:		US 281 NE	SFR /									
East/West Street:		Jones Malt	sberger									
TOD:	AM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Greer	ne\28445 SA Ai	rport\TMCs\\01	-AM-US 281 NB
	I	Northbound Southbound				Eastbound			Westbound			
	L	JS 281 NBF	R				Jor	nes Maltsber	ger	Jon	es Maltsber	rger
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	26	84	83	0	0	0	25	22	0	0	34	6
7:15 AM	57	112	92	0	0	0	34	16	0	0	39	3
7:30 AM	53	113	83	0	0	0	43	25	0	0	60	6
7:45 AM	64	161	102	0	0	0	53	17	0	0	61	4
8:00 AM	60	173	111	0	0	0	36	27	0	0	54	1
8:15 AM	48	161	106	0	0	0	29	25	0	0	74	6
8:30 AM	40	169	107	0	0	0	35	32	0	0	61	4
8:45 AM	47	159	96	0	0	0	43	31	0	0	71	5
2-hour Total	395	1132	780	0	0	0	298	195	0	0	454	35
07:30 AM-08:30 AM	225	608	402	0	0	0	161	94	0	0	249	17

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	2	0	0	0					
7:15 AM	2	0	0	0					
7:30 AM	1	0	0	0					
7:45 AM	1	0	0	0					
8:00 AM	5	0	0	0					
8:15 AM	5	0	0	0					
8:30 AM	1	0	0	0					
8:45 AM	2	0	0	0					

			<b>1</b>	17	
0	0	0	$\leftarrow$	249	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	161	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	94	$\rightarrow$	225	608	402
	0	$\downarrow$			



North/South Street:		US 281 NE	SFR /									
East/West Street:		Jones Malt	sberger									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Greer	ne\28445 SA Ai	rport\TMCs\\01	-PM-US 281 NB
		Northbound Southbound				Eastbound			Westbound			
	J	JS 281 NBF	R				Jor	nes Maltsber	ger	Jon	es Maltsber	ger
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	46	150	45	0	0	0	95	36	0	0	91	7
4:15 PM	49	180	70	0	0	0	77	29	0	0	83	11
4:30 PM	37	203	58	0	0	0	74	29	0	0	101	8
4:45 PM	37	247	83	0	0	0	90	32	0	0	82	13
5:00 PM	49	225	87	0	0	0	73	42	0	0	102	10
5:15 PM	45	259	87	0	0	0	87	40	0	0	119	7
5:30 PM	41	203	76	0	0	0	91	43	0	0	95	9
5:45 PM	40	181	83	0	0	0	84	40	0	0	83	8
2-hour Total	344	1648	589	0	0	0	671	291	0	0	756	73
04:30 PM-05:30 PM	168	934	315	0	0	0	324	143	0	0	404	38

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			<b>1</b>	38	
0	0	0	$\leftarrow$	404	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	324	$\uparrow$	$\leftarrow$	<b>↑</b>	$\rightarrow$
	143	$\rightarrow$	168	934	315
	0	$\downarrow$			



North/South Street:		/ US 281 S	BFR									
East/West Street:		Jones Malt	sberger									
TOD:	AM	Date:	8-May-18 Synchro Node:					Raw Data:	C:\Ethan Greer	ne\28445 SA Ai	rport\TMCs\\02	-AM-US 281 SB
		Northbound	d	:	Southbound	d		Eastbound			Westbound	
				l	US 281 SBFI	₹	Jor	nes Maltsber	ger	Jon	es Maltsbei	rger
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	10	17	39	0	39	26	25	37	0
7:15 AM	0	0	0	5	23	46	0	44	31	33	72	0
7:30 AM	0	0	0	7	22	55	0	59	47	39	61	0
7:45 AM	0	0	0	8	31	45	0	63	38	44	91	0
8:00 AM	0	0	0	11	30	54	0	51	18	38	73	0
8:15 AM	0	0	0	7	16	38	0	48	20	55	66	0
8:30 AM	0	0	0	9	33	47	0	63	13	45	54	0
8:45 AM	0	0	0	7	33	36	0	64	15	47	70	0
2-hour Total	0	0	0	64	205	360	0	431	208	326	524	0
07:30 AM-08:30 AM	0	0	0	33	99	192	0	221	123	176	291	0

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	2	8	0	0					
7:15 AM	2	11	0	0					
7:30 AM	1	10	0	0					
7:45 AM	1	7	0	0					
8:00 AM	5	12	0	0					
8:15 AM	5	11	0	0					
8:30 AM	1	13	0	0					
8:45 AM	2	11	0	0					

			1	0	
192	99	33	←	291	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	176	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	221	$\rightarrow$	0	0	0
	123	$\downarrow$			



North/South Street:		/ US 281 S	BFR									
East/West Street:		Jones Malt	sberger									
TOD:	PM	Date:	8-May-18 Synchro Node:					Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\02	-PM-US 281 SB
		Northbound	k	:	Southbound	d		Eastbound			Westbound	
				l	US 281 SBFF	₹	Jor	nes Maltsber	ger	Jon	es Maltsber	ger
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	7	81	27	0	123	31	61	71	0
4:15 PM	0	0	0	12	49	31	0	92	26	58	73	0
4:30 PM	0	0	0	4	75	34	0	99	26	82	55	0
4:45 PM	0	0	0	5	73	39	0	116	20	58	61	0
5:00 PM	0	0	0	9	128	53	0	106	29	68	84	0
5:15 PM	0	0	0	5	77	45	0	135	24	85	76	0
5:30 PM	0	0	0	7	77	45	0	108	22	66	72	0
5:45 PM	0	0	0	7	50	34	0	119	17	59	66	0
2-hour Total	0	0	0	56	610	308	0	898	195	537	558	0
04:30 PM-05:30 PM	0	0	0	23	353	171	0	456	99	293	276	0

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	21	0	0					
4:15 PM	0	18	0	0					
4:30 PM	0	13	0	0					
4:45 PM	0	13	0	0					
5:00 PM	0	16	0	0					
5:15 PM	0	18	0	0					
5:30 PM	0	12	0	0					
5:45 PM	0	14	0	0					

			<b>↑</b>	0	
171	353	23	<b>←</b>	276	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	293	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	456	$\rightarrow$	0	0	0
	99	$\downarrow$			



North/South Street:												
East/West Street:		Sandau Rd										
TOD:	AM	Date:	te: 8-May-18 Synchro Node:					Raw Data: C:\Ethan Greene\28445 SA Airport\TMCs\\03-AM-US 281 N				
		Northbound	nd Southbound				Eastbound		Westbound			
								Sandau Rd			Sandau Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	0	0	0	22	64	0	0	20	13
7:15 AM	0	0	0	0	0	0	28	82	0	0	26	11
7:30 AM	0	0	0	0	0	0	50	100	0	0	24	14
7:45 AM	0	0	0	0	0	0	43	134	0	0	30	15
8:00 AM	0	0	0	0	0	0	46	110	0	0	38	24
8:15 AM	0	0	0	0	0	0	32	81	0	0	33	28
8:30 AM	0	0	0	0	0	0	32	70	0	0	23	30
8:45 AM	0	0	0	0	0	0	37	65	0	0	27	24
2-hour Total	0	0	0	0	0	0	290	706	0	0	221	159
07:30 AM-08:30 AM	0	0	0	0	0	0	171	425	0	0	125	81

Pedestrians									
	NB SB EB WE								
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			1	81	
0	0	0	$\leftarrow$	125	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	171	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	425	$\rightarrow$	0	0	0
	0	$\downarrow$			



North/South Street:												
East/West Street:		Sandau Rd										
TOD:	PM	Date:	ate: 8-May-18 Synchro Node:					Raw Data: C:\Ethan Greene\28445 SA Airport\TMCs\\03-PM-US 281				-PM-US 281 NB
		Northbound	t	Southbound				Eastbound		Westbound		
								Sandau Rd			Sandau Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	0	0	0	65	32	0	0	64	72
4:15 PM	0	0	0	0	0	0	54	42	0	0	58	61
4:30 PM	0	0	0	0	0	0	58	41	0	0	65	90
4:45 PM	0	0	0	0	0	0	38	44	0	0	60	104
5:00 PM	0	0	0	0	0	0	51	49	0	0	97	118
5:15 PM	0	0	0	0	0	0	37	27	0	0	93	102
5:30 PM	0	0	0	0	0	0	37	34	0	0	80	94
5:45 PM	0	0	0	0	0	0	41	35	0	0	60	79
2-hour Total	0	0	0	0	0	0	381	304	0	0	577	720
04:30 PM-05:30 PM	0	0	0	0	0	0	184	161	0	0	315	414

Pedestrians								
	NB SB EB WB							
4:00 PM	0	0	0	0				
4:15 PM	0	0	0	0				
4:30 PM	0	0	0	0				
4:45 PM	0	0	0	0				
5:00 PM	0	0	0	0				
5:15 PM	0	0	0	0				
5:30 PM	0	0	0	0				
5:45 PM	0	0	0	0				

			1	414	
0	0	0	$\leftarrow$	315	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	184	<b></b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	161	$\rightarrow$	0	0	0
	0	$\downarrow$			



North/South Street:		US 281 FR	S 281 FR / US 281 SBFR									
East/West Street:		Sandau Rd										
TOD:	AM	Date:	8-May-18 Synchro Node: Raw Data: C:\Ethan Greene\284						ne\28445 SA Ai	\28445 SA Airport\TMCs\\04-AM-US 281 SB		
		Northbound	ound Southbound				Eastbound		Westbound			
		US 281 FR			US 281 SBFI	3		Sandau Rd			Sandau Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	8	11	17	41	21	8	3	33	2	2	5	7
7:15 AM	6	6	30	64	40	15	0	38	3	3	18	3
7:30 AM	7	4	33	50	43	10	0	55	8	6	18	7
7:45 AM	12	4	49	67	49	15	4	66	7	4	23	1
8:00 AM	10	7	29	51	33	18	9	67	13	7	27	4
8:15 AM	12	7	17	44	26	17	2	49	7	2	26	2
8:30 AM	11	6	17	39	19	16	3	35	10	4	17	3
8:45 AM	15	4	24	67	16	15	0	29	4	8	20	2
2-hour Total	81	49	216	423	247	114	21	372	54	36	154	29
07:30 AM-08:30 AM	41	22	128	212	151	60	15	237	35	19	94	14

Pedestrians									
	NB SB EB WE								
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			<b>↑</b>	14	
60	151	212	←	94	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	19	
	15	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	15 237	$\uparrow \\ \rightarrow$	← 41	↑ 22	→ 128



North/South Street:		US 281 FR	S 281 FR / US 281 SBFR									
East/West Street:		Sandau Rd										
TOD:	PM	Date:	te: 8-May-18 Synchro Node: Raw D						C:\Ethan Greene\28445 SA Airport\TMCs\\04-PM-US 281 SB			
		Northbound	bound Southbound				Eastbound		Westbound			
		US 281 FR			US 281 SBFI	3		Sandau Rd			Sandau Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	7	8	20	39	41	18	2	26	17	10	52	6
4:15 PM	5	4	17	42	25	14	1	38	7	10	35	2
4:30 PM	6	7	18	54	51	18	5	22	19	16	55	1
4:45 PM	4	5	20	33	28	10	1	35	15	13	51	4
5:00 PM	3	3	12	46	41	19	0	38	24	19	81	0
5:15 PM	6	2	13	22	54	16	0	32	10	10	77	1
5:30 PM	9	7	17	29	28	12	2	29	17	14	59	3
5:45 PM	7	2	13	19	33	14	0	34	7	10	40	1
2-hour Total	47	38	130	284	301	121	11	254	116	102	450	18
04:30 PM-05:30 PM	19	17	63	155	174	63	6	127	68	58	264	6

Pedestrians									
	NB	NB SB EB							
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			1	6	
63	174	155	$\leftarrow$	264	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	58	
	6	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	127	$\rightarrow$	19	17	63
	68	$\downarrow$			



North/South Street:		US 281 NB	FR/									
East/West Street:		Isom Rd										
TOD:	AM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Greer	ne\28445 SA Ai	rport\TMCs\\05	-AM-US 281 NE
		Northbound	k	Southbound				Eastbound		Westbound		
	l	JS 281 NBF	R					Isom Rd			Isom Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	18	4	15	0	0	0	27	44	0	0	11	0
7:15 AM	25	3	23	0	0	0	20	36	0	0	12	3
7:30 AM	25	6	22	0	0	0	25	57	0	0	17	9
7:45 AM	28	9	26	0	0	0	16	78	0	0	28	4
8:00 AM	26	2	23	0	0	0	6	91	0	0	21	2
8:15 AM	31	9	29	0	0	0	8	79	0	0	26	7
8:30 AM	26	6	37	0	0	0	7	55	0	0	31	6
8:45 AM	32	4	13	0	0	0	16	68	0	0	30	11
2-hour Total	211	43	188	0	0	0	125	508	0	0	176	42
07:30 AM-08:30 AM	110	26	100	0	0	0	55	305	0	0	92	22

Pedestrians									
	NB	EB	WB						
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			1	22	
0	0	0	$\leftarrow$	92	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	55	$\uparrow$	$\leftarrow$	<b>↑</b>	$\rightarrow$
	305	$\rightarrow$	110	26	100
	0	$\downarrow$			



North/South Street:		US 281 NB	FR /									
East/West Street:		Isom Rd										
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\05	-PM-US 281 NB
		Northbound	d	Southbound				Eastbound		Westbound		
	ι	JS 281 NBFI	3					Isom Rd			Isom Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	28	17	13	0	0	0	66	18	0	0	45	15
4:15 PM	23	24	15	0	0	0	50	32	0	0	43	17
4:30 PM	26	46	11	0	0	0	47	21	0	0	62	18
4:45 PM	32	48	12	0	0	0	35	29	0	0	51	16
5:00 PM	62	68	4	0	0	0	69	24	0	0	91	23
5:15 PM	51	64	11	0	0	0	47	29	0	0	61	13
5:30 PM	42	49	9	0	0	0	35	19	0	0	59	27
5:45 PM	41	41	8	0	0	0	35	25	0	0	37	20
2-hour Total	305	357	83	0	0	0	384	197	0	0	449	149
04:30 PM-05:30 PM	171	226	38	0	0	0	198	103	0	0	265	70

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			<b>1</b>	70	
0	0	0	$\leftarrow$	265	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	198	$\uparrow$	$\leftarrow$	<b>↑</b>	$\rightarrow$
	103	$\rightarrow$	171	226	38
	0	$\downarrow$			



North/South Street:		/ US 281 S	BFR									
East/West Street:		Isom Rd										
TOD:	AM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\06	-AM-US 281 SB
	I	Northbound	d		Southbound	d		Eastbound		Westbound		
					US 281 SBFF	₹		Isom Rd			Isom Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	22	5	63	0	45	8	5	27	0
7:15 AM	0	0	0	16	3	66	0	43	17	10	28	0
7:30 AM	0	0	0	23	7	46	0	57	16	11	33	0
7:45 AM	0	0	0	33	4	49	0	60	15	15	37	0
8:00 AM	0	0	0	53	5	40	0	46	15	13	28	0
8:15 AM	0	0	0	47	2	28	0	44	14	16	44	0
8:30 AM	0	0	0	21	2	37	0	36	11	25	33	0
8:45 AM	0	0	0	35	6	45	0	49	17	20	38	0
2-hour Total	0	0	0	250	34	374	0	380	113	115	268	0
07:30 AM-08:30 AM	0	0	0	156	18	163	0	207	60	55	142	0

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			<b>1</b>	0	
163	18	156	<b>←</b>	142	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	55	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	207	$\rightarrow$	0	0	0
	60	$\downarrow$			



North/South Street:		/ US 281 S	BFR									
East/West Street:		Isom Rd										
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\06	-PM-US 281 SB
		Northbound	t	Southbound				Eastbound			Westbound	
				US 281 SBFR				Isom Rd			Isom Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	9	3	26	0	72	26	31	41	0
4:15 PM	0	0	0	10	4	29	0	63	20	30	36	0
4:30 PM	0	0	0	8	3	33	0	71	25	36	52	0
4:45 PM	0	0	0	7	1	35	0	54	30	34	46	0
5:00 PM	0	0	0	7	4	37	0	92	36	73	72	0
5:15 PM	0	0	0	11	6	26	0	56	25	41	68	0
5:30 PM	0	0	0	7	1	13	0	46	25	38	64	0
5:45 PM	0	0	0	6	0	17	0	53	17	27	54	0
2-hour Total	0	0	0	65	22	216	0	507	204	310	433	0
04:30 PM-05:30 PM	0	0	0	33	14	131	0	273	116	184	238	0

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			1	0	
131	14	33	<b>←</b>	238	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	184	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	273	$\rightarrow$	0	0	0
	116	$\downarrow$			



North/South Street:		US 281 NB	FR /									
East/West Street:		Nakoma St	:									
TOD:	AM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\07	-AM-US 281 NE
	ı	Northbound	k	:	Southbound	t		Eastbound			Westbound	
	l	JS 281 NBFI	R					Nakoma St			Nakoma St	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	94	28	113	0	0	0	32	38	0	0	104	5
7:15 AM	59	42	120	0	0	0	37	23	0	0	163	6
7:30 AM	99	54	158	0	0	0	50	23	0	0	165	4
7:45 AM	82	57	170	0	0	0	55	28	0	0	196	8
8:00 AM	110	47	121	0	0	0	50	28	0	0	185	4
8:15 AM	114	51	128	0	0	0	56	27	0	0	133	9
8:30 AM	77	64	114	0	0	0	39	28	0	0	157	13
8:45 AM	75	68	136	0	0	0	44	38	0	0	147	12
2-hour Total	710	411	1060	0	0	0	363	233	0	0	1250	61
07:30 AM-08:30 AM	405	209	577	0	0	0	211	106	0	0	679	25

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	28	0	0	0					
7:15 AM	28	0	0	0					
7:30 AM	22	0	0	0					
7:45 AM	17	0	0	0					
8:00 AM	21	0	0	0					
8:15 AM	26	0	0	0					
8:30 AM	18	0	0	0					
8:45 AM	36	0	0	0					

			1	25	
0	0	0	<b>←</b>	679	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	211	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	106	$\rightarrow$	405	209	577
	0	$\downarrow$			



North/South Street:		US 281 NB	FR /									
East/West Street:		Nakoma St										
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\07	-PM-US 281 NB
		Northbound	l	•	Southbound	d		Eastbound		Westbound		
	ι	JS 281 NBFI	₹					Nakoma St			Nakoma St	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	72	75	154	0	0	0	54	39	0	0	160	18
4:15 PM	77	83	164	0	0	0	66	29	0	0	157	13
4:30 PM	91	104	189	0	0	0	65	35	0	0	144	16
4:45 PM	87	145	203	0	0	0	58	23	0	0	150	11
5:00 PM	88	121	220	0	0	0	73	21	0	0	198	35
5:15 PM	105	141	263	0	0	0	59	19	0	0	217	22
5:30 PM	92	155	217	0	0	0	65	33	0	0	136	14
5:45 PM	103	139	218	0	0	0	46	33	0	0	148	22
2-hour Total	715	963	1628	0	0	0	486	232	0	0	1310	151
04:30 PM-05:30 PM	371	511	875	0	0	0	255	98	0	0	709	84

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	37	0	0	0					
4:15 PM	31	0	0	0					
4:30 PM	44	0	0	0					
4:45 PM	33	0	0	0					
5:00 PM	34	0	0	0					
5:15 PM	25	0	0	0					
5:30 PM	28	0	0	0					
5:45 PM	35	0	0	0					

			1	84	
0	0	0	<b>←</b>	709	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	255	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	98	$\rightarrow$	371	511	875
	0	$\downarrow$			



North/South Street:		/ US 281 S	BFR									
East/West Street:		Nakoma St	t									
TOD:	AM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\08	-AM-US 281 SB
		Northbound	d	:	Southbound	d		Eastbound		Westbound		
				l	US 281 SBFF	₹		Nakoma St			Nakoma St	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	26	113	37	0	38	54	113	94	0
7:15 AM	0	0	0	15	145	36	0	47	66	135	92	0
7:30 AM	0	0	0	12	138	52	0	69	81	162	120	0
7:45 AM	0	0	0	14	166	55	0	67	77	186	118	0
8:00 AM	0	0	0	14	150	60	0	63	74	154	116	0
8:15 AM	0	0	0	22	133	45	0	61	57	129	135	0
8:30 AM	0	0	0	24	126	41	0	62	64	137	99	0
8:45 AM	0	0	0	15	122	36	0	53	58	123	91	0
2-hour Total	0	0	0	142	1093	362	0	460	531	1139	865	0
07:30 AM-08:30 AM	0	0	0	62	587	212	0	260	289	631	489	0

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	28	98	0	0					
7:15 AM	28	102	0	0					
7:30 AM	22	134	0	0					
7:45 AM	17	132	0	0					
8:00 AM	21	158	0	0					
8:15 AM	26	164	0	0					
8:30 AM	18	151	0	0					
8:45 AM	36	162	0	0					

			1	0	
212	587	62	<b>←</b>	489	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	631	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	260	$\rightarrow$	0	0	0
	289	$\downarrow$			



North/South Street:		/ US 281 S	BFR									
East/West Street:		Nakoma St	:									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Greer	ne\28445 SA Ai	rport\TMCs\\08	-PM-US 281 SB
		Northbound	ł	:	Southbound	d		Eastbound			Westbound	
				l	US 281 SBFF	₹		Nakoma St			Nakoma St	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	22	88	43	0	59	70	154	92	0
4:15 PM	0	0	0	18	96	39	0	75	65	135	90	0
4:30 PM	0	0	0	16	94	39	0	87	80	143	111	0
4:45 PM	0	0	0	11	84	28	0	81	56	115	126	0
5:00 PM	0	0	0	9	95	27	0	71	100	183	130	0
5:15 PM	0	0	0	10	100	29	0	78	60	174	129	0
5:30 PM	0	0	0	15	85	42	0	84	51	108	112	0
5:45 PM	0	0	0	15	80	30	0	63	53	137	122	0
2-hour Total	0	0	0	116	722	277	0	598	535	1149	912	0
04:30 PM-05:30 PM	0	0	0	46	373	123	0	317	296	615	496	0

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	37	164	0	0					
4:15 PM	31	169	0	0					
4:30 PM	44	171	0	0					
4:45 PM	33	173	0	0					
5:00 PM	34	176	0	0					
5:15 PM	25	183	0	0					
5:30 PM	28	178	0	0					
5:45 PM	35	159	0	0					

			1	0	
123	373	46	←	496	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	615	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	317	$\rightarrow$	0	0	0
	296	$\downarrow$			



North/South Street:		US 281 NE	FR /									
East/West Street:		/ Loop 410	) WBFR									
TOD:	AM	Date:	8-Ma	ay-18	Synchro	Node:		Raw Data:	C:\Ethan Green	eene\28445 SA Airport\TMCs\\09-AM-US 281 NE		
		Northbound	nd Southbound				Eastbound			Westbound		
	Ų	JS 281 NBF	R							Lo	op 410 WB	FR
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	285	110
7:15 AM	0	0	0	0	0	0	0	0	0	0	295	122
7:30 AM	0	0	0	0	0	0	0	0	0	0	368	142
7:45 AM	0	0	0	0	0	0	0	0	0	0	339	174
8:00 AM	0	0	0	0	0	0	0	0	0	0	277	220
8:15 AM	0	0	0	0	0	0	0	0	0	0	285	160
8:30 AM	0	0	0	0	0	0	0	0	0	0	302	173
8:45 AM	0	0	0	0	0	0	0	0	0	0	266	153
2-hour Total	0	0	0	0	0	0	0	0	0	0	2417	1254
07:30 AM-08:30 AM	0	0	0	0	0	0	0	0	0	0	1269	696

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			1	696	
0	0	0	$\leftarrow$	1269	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	0	0
	0	$\downarrow$			



North/South Street:		US 281 NE	FR /									
East/West Street:		/ Loop 410	) WBFR									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\09	-PM-US 281 NB
	I	Northbound	d		Southbound	d		Eastbound		Westbound		
	L	JS 281 NBF	R							Lo	op 410 WB	FR
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	320	84
4:15 PM	0	0	0	0	0	0	0	0	0	0	277	143
4:30 PM	0	0	0	0	0	0	0	0	0	0	305	187
4:45 PM	0	0	0	0	0	0	0	0	0	0	330	215
5:00 PM	0	0	0	0	0	0	0	0	0	0	364	167
5:15 PM	0	0	0	0	0	0	0	0	0	0	321	212
5:30 PM	0	0	0	0	0	0	0	0	0	0	317	162
5:45 PM	0	0	0	0	0	0	0	0	0	0	298	134
2-hour Total	0	0	0	0	0	0	0	0	0	0	2532	1304
04:30 PM-05:30 PM	0	0	0	0	0	0	0	0	0	0	1320	781

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			<b>1</b>	781	
0	0	0	←	1320	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	0	0
	0	$\downarrow$			



North/South Street:		/ US 281 S	BFR									
East/West Street:		/ Loop 410	) WBFR									
TOD:	AM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Gree	ne\28445 SA Ai	rport\TMCs\\10	-AM-US 281 SB
		Northbound	t		Southbound	d		Eastbound			Westbound	
				US 281 SBFR						Lo	op 410 WB	FR
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	0	0	36	0	0	0	0	314	0
7:15 AM	0	0	0	0	0	40	0	0	0	0	304	0
7:30 AM	0	0	0	0	0	39	0	0	0	0	391	0
7:45 AM	0	0	0	0	0	46	0	0	0	0	372	0
8:00 AM	0	0	0	0	0	52	0	0	0	0	302	0
8:15 AM	0	0	0	0	0	43	0	0	0	0	316	0
8:30 AM	0	0	0	0	0	58	0	0	0	0	338	0
8:45 AM	0	0	0	0	0	60	0	0	0	0	289	0
2-hour Total	0	0	0	0	0	374	0	0	0	0	2626	0
07:30 AM-08:30 AM	0	0	0	0	0	180	0	0	0	0	1381	0

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	0	0	0	0					
7:15 AM	0	3	0	0					
7:30 AM	0	1	0	0					
7:45 AM	0	1	0	0					
8:00 AM	0	2	0	0					
8:15 AM	0	1	0	0					
8:30 AM	0	1	0	0					
8:45 AM	0	3	0	0					

			<b>↑</b>	0	
180	0	0	<b>←</b>	1381	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	0	0
	0	$\downarrow$			



North/South Street:		/ US 281 S	BFR									
East/West Street:		/ Loop 410	) WBFR									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\10	-PM-US 281 SB
		Northbound	t	:	Southbound	t		Eastbound			Westbound	
				l	US 281 SBFI	₹				Lo	op 410 WB	FR
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	0	0	96	0	0	0	0	332	0
4:15 PM	0	0	0	0	0	71	0	0	0	0	291	0
4:30 PM	0	0	0	0	0	78	0	0	0	0	330	0
4:45 PM	0	0	0	0	0	63	0	0	0	0	340	0
5:00 PM	0	0	0	0	0	92	0	0	0	0	374	0
5:15 PM	0	0	0	0	0	68	0	0	0	0	334	0
5:30 PM	0	0	0	0	0	80	0	0	0	0	332	0
5:45 PM	0	0	0	0	0	69	0	0	0	0	309	0
2-hour Total	0	0	0	0	0	617	0	0	0	0	2642	0
04:30 PM-05:30 PM	0	0	0	0	0	301	0	0	0	0	1378	0

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	1	0	0					
4:15 PM	0	3	0	0					
4:30 PM	0	3	0	0					
4:45 PM	0	4	0	0					
5:00 PM	0	5	0	0					
5:15 PM	0	5	0	0					
5:30 PM	0	2	0	0					
5:45 PM	0	3	0	0					

			<b>↑</b>	0	
301	0	0	<b>←</b>	1378	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	0	0
	0	$\downarrow$			



North/South Street:		US 281 NE	BFR /									
East/West Street:		Loop 410 E	BFR /									
TOD:	AM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\11	-AM-US 281 NE
		Northbound	rthbound Southbound				Eastbound			Westbound		
	J	JS 281 NBF	R				L	oop 410 EBF	R			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	0	0	0	0	195	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	200	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	203	0	0	0	0
7:45 AM	0	0	1	0	0	0	0	253	0	0	0	0
8:00 AM	0	0	3	0	0	0	0	263	0	0	0	0
8:15 AM	0	0	3	0	0	0	0	235	0	0	0	0
8:30 AM	0	0	1	0	0	0	0	243	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	244	0	0	0	0
2-hour Total	0	0	8	0	0	0	0	1836	0	0	0	0
07:30 AM-08:30 AM	0	0	7	0	0	0	0	954	0	0	0	0

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	11	0	0	0					
7:15 AM	10	0	0	0					
7:30 AM	7	0	0	0					
7:45 AM	11	0	0	0					
8:00 AM	16	0	0	0					
8:15 AM	15	0	0	0					
8:30 AM	7	0	0	0					
8:45 AM	7	0	0	0					

			$\uparrow$	0	
0	0	0	$\leftarrow$	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	954	$\rightarrow$	0	0	7
	0	$\downarrow$			



North/South Street:		US 281 NE	SFR /									
East/West Street:		Loop 410 E	BFR /									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\11	-PM-US 281 NB
		Northbound	k	Southbound				Eastbound			Westbound	
	Ų	JS 281 NBF	R				L	oop 410 EBF	R			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	1	0	0	0	0	272	0	0	0	0
4:15 PM	0	0	3	0	0	0	0	304	0	0	0	0
4:30 PM	0	0	3	0	0	0	0	334	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	320	0	0	0	0
5:00 PM	0	0	2	0	0	0	0	339	0	0	0	0
5:15 PM	0	0	1	0	0	0	0	367	0	0	0	0
5:30 PM	0	0	1	0	0	0	0	262	0	0	0	0
5:45 PM	0	0	2	0	0	0	0	255	0	0	0	0
2-hour Total	0	0	13	0	0	0	0	2453	0	0	0	0
04:30 PM-05:30 PM	0	0	6	0	0	0	0	1360	0	0	0	0

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	13	0	0	0					
4:15 PM	16	0	0	0					
4:30 PM	19	0	0	0					
4:45 PM	22	0	0	0					
5:00 PM	24	0	0	0					
5:15 PM	17	0	0	0					
5:30 PM	14	0	0	0					
5:45 PM	13	0	0	0					

			1	0	
0	0	0	←	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	1360	$\rightarrow$	0	0	6
	0	$\downarrow$			



North/South Street:		/ US 281 S	BFR									
East/West Street:		Loop 410 E	BFR /									
TOD:	AM	Date:	: 8-May-18 Synchro Node:					Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\12	-AM-US 281 SB
		Northbound	t	:	Southbound	t		Eastbound			Westbound	
				US 281 SBFR			L	Loop 410 EBFR				
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	0	0	0	0	198	51	0	0	0
7:15 AM	0	0	0	0	0	0	0	205	77	0	0	0
7:30 AM	0	0	0	0	0	0	0	206	90	0	0	0
7:45 AM	0	0	0	0	0	0	0	263	95	0	0	0
8:00 AM	0	0	0	0	0	0	0	265	113	0	0	0
8:15 AM	0	0	0	0	0	0	0	238	113	0	0	0
8:30 AM	0	0	0	0	0	0	0	252	106	0	0	0
8:45 AM	0	0	0	0	0	0	0	246	113	0	0	0
2-hour Total	0	0	0	0	0	0	0	1873	758	0	0	0
07:30 AM-08:30 AM	0	0	0	0	0	0	0	972	411	0	0	0

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			1	0	
0	0	0	←	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	972	$\rightarrow$	0	0	0
	411	$\downarrow$			



North/South Street:		/ US 281 S	BFR									
East/West Street:		Loop 410 E	BFR /									
TOD:	PM	Date:	Date: 8-May-18 Synchro Node:					Raw Data:	C:\Ethan Gree	ne\28445 SA Aii	rport\TMCs\\12	PM-US 281 SB
		Northbound	orthbound Southbound			d		Eastbound			Westbound	l
				ı	US 281 SBFF	₹	Loop 410 EBFR					
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	0	0	0	0	266	79	0	0	0
4:15 PM	0	0	0	0	0	0	0	305	95	0	0	0
4:30 PM	0	0	0	0	0	0	0	335	114	0	0	0
4:45 PM	0	0	0	0	0	0	0	328	104	0	0	0
5:00 PM	0	0	0	0	0	0	0	348	114	0	0	0
5:15 PM	0	0	0	0	0	0	0	382	104	0	0	0
5:30 PM	0	0	0	0	0	0	0	282	107	0	0	0
5:45 PM	0	0	0	0	0	0	0	258	117	0	0	0
2-hour Total	0	0	0	0	0	0	0	2504	834	0	0	0
04:30 PM-05:30 PM	0	0	0	0	0	0	0	1393	436	0	0	0

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			1	0	
0	0	0	←	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	1393	$\rightarrow$	0	0	0
	436	$\downarrow$			



North/South Street:		Jones Malt	sberger									
East/West Street:		/ Loop 410	) WBFR									
TOD:	AM	Date:	8-Ma	ay-18	Synchro	Node:		Raw Data:	C:\Ethan Greer	ne\28445 SA Ai	rport\TMCs\\13	-AM-Loop 410
	I	Northbound	t	:	Southbound	ł		Eastbound		Westbound		
	Jon	es Maltsbei	rger	Jon	es Maltsbei	ger				Lo	op 410 WB	FR
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	33	45	0	0	34	35	0	0	0	17	44	16
7:15 AM	40	39	0	0	58	35	0	0	0	19	44	19
7:30 AM	47	54	0	0	78	42	0	0	0	28	83	17
7:45 AM	64	69	0	0	57	36	0	0	0	23	114	27
8:00 AM	43	69	0	0	72	24	0	0	0	16	94	13
8:15 AM	57	51	0	0	57	19	0	0	0	17	51	21
8:30 AM	53	62	0	0	61	39	0	0	0	16	60	18
8:45 AM	60	71	0	0	52	18	0	0	0	17	51	12
2-hour Total	397	460	0	0	469	248	0	0	0	153	541	143
07:30 AM-08:30 AM	211	243	0	0	264	121	0	0	0	84	342	78

Pedestrians								
	NB	SB	EB	WB				
7:00 AM	0	0	0	12				
7:15 AM	0	0	0	10				
7:30 AM	0	0	0	13				
7:45 AM	0	0	0	20				
8:00 AM	0	0	0	29				
8:15 AM	0	0	0	24				
8:30 AM	0	0	0	20				
8:45 AM	0	0	0	18				

			1	78	
121	264	0	$\leftarrow$	342	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	84	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	211	243	0
	0	$\downarrow$			



North/South Street:		Jones Malt	sberger									
East/West Street:		/ Loop 410	) WBFR									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\13	-PM-Loop 410 \
	1	Northbound	d	;	Southbound	d		Eastbound		Westbound		
	Jon	es Maltsbe	rger	Jon	es Maltsbei	rger				Lo	op 410 WB	FR
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	105	91	0	0	67	35	0	0	0	18	51	20
4:15 PM	106	86	0	0	54	29	0	0	0	27	60	15
4:30 PM	82	101	0	0	49	27	0	0	0	19	60	15
4:45 PM	92	116	0	0	61	21	0	0	0	34	69	14
5:00 PM	105	107	0	0	85	28	0	0	0	39	70	11
5:15 PM	104	139	0	0	73	19	0	0	0	37	120	21
5:30 PM	95	123	0	0	76	20	0	0	0	31	127	18
5:45 PM	85	104	0	0	63	30	0	0	0	40	93	20
2-hour Total	774	867	0	0	528	209	0	0	0	245	650	134
04:30 PM-05:30 PM	383	463	0	0	268	95	0	0	0	129	319	61

Pedestrians								
	NB	SB	EB	WB				
4:00 PM	0	0	0	12				
4:15 PM	0	0	0	21				
4:30 PM	0	0	0	13				
4:45 PM	0	0	0	10				
5:00 PM	0	0	0	22				
5:15 PM	0	0	0	16				
5:30 PM	0	0	0	21				
5:45 PM	0	0	0	19				

			1	61	
95	268	0	<b>←</b>	319	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	129	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	383	463	0
	0	$\downarrow$			



North/South Street:		Jones Mal	es Maltsberger									
East/West Street:		Loop 410 E	BFR /									
TOD:	AM	Date:	e: 8-May-18 Synchro Node:					Raw Data: C:\Ethan Greene\28445 SA Airport\TMCs\\14-AM-Loop 410				-AM-Loop 410 I
		Northbound	t	:	Southbound	t		Eastbound		Westbound		
	Jon	es Maltsbe	rger	Jon	es Maltsbe	rger	L	oop 410 EBF	R			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	59	19	22	28	0	13	27	31	0	0	0
7:15 AM	0	66	31	42	42	0	10	23	24	0	0	0
7:30 AM	0	85	35	44	54	0	19	24	40	0	0	0
7:45 AM	0	112	53	38	44	0	27	27	47	0	0	0
8:00 AM	0	82	33	37	52	0	26	23	37	0	0	0
8:15 AM	0	86	30	26	47	0	20	39	32	0	0	0
8:30 AM	0	87	27	35	45	0	21	33	30	0	0	0
8:45 AM	0	112	29	32	42	0	18	28	30	0	0	0
2-hour Total	0	689	257	276	354	0	154	224	271	0	0	0
07:30 AM-08:30 AM	0	365	151	145	197	0	92	113	156	0	0	0

Pedestrians									
	NB SB								
7:00 AM	0	0	9	0					
7:15 AM	0	0	12	0					
7:30 AM	0	0	16	0					
7:45 AM	0	0	28	0					
8:00 AM	0	0	19	0					
8:15 AM	0	0	14	0					
8:30 AM	0	0	10	0					
8:45 AM	0	0	21	0					

			$\uparrow$	0	
0	197	145	$\leftarrow$	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	92	$\uparrow$	←	$\uparrow$	$\rightarrow$
	92 113	$\uparrow \\ \rightarrow$	0	↑ 365	→ 151



North/South Street:		Jones Malt	sberger									
East/West Street:		Loop 410 E	BFR /									
TOD:	PM	Date: 8-May-18 Synchro Node:						Raw Data:	C:\Ethan Greer	ne\28445 SA Ai	rport\TMCs\\14	-PM-Loop 410 I
	I	Northbound	k		Southbound	t		Eastbound			Westbound	j
	Jon	es Maltsbei	rger	Jon	es Maltsbei	rger	L	oop 410 EBF	R			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	152	65	39	46	0	37	52	47	0	0	0
4:15 PM	0	156	57	24	54	0	34	68	52	0	0	0
4:30 PM	0	145	72	26	47	0	45	55	38	0	0	0
4:45 PM	0	152	57	27	71	0	49	55	51	0	0	0
5:00 PM	0	161	62	44	77	0	52	88	48	0	0	0
5:15 PM	0	202	95	40	75	0	46	68	56	0	0	0
5:30 PM	0	160	71	35	78	0	36	70	51	0	0	0
5:45 PM	0	145	49	25	82	0	36	50	50	0	0	0
2-hour Total	0	1273	528	260	530	0	335	506	393	0	0	0
04:30 PM-05:30 PM	0	660	286	137	270	0	192	266	193	0	0	0

Pedestrians								
	NB	SB	EB	WB				
4:00 PM	0	0	31	0				
4:15 PM	0	0	29	0				
4:30 PM	0	0	50	0				
4:45 PM	0	0	61	0				
5:00 PM	0	0	74	0				
5:15 PM	0	0	53	0				
5:30 PM	0	0	31	0				
5:45 PM	0	0	28	0				

			1	0	
0	270	137	←	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	192	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	266	$\rightarrow$	0	660	286
	193	$\downarrow$			



North/South Street:		Wetmore I	₹d									
East/West Street:		Loop 410 E	BFR /									
TOD:	AM	Date:	rate: 8-May-18 Synchro Node:					Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\15	-AM-Loop 410 I
		Northbound	orthbound Southbound				Eastbound			Westbound		
	\	Netmore Ro	b	١	Wetmore Ro	d	L	oop 410 EBF	R			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	67	0	0	132	0	123	0	23	0	0	0
7:15 AM	0	59	0	0	164	0	137	0	17	0	0	0
7:30 AM	0	60	0	0	175	0	116	0	14	0	0	0
7:45 AM	0	75	0	0	148	0	133	0	15	0	0	0
8:00 AM	0	56	0	0	125	0	106	0	17	0	0	0
8:15 AM	0	58	0	0	102	0	112	0	17	0	0	0
8:30 AM	0	49	0	0	68	0	110	0	23	0	0	0
8:45 AM	0	68	0	0	105	0	125	0	18	0	0	0
2-hour Total	0	492	0	0	1019	0	962	0	144	0	0	0
07:30 AM-08:30 AM	0	249	0	0	550	0	467	0	63	0	0	0

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			个	0	
0	550	0	←	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	467	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	249	0
	63	$\downarrow$			



North/South Street:		Wetmore	Rd									
East/West Street:		Loop 410 E	BFR /									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Greer	ene\28445 SA Airport\TMCs\\15-PM-Loop 410 I		
		Northbound	orthbound Southbound				Eastbound		Westbound			
	\	Netmore R	d	'	Wetmore Ro	d	L	oop 410 EBF	R			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	105	0	0	65	0	249	0	15	0	0	0
4:15 PM	0	92	0	0	74	0	255	0	11	0	0	0
4:30 PM	0	95	0	0	75	0	242	0	15	0	0	0
4:45 PM	0	129	0	0	61	0	239	0	6	0	0	0
5:00 PM	0	113	0	0	109	0	222	0	7	0	0	0
5:15 PM	0	127	0	0	83	0	233	0	8	0	0	0
5:30 PM	0	123	0	0	64	0	251	0	8	0	0	0
5:45 PM	0	96	0	0	59	0	223	0	7	0	0	0
2-hour Total	0	880	0	0	590	0	1914	0	77	0	0	0
04:30 PM-05:30 PM	0	464	0	0	328	0	936	0	36	0	0	0

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			<b>1</b>	0	
0	328	0	$\leftarrow$	0	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	936	$\uparrow$	$\leftarrow$	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	464	0
	36	$\downarrow$			



North/South Street:		Wetmore I	₹d									
East/West Street:		/ Loop 410	) WBFR									
TOD:	AM	Date:	8-Ma	8-May-18 Synchro Node:				Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\16	-AM-Loop 410
		Northbound	ł		Southbound	t		Eastbound			Westbound	
	١	Netmore Ro	b	,	Wetmore Ro	d				Lo	op 410 WB	FR
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	120	207	3	178	0	0	0	0	0	0	0
7:15 AM	0	167	262	3	212	0	0	0	0	0	0	0
7:30 AM	0	155	299	4	178	0	0	0	0	0	0	0
7:45 AM	0	171	276	3	209	0	0	0	0	0	0	0
8:00 AM	0	130	215	5	179	0	0	0	0	0	0	0
8:15 AM	0	108	222	2	153	0	0	0	0	0	0	0
8:30 AM	0	71	176	7	164	0	0	0	0	0	0	0
8:45 AM	0	102	177	7	188	0	0	0	0	0	0	0
2-hour Total	0	1024	1834	34	1461	0	0	0	0	0	0	0
07:30 AM-08:30 AM	0	564	1012	14	719	0	0	0	0	0	0	0

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			1	0	
0	719	14	<b>←</b>	0	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	564	1012
	0	$\downarrow$			



North/South Street:		Wetmore I	Rd										
East/West Street:		/ Loop 410	) WBFR										
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	eene\28445 SA Airport\TMCs\\16-PM-Loop 410 \			
	I	Northbound	k	:	Southbound	d		Eastbound		Westbound			
	\	Netmore Ro	d	1	Wetmore Ro	d				Lo	op 410 WB	FR	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
4:00 PM	0	52	131	7	330	0	0	0	0	0	0	0	
4:15 PM	0	76	141	6	357	0	0	0	0	0	0	0	
4:30 PM	0	82	148	2	325	0	0	0	0	0	0	0	
4:45 PM	0	60	153	5	370	0	0	0	0	0	0	0	
5:00 PM	0	89	150	5	340	0	0	0	0	0	0	0	
5:15 PM	0	95	135	7	360	0	0	0	0	0	0	0	
5:30 PM	0	75	109	3	349	0	0	0	0	0	0	0	
5:45 PM	0	52	117	5	351	0	0	0	0	0	0	0	
2-hour Total	0	581	1084	40	2782	0	0	0	0	0	0	0	
04:30 PM-05:30 PM	0	326	586	19	1395	0	0	0	0	0	0	0	

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			1	0	
0	1395	19	$\leftarrow$	0	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	326	586
	0	$\downarrow$			



North/South Street:		Wetmore	Rd									
East/West Street:		Wurzbach	Pkwy /									
TOD:	AM	Date:	Date: 8-May-18 Synchro Node:					Raw Data: C:\Ethan Greene\28445 SA Airport\TMCs\\17-AM-Wurzbac				
		Northbound	lorthbound Southbound				Eastbound			Westbound		
	١	Wetmore R	d	,	Wetmore Rd		W	/urzbach Pkv	vy			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	22	147	0	0	480	43	17	0	47	0	0	0
7:15 AM	24	176	0	0	502	28	19	0	32	0	0	0
7:30 AM	27	170	0	0	594	44	21	0	26	0	0	0
7:45 AM	45	170	0	0	505	35	26	0	29	0	0	0
8:00 AM	29	179	0	0	435	29	34	0	14	0	0	0
8:15 AM	34	158	0	0	355	25	26	0	22	0	0	0
8:30 AM	32	171	0	0	364	24	25	0	20	0	0	0
8:45 AM	33	203	0	0	321	30	16	0	17	0	0	0
2-hour Total	246	1374	0	0	3556	258	184	0	207	0	0	0
07:30 AM-08:30 AM	135	677	0	0	1889	133	107	0	91	0	0	0

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			<b>1</b>	0	
133	1889	0	<b>←</b>	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	107	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	107 0	$\uparrow \\ \rightarrow$	← 135	↑ 677	→ 0



North/South Street:		Wetmore	Rd									
East/West Street:		Wurzbach	Pkwy /									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:	Raw Data: C:\Ethan Greene\28445 SA Airport\TMCs\\17			-PM-Wurzbach		
		Northbound	ound Southbound				Eastbound			Westbound		
	\	Wetmore R	d	١	Wetmore Rd		W	/urzbach Pkv	vy			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	138	305	0	0	217	39	23	0	42	0	0	0
4:15 PM	137	397	0	0	232	20	37	0	33	0	0	0
4:30 PM	135	360	0	0	237	32	30	0	39	0	0	0
4:45 PM	120	350	0	0	222	35	24	0	33	0	0	0
5:00 PM	127	368	0	0	221	34	22	0	40	0	0	0
5:15 PM	136	475	0	0	179	18	36	0	26	0	0	0
5:30 PM	120	387	0	0	185	38	35	0	28	0	0	0
5:45 PM	141	379	0	0	150	28	16	0	28	0	0	0
2-hour Total	1054	3021	0	0	1643	244	223	0	269	0	0	0
04:30 PM-05:30 PM	518	1553	0	0	859	119	112	0	138	0	0	0

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			<b>↑</b>	0	
119	859	0	$\leftarrow$	0	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	112	<b>1</b>	,	<b>1</b>	,
	112		<b>←</b>	1	$\rightarrow$
	0	$\rightarrow$	518	1553	→ 0



North/South Street:		Wetmore I	Rd									
East/West Street:		/ Wurbach	ո Pkwy									
TOD:	AM	Date:	8-Ma	8-May-18 Synchro Node:			Raw Data: C:\Ethan Greene\28445 SA Airport\TMCs\\			rport\TMCs\\18	-AM-Wurzbach	
		Northbound	k	:	Southbound	t		Eastbound			Westbound	
	١	Netmore Ro	d	١	Wetmore Ro	d				V	/urbach Pkv	vy
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	30	152	0	0	450	101	0	0	0	32	0	72
7:15 AM	34	190	0	0	448	101	0	0	0	32	0	63
7:30 AM	39	199	0	0	464	93	0	0	0	53	0	88
7:45 AM	40	202	0	0	427	118	0	0	0	46	0	106
8:00 AM	32	209	0	0	384	116	0	0	0	48	0	108
8:15 AM	45	164	0	0	319	90	0	0	0	36	0	72
8:30 AM	52	172	0	0	316	72	0	0	0	40	0	78
8:45 AM	48	229	0	0	296	84	0	0	0	42	0	74
2-hour Total	320	1517	0	0	3104	775	0	0	0	329	0	661
07:30 AM-08:30 AM	156	774	0	0	1594	417	0	0	0	183	0	374

Pedestrians								
	NB	SB	EB	WB				
7:00 AM	0	0	0	0				
7:15 AM	0	0	0	0				
7:30 AM	0	0	0	0				
7:45 AM	0	0	0	0				
8:00 AM	0	0	0	0				
8:15 AM	0	0	0	0				
8:30 AM	0	0	0	0				
8:45 AM	0	0	0	0				

			<b>1</b>	374	
417	1594	0	$\leftarrow$	0	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	183	
	0	$\uparrow$	$\leftarrow$	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	156	774	0
	0	$\downarrow$			

North/South Street:		Wetmore I	Rd										
East/West Street:		/ Wurbach	ո Pkwy										
TOD:	PM	Date:	8-Ma	8-May-18 Synchro Node:			Raw Data: C:\Ethan Greene\2			ne\28445 SA Ai	\28445 SA Airport\TMCs\\18-PM-Wurzbach		
		Northbound	k	:	Southbound	d		Eastbound			Westbound		
	١	Netmore Ro	d	١	Wetmore Ro	d				V	/urbach Pkv	/y	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
4:00 PM	53	388	0	0	213	50	0	0	0	92	0	45	
4:15 PM	61	466	0	0	205	51	0	0	0	87	0	51	
4:30 PM	63	455	0	0	215	65	0	0	0	110	0	47	
4:45 PM	86	423	0	0	225	82	0	0	0	128	0	52	
5:00 PM	94	447	0	0	203	94	0	0	0	132	0	50	
5:15 PM	90	531	0	0	189	62	0	0	0	133	0	36	
5:30 PM	89	497	0	0	180	70	0	0	0	124	0	50	
5:45 PM	116	463	0	0	162	62	0	0	0	112	0	42	
2-hour Total	652	3670	0	0	1592	536	0	0	0	918	0	373	
04:30 PM-05:30 PM	333	1856	0	0	832	303	0	0	0	503	0	185	

Pedestrians								
	NB	SB	EB	WB				
4:00 PM	0	0	0	0				
4:15 PM	0	0	0	0				
4:30 PM	0	0	0	0				
4:45 PM	0	0	0	0				
5:00 PM	0	0	0	0				
5:15 PM	0	0	0	0				
5:30 PM	0	0	0	0				
5:45 PM	0	0	0	0				

			1	185	
303	832	0	$\leftarrow$	0	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	503	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	333	1856	0
	0	$\downarrow$			

## All Motor Vehicles Turning Movement Counts

North/South Street:		Jones Malt	sberger									
East/West Street:		/ Paul Wil	kins									
TOD:	AM	Date:	8-Ma	ay-18 Synchro Node: R				Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\19	-AM-Jones Mal
	I	Northbound	t	:	Southbound	t		Eastbound			Westbound	
	Jon	es Maltsbei	rger	Jon	es Maltsbei	rger					Paul Wilkins	3
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	59	0	9	31	0	0	0	0	11	0	7
7:15 AM	0	62	0	10	43	0	0	0	0	9	0	2
7:30 AM	0	81	0	11	48	0	0	0	0	12	0	8
7:45 AM	0	75	0	11	54	0	0	0	0	13	0	9
8:00 AM	0	97	0	8	48	0	0	0	0	18	0	6
8:15 AM	0	83	0	8	39	0	0	0	0	13	0	15
8:30 AM	0	72	1	7	38	0	0	0	0	15	0	12
8:45 AM	0	70	0	8	36	0	0	0	0	15	0	20
2-hour Total	0	599	1	72	337	0	0	0	0	106	0	79
07:30 AM-08:30 AM	0	336	0	38	189	0	0	0	0	56	0	38

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	30	0	0	0					
7:15 AM	12	0	0	0					
7:30 AM	17	0	0	0					
7:45 AM	19	0	0	0					
8:00 AM	19	0	0	0					
8:15 AM	22	0	0	0					
8:30 AM	16	0	0	0					
8:45 AM	24	0	0	0					

			<b>↑</b>	38	
0	189	38	<b>←</b>	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	56	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	336	0
	0	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 07:30 AM-08:30 AM

# All Motor Vehicles Turning Movement Counts



North/South Street:		Jones Malt	sberger									
East/West Street:		/ Paul Wil	kins									
TOD:	PM	Date:	8-Ma	May-18 Synchro Node:				Raw Data: C:\Ethan Greene\28445 SA Airport\TMCs\\19-PM-Jone				-PM-Jones Mal
	I	Northbound	k	:	Southbound	t		Eastbound			Westbound	
	Jon	es Maltsbei	rger	Jon	es Maltsbei	rger					Paul Wilkins	5
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	63	0	6	46	0	0	0	0	23	0	23
4:15 PM	0	72	0	12	54	0	0	0	0	24	0	21
4:30 PM	0	66	0	8	56	0	0	0	0	34	0	33
4:45 PM	0	78	0	19	67	0	0	0	0	15	0	27
5:00 PM	0	94	0	16	74	0	0	0	0	21	0	24
5:15 PM	0	120	0	14	53	0	0	0	0	20	0	18
5:30 PM	0	98	0	11	64	0	0	0	0	28	0	24
5:45 PM	0	62	0	13	39	0	0	0	0	22	0	18
2-hour Total	0	653	0	99	453	0	0	0	0	187	0	188
04:30 PM-05:30 PM	0	358	0	57	250	0	0	0	0	90	0	102

Pedestrians									
	NB SB EB								
4:00 PM	28	0	0	0					
4:15 PM	25	0	0	0					
4:30 PM	22	0	0	0					
4:45 PM	24	0	0	0					
5:00 PM	22	0	0	0					
5:15 PM	25	0	0	0					
5:30 PM	30	0	0	0					
5:45 PM	33	0	0	0					

			$\uparrow$	102	
0	250	57	←	0	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	90	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	358	0
	0	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 04:30 PM-05:30 PM

North/South Street:		/ John Cap	e Rd									
East/West Street:		Paul Wilkii	าร									
TOD:	AM	Date:	Date: 8-May-18 Synchro Node:					Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\20	-AM-Paul Wilki
		Northbound	k		Southbound	ł		Eastbound		Westbound		
				J	ohn Cape R	d	Paul Wilkins				Paul Wilkins	3
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	19	7
7:15 AM	0	0	0	0	0	0	0	0	0	0	13	1
7:30 AM	0	0	0	0	0	1	0	0	0	0	21	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	22	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	25	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	29	4
8:30 AM	0	0	0	0	0	1	0	0	0	0	30	0
8:45 AM	0	0	0	0	0	1	0	0	0	0	36	2
2-hour Total	0	0	0	0	0	3	0	0	0	0	195	18
07:30 AM-08:30 AM	0	0	0	0	0	1	0	0	0	0	97	8

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			<b>1</b>	8	
1	0	0	←	97	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	0	0
	0	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 07:30 AM-08:30 AM

North/South Street:		/ John Cap	e Rd									
East/West Street:		Paul Wilkin	าร									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\20	-PM-Paul Wilkii
		Northbound	k	;	Southbound	d		Eastbound			Westbound	
				J	ohn Cape R	d		Paul Wilkins			Paul Wilkins	5
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	45	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	47	0
4:30 PM	0	0	0	0	0	3	0	0	0	0	65	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	40	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	47	1
5:15 PM	0	0	0	0	0	2	0	0	0	0	37	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	52	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	40	0
2-hour Total	0	0	0	0	0	5	0	0	0	0	373	3
04:30 PM-05:30 PM	0	0	0	0	0	5	0	0	0	0	189	3

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			1	3	
5	0	0	$\leftarrow$	189	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	0	0
	0	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 04:30 PM-05:30 PM



North/South Street:		Skyplace B	yplace Blvd / Gordon Rd									
East/West Street:		Nakoma D	r									
TOD:	AM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\21	-AM-Nakoma D
		Northbound	t	Southbound				Eastbound			Westbound	
	9	Skyplace Blv	d		Gordon Rd			Nakoma Dr			Nakoma Dr	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	4	0	1	2	0	3	14	68	21	3	115	1
7:15 AM	1	0	0	0	0	2	18	90	10	5	141	0
7:30 AM	4	0	1	2	0	8	19	76	15	2	182	2
7:45 AM	4	0	0	0	0	5	18	119	14	5	162	4
8:00 AM	2	0	0	0	0	10	14	100	12	2	127	6
8:15 AM	2	0	2	0	1	7	14	78	14	1	134	2
8:30 AM	6	1	3	0	0	3	12	89	16	2	108	4
8:45 AM	5	0	0	1	1	7	12	96	9	4	88	2
2-hour Total	28	1	7	5	2	45	121	716	111	24	1057	21
07:30 AM-08:30 AM	12	0	3	2	1	30	65	373	55	10	605	14

Pedestrians									
	NB SB EB W								
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			1	14	
30	1	2	$\leftarrow$	605	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	10	
	65	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	373	$\rightarrow$	12	0	3
	55	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 07:30 AM-08:30 AM



North/South Street:		Skyplace B	lvd / Gordo	on Rd								
East/West Street:		Nakoma D	r									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Gree	ne\28445 SA Ai	rport\TMCs\\21	-PM-Nakoma D
	I	Northbound	k	:	Southbound	t		Eastbound			Westbound	
	S	kyplace Blv	d		Gordon Rd			Nakoma Dr			Nakoma Dr	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	13	0	3	1	0	4	4	109	1	0	53	0
4:15 PM	14	1	2	0	0	9	13	170	5	0	91	1
4:30 PM	16	1	3	3	0	17	4	190	3	1	97	1
4:45 PM	12	0	5	1	1	8	7	187	6	0	80	1
5:00 PM	16	0	5	7	0	15	8	258	4	0	117	1
5:15 PM	6	0	2	3	0	10	1	274	4	0	82	1
5:30 PM	26	0	5	4	0	6	1	250	3	2	80	0
5:45 PM	11	0	6	2	0	4	3	239	1	0	75	1
2-hour Total	114	2	31	21	1	73	41	1677	27	3	675	6
04:30 PM-05:30 PM	50	1	15	14	1	50	20	909	17	1	376	4

Pedestrians									
NB SB EB WB									
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			1	4	
50	1	14	<b>←</b>	376	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	1	
	20	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	909	$\rightarrow$	50	1	15
	17	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 04:30 PM-05:30 PM

North/South Street:		Entrance R	d /									
East/West Street:		Wurzbach	Pkwy /									
TOD:	AM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\22	-AM-Wurzbach
		Northbound	k	:	Southbound	d		Eastbound			Westbound	
		Entrance Ro	d				V	/urzbach Pkv	vy			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	2	0	0	0	0	134	6	0	0	0
7:15 AM	0	0	2	0	0	0	0	92	5	0	0	0
7:30 AM	0	0	3	0	0	0	0	121	4	0	0	0
7:45 AM	0	0	2	0	0	0	0	117	3	0	0	0
8:00 AM	0	0	2	0	0	0	0	91	3	0	0	0
8:15 AM	0	0	4	0	0	0	0	85	4	0	0	0
8:30 AM	0	0	3	0	0	0	0	74	0	0	0	0
8:45 AM	0	0	1	0	0	0	0	84	0	0	0	0
2-hour Total	0	0	19	0	0	0	0	798	25	0	0	0
07:30 AM-08:30 AM	0	0	11	0	0	0	0	414	14	0	0	0

Pedestrians									
	NB SB EB WB								
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			1	0	
0	0	0	←	0	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	414	$\rightarrow$	0	0	11
	14	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 07:30 AM-08:30 AM

North/South Street:		Entrance R	d /									
East/West Street:		Wurzbach	Pkwy /									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Greer	ene\28445 SA Airport\TMCs\\22-PM-Wurzbach		
		Northbound	ł		Southbound	d		Eastbound			Westbound	
		Entrance Ro	l				W	/urzbach Pkv	vy			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	8	0	0	0	0	162	1	0	0	0
4:15 PM	0	0	9	0	0	0	0	163	3	0	0	0
4:30 PM	0	0	12	0	0	0	0	130	1	0	0	0
4:45 PM	0	0	12	0	0	0	0	118	2	0	0	0
5:00 PM	0	0	8	0	0	0	0	115	3	0	0	0
5:15 PM	0	0	9	0	0	0	0	101	2	0	0	0
5:30 PM	0	0	4	0	0	0	0	108	4	0	0	0
5:45 PM	0	0	3	0	0	0	0	93	0	0	0	0
2-hour Total	0	0	65	0	0	0	0	990	16	0	0	0
04:30 PM-05:30 PM	0	0	41	0	0	0	0	464	8	0	0	0

Pedestrians									
	NB SB EB WB								
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			<b>1</b>	0	
0	0	0	←	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	464	$\rightarrow$	0	0	41
	8	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 04:30 PM-05:30 PM



North/South Street:		Bitters Rd	ters Rd / MacArthur View Airport Access									
East/West Street:		Wetmore	Vetmore Rd									
TOD:	AM	Date: 8-May-18 Synchro Node:						Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\23	-AM-Wetmore
		Northbound	k	9	Southbound	ł		Eastbound			Westbound	
		Bitters Rd		MacArthu	r View Airp	ort Access		Wetmore Ro	ł	,	Wetmore Ro	t
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	3	3	9	1	1	1	0	134	28	20	352	1
7:15 AM	9	1	7	0	1	5	1	142	51	21	427	1
7:30 AM	17	0	12	2	2	7	0	124	31	31	431	0
7:45 AM	18	1	11	2	2	1	1	140	56	50	360	1
8:00 AM	10	0	11	2	3	9	0	116	39	56	320	0
8:15 AM	9	0	9	0	1	2	0	111	27	33	267	0
8:30 AM	5	0	11	2	1	1	0	110	31	36	231	0
8:45 AM	8	0	18	0	0	1	0	128	25	45	218	1
2-hour Total	79	5	88	9	11	27	2	1005	288	292	2606	4
07:30 AM-08:30 AM	54	1	43	6	8	19	1	491	153	170	1378	1

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			1	1	
19	8	6	$\leftarrow$	1378	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	170	
	1	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	491	$\rightarrow$	54	1	43
	153	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 07:30 AM-08:30 AM

North/South Street:		Wetmore I	Rd									
East/West Street:		MacArthur View/ Airport Access / Bitters Rd										
TOD:	PM	Date:	8-May-18 Synchro Node:				Raw Data:	C:\Ethan Green	ne\28445 SA Ai	rport\TMCs\\23	-PM-Wetmore	
		Northbound	d	Southbound				Eastbound			Westbound	
	١	Netmore Ro	d	1	Wetmore Ro	b	MacArthu	r View/ Airp	ort Access		Bitters Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	13	1	32	1	3	0	2	223	23	26	176	0
4:15 PM	12	0	52	0	0	2	0	335	16	17	142	1
4:30 PM	27	1	73	0	0	1	1	272	16	20	155	3
4:45 PM	8	1	43	0	0	0	0	313	17	21	178	5
5:00 PM	47	1	63	0	0	0	0	293	13	22	205	5
5:15 PM	19	2	46	0	0	0	1	338	14	12	161	2
5:30 PM	15	1	21	1	0	3	3	324	13	9	147	1
5:45 PM	10	1	17	0	0	0	0	294	16	20	139	0
2-hour Total	151	8	347	2	3	6	7	2392	128	147	1303	17
04:30 PM-05:30 PM	101	5	225	0	0	1	2	1216	60	75	699	15

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			<b>↑</b>	15	
1	0	0	<b>←</b>	699	
←	$\downarrow$	$\rightarrow$	$\downarrow$	75	
	2	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	2 1216	$\uparrow \\ \rightarrow$	← 101	↑ 5	→ 225

Diagram for: Peak Hour
Peak Hour: 04:30 PM-05:30 PM

## All Motor Vehicles Turning Movement Counts



North/South Street:		/ FedEx-D	HL Airport	Access								
East/West Street:		Wetmore	Rd									
TOD:	AM	Date:	8-Ma	ay-18 Synchro Node: Raw Data: C:\Ethan Green					ne\28445 SA Airport\TMCs\\24-AM-Wetmore			
		Northbound	d		Southbound			Eastbound			Westbound	
				FedEx-	DHL Airport	Access		Wetmore Ro	ł	,	Wetmore Ro	d
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	2	0	1	1	157	0	0	363	2
7:15 AM	0	0	0	1	0	7	1	182	0	0	448	1
7:30 AM	0	0	0	3	0	0	3	163	0	0	473	0
7:45 AM	0	0	0	1	0	4	4	195	0	0	386	3
8:00 AM	0	0	0	0	0	3	5	158	0	0	349	3
8:15 AM	0	0	0	2	0	3	3	144	0	0	286	3
8:30 AM	0	0	0	0	0	6	8	139	0	0	244	0
8:45 AM	0	0	0	2	0	9	10	174	0	0	238	3
2-hour Total	0	0	0	11	0	33	35	1312	0	0	2787	15
07:30 AM-08:30 AM	0	0	0	6	0	10	15	660	0	0	1494	9

Pedestrians									
	NB	SB	EB	WB					
7:00 AM	0	0	0	0					
7:15 AM	0	0	0	0					
7:30 AM	0	0	0	0					
7:45 AM	0	0	0	0					
8:00 AM	0	0	0	0					
8:15 AM	0	0	0	0					
8:30 AM	0	0	0	0					
8:45 AM	0	0	0	0					

			1	9	
10	0	6	<b>←</b>	1494	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	15	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	660	$\rightarrow$	0	0	0
	0	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 07:30 AM-08:30 AM

## All Motor Vehicles Turning Movement Counts



North/South Street:		/ FedEx-D	HL Airport	Access								
East/West Street:		Wetmore I	Rd									
TOD:	PM	Date:	8-Ma	ay-18	Synchro	o Node:		Raw Data:	C:\Ethan Green	ne\28445 SA Airport\TMCs\\24-PM-Wetmore		
	1	Northbound	d	;	Southbound			Eastbound			Westbound	
				FedEx-	DHL Airport	Access		Wetmore Ro	ł	,	Wetmore Ro	d
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	0	0	0	1	0	6	4	336	0	0	186	2
4:15 PM	0	0	0	2	0	1	1	348	0	0	217	1
4:30 PM	0	0	0	1	0	3	4	328	0	0	221	4
4:45 PM	0	0	0	1	0	0	3	366	0	0	196	4
5:00 PM	0	0	0	1	0	0	2	333	0	0	266	0
5:15 PM	0	0	0	5	0	2	2	352	0	0	186	2
5:30 PM	0	0	0	1	0	2	3	352	0	0	175	1
5:45 PM	0	0	0	1	0	3	5	325	0	0	166	2
2-hour Total	0	0	0	13	0	17	24	2740	0	0	1613	16
04:30 PM-05:30 PM	0	0	0	8	0	5	11	1379	0	0	869	10

Pedestrians									
	NB	SB	EB	WB					
4:00 PM	0	0	0	0					
4:15 PM	0	0	0	0					
4:30 PM	0	0	0	0					
4:45 PM	0	0	0	0					
5:00 PM	0	0	0	0					
5:15 PM	0	0	0	0					
5:30 PM	0	0	0	0					
5:45 PM	0	0	0	0					

			<b>1</b>	10	
5	0	8	<b>←</b>	869	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	11	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	1379	$\rightarrow$	0	0	0
	0	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 04:30 PM-05:30 PM



North/South Street:		Broadway	St / Airpor	t Access								
East/West Street:		Wetmore I	Rd									
TOD:	AM	Date: 8-May-18 Synchro Node:						Raw Data:	C:\Ethan Gree	ne\28445 SA Ai	rport\TMCs\\25	-AM-Wetmore
		Northbound	k	•	Southbound	t		Eastbound			Westbound	
		Broadway S	t	Α	irport Acce	SS		Wetmore Ro	ł	,	Wetmore Ro	t
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	3	0	49	0	0	0	0	135	12	125	386	0
7:15 AM	6	0	66	0	0	0	0	147	10	165	448	0
7:30 AM	9	0	71	0	0	1	0	137	6	171	483	1
7:45 AM	5	0	86	0	0	0	0	139	12	186	411	0
8:00 AM	6	0	90	0	0	0	0	135	6	215	368	0
8:15 AM	10	0	92	0	0	0	0	104	16	164	323	0
8:30 AM	12	0	89	0	0	0	0	117	9	107	263	0
8:45 AM	15	0	97	0	0	0	0	150	18	209	271	0
2-hour Total	66	0	640	0	0	1	0	1064	89	1342	2953	1
07:30 AM-08:30 AM	30	0	339	0	0	1	0	515	40	736	1585	1

	Pedes	strians		
	NB	SB	EB	WB
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0

			$\uparrow$	1	
1	0	0	$\leftarrow$	1585	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	736	
	0	<b></b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	515	$\rightarrow$	30	0	339
	40	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 07:30 AM-08:30 AM

North/South Street:		Broadway	St / Airpor	t Access									
East/West Street:		Wetmore	Rd										
TOD:	PM	Date: 8-May-18 Synchro Node: Raw Data:							C:\Ethan Green	C:\Ethan Greene\28445 SA Airport\TMCs\\25-PM-Wetmore			
		Northbound	d	Southbound				Eastbound			Westbound		
	ı	Broadway St Airport Access		SS		Wetmore Ro	ł	,	Wetmore Ro	d			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
4:00 PM	21	0	163	0	0	0	0	232	7	92	185	0	
4:15 PM	16	0	211	1	0	2	0	354	6	78	141	0	
4:30 PM	11	0	230	1	0	0	0	357	4	65	169	0	
4:45 PM	8	0	187	0	0	1	0	355	10	77	196	1	
5:00 PM	14	0	209	0	0	0	0	316	6	70	207	0	
5:15 PM	7	0	218	1	0	0	1	401	2	58	177	0	
5:30 PM	14	0	202	0	0	0	0	357	3	61	136	0	
5:45 PM	8	0	125	0	0	0	0	318	4	62	150	0	
2-hour Total	99	0	1545	3	0	3	1	2690	42	563	1361	1	
04:30 PM-05:30 PM	40	0	844	2	0	1	1	1429	22	270	749	1	

	Pedes	trians		
	NB	SB	EB	WB
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0

			<b>1</b>	1	
1	0	2	<b>←</b>	749	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	270	
	1	$\uparrow$	$\leftarrow$	$\uparrow$	$\rightarrow$
	1 1429	$\uparrow \\ \rightarrow$	← 40	↑ 0	→ 844

Diagram for: Peak Hour
Peak Hour: 04:30 PM-05:30 PM

North/South Street:		Airport Blv	rd /									
East/West Street:		Loop 410 E	BFR /									
TOD:	AM	Date:	8-Ju	n-18	Synchro	o Node:		Raw Data:				
		Northbound	Northbound Southbound			d		Eastbound			Westbound	
		Airport Blvc	l		Airport Blvo	d	L	oop 410 EBF	R	Lo	oop 410 EBF	-R
Time	EB U-Turn	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 AM	10	5	1	37	13	0	106	7	4	10	0	0
4:15 AM	9	26	2	34	21	0	103	4	5	9	0	0
4:30 AM	9	18	5	27	22	0	102	5	8	9	0	0
4:45 AM	25	23	6	57	27	0	105	11	7	25	0	0
5:00 AM	11	27	7	36	28	0	119	11	5	11	0	0
5:15 AM	9	23	7	25	26	0	99	12	6	9	0	0
5:30 AM	27	19	7	32	37	0	97	16	9	27	0	0
5:45 AM	53	15	18	34	33	0	89	24	12	53	0	0
6:00 AM	25	31	43	27	32	0	85	18	7	25	0	0
6:15 AM	22	32	28	33	40	0	76	38	13	22	0	0
6:30 AM	27	37	46	25	50	0	80	37	21	27	0	0
6:45 AM	48	28	48	53	45	0	87	44	19	48	0	0
3-hour Total	275	284	218	420	374	0	1148	227	116	275	0	0
06:00 AM-07:00 AM	122	128	165	138	167	0	328	137	60	122	0	0

			<b>↑</b>	0	
0	167	138	$\leftarrow$	0	
←	$\downarrow$	$\rightarrow$	$\downarrow$	122	
	328	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	137	$\rightarrow$	122	128	165
	60	$\downarrow$			

Diagram for: Peak Hour

Peak Hour: 06:00 AM-07:00 AM

# All Motor Vehicles Turning Movement Counts

North/South Street:		Airport Blv	rd /									
East/West Street:		Loop 410 E	BFR /									
TOD:	PM	Date:	8-Ju	n-18	Synchro	o Node:		Raw Data:				
	1	Northbound			Southbound	d		Eastbound			Westbound	
		Airport Blvo	l		Airport Blvo	d	L	oop 410 EBF	R	Lo	oop 410 EBF	-R
Time	EB U-Turn	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
8:00 PM	27	29	20	63	46	0	81	58	6	0	0	0
8:15 PM	31	44	16	48	42	0	71	45	6	0	0	0
8:30 PM	43	44	19	52	37	0	78	67	5	0	0	0
8:45 PM	36	29	20	61	35	0	80	66	5	0	0	0
9:00 PM	22	27	15	47	38	0	61	57	6	0	0	0
9:15 PM	34	30	24	58	32	0	81	64	10	0	0	0
9:30 PM	27	24	17	49	40	0	76	48	9	0	0	0
9:45 PM	25	26	21	53	43	0	78	45	12	0	0	0
10:00 PM	27	32	14	44	33	0	91	45	2	0	0	0
10:15 PM	23	36	24	62	39	0	65	47	7	0	0	0
10:30 PM	27	32	13	47	35	0	62	55	5	0	0	0
10:45 PM	10	33	10	55	28	0	68	46	5	0	0	0
3-hour Total	332	386	213	639	448	0	892	643	78	0	0	0
08:00 PM-09:00 PM	137	146	75	224	160	0	310	236	22	0	0	0

			<b>↑</b>	0	
0	160	224	$\leftarrow$	0	
←	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	310	<b>↑</b>	$\leftarrow$	<b>↑</b>	$\rightarrow$
	236	$\rightarrow$	137	146	75
	22	$\downarrow$			

Diagram for: Peak Hour

Peak Hour: 08:00 PM-09:00 PM

North/South Street:		Airport Blv	/d /									
East/West Street:		Loop 410 \	WBFR /									
TOD:	AM	Date:	8-Jur	า-18	Synchro	o Node:		Raw Data:				
		Northboun	d		Southbound	d		Eastbound		Westbound		
		Airport Blvd Airport Blvd					Lo	oop 410 WB	FR			
Time	Left	Through	WB UTurn	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 AM	0	117	5	0	42	37	0	0	0	5	18	73
4:15 AM	4	117	5	0	46	53	0	0	0	11	16	68
4:30 AM	4	107	9	0	46	60	0	0	0	16	23	80
4:45 AM	2	140	13	0	47	43	0	0	0	19	35	71
5:00 AM	5	147	1	0	53	60	0	0	0	7	30	48
5:15 AM	5	99	12	0	51	46	0	0	0	22	38	57
5:30 AM	3	100	11	0	42	45	0	0	0	25	44	58
5:45 AM	4	65	14	0	41	31	0	0	0	33	92	63
6:00 AM	17	88	9	0	41	28	0	0	0	20	71	52
6:15 AM	9	76	9	0	44	37	0	0	0	31	113	42
6:30 AM	14	76	21	0	43	35	0	0	0	55	142	38
6:45 AM	17	101	19	0	50	39	0	0	0	47	170	56
3-hour Total	84	1233	128	0	546	514	0	0	0	291	792	706
06:00 AM-07:00 AM	57	341	58	0	178	139	0	0	0	153	496	188

			<b>↑</b>	188	
139	178	0	<b>←</b>	496	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	153	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	57	341	58
	0	$\downarrow$			

Diagram for: Peak Hour

Peak Hour: 06:00 AM-07:00 AM

North/South Street:		Airport Blv	/d /									
East/West Street:		Loop 410 \	WBFR /									
TOD:	PM	Date:	8-Jui	n-18	Synchro	o Node:		Raw Data:				
		Northboun	d	Southbound				Eastbound			Westbound	
		Airport Blv	b		Airport Blvo	d				Lo	op 410 WB	FR
Time	Left	Through	WB Uturn	Left	Through	Right	Left	Through	Right	Left	Through	Right
8:00 PM	31	89	12	0	93	80	0	0	0	33	131	54
8:15 PM	21	89	11	0	76	83	0	0	0	36	110	38
8:30 PM	23	70	10	0	75	93	0	0	0	34	116	42
8:45 PM	25	78	3	0	58	60	0	0	0	46	93	42
9:00 PM	18	54	18	0	69	55	0	0	0	43	110	36
9:15 PM	25	66	9	0	61	68	0	0	0	58	81	50
9:30 PM	21	64	6	0	80	73	0	0	0	30	82	38
9:45 PM	16	86	9	0	67	82	0	0	0	22	68	42
10:00 PM	17	65	2	0	57	40	0	0	0	26	76	34
10:15 PM	20	70	5	0	39	37	0	0	0	32	60	38
10:30 PM	17	70	10	0	45	55	0	0	0	38	79	29
10:45 PM	21	85	7	0	55	59	0	0	0	27	65	55
3-hour Total	255	886	102	0	775	785	0	0	0	425	1071	498
08:00 PM-09:00 PM	100	326	36	0	302	316	0	0	0	149	450	176

			<b>1</b>	176	
316	302	0	←	450	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	149	
	0	<b>↑</b>	←	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	100	326	36
		1			

Diagram for: Peak Hour
Peak Hour: 08:00 PM-09:00 PM

North/South Street:		Airport Blv	rd /									
East/West Street:		Northern E	Blvd /									
TOD:	AM	Date:	8-Ju	n-18	Synchro	Synchro Node: Raw Data:						
		Northbound	ł		Southbound			Eastbound		Westbound		
		Airport Blvc	l		Airport Blvo	ł	1	Northern Blv	d	١	Northern Blv	'd
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 AM	6	191	0	2	76	5	0	0	3	1	1	1
4:15 AM	4	196	0	9	91	5	3	1	3	4	0	2
4:30 AM	5	188	0	3	114	6	2	1	4	2	0	3
4:45 AM	2	203	0	6	108	4	0	0	2	2	0	3
5:00 AM	6	200	1	7	115	7	2	2	3	3	0	3
5:15 AM	5	158	2	8	95	9	1	0	0	1	0	1
5:30 AM	3	137	5	8	93	6	1	1	2	5	0	3
5:45 AM	9	139	0	5	73	7	2	1	2	4	0	3
6:00 AM	6	133	3	4	77	6	1	2	1	0	0	1
6:15 AM	3	107	7	2	79	2	1	0	2	8	1	4
6:30 AM	7	105	1	6	71	7	1	2	3	4	0	5
6:45 AM	12	129	8	4	86	8	5	0	3	5	1	1
3-hour Total	68	1886	27	64	1078	72	19	10	28	39	3	30
04:15 AM-05:15 AM	17	787	1	25	428	22	7	4	12	11	0	11

			<b>↑</b>	11	
22	428	25	$\leftarrow$	0	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	11	
	7	$\uparrow$	$\leftarrow$	<b>↑</b>	$\rightarrow$
	4	$\rightarrow$	17	787	1
	12	1			

Diagram for: Peak Hour
Peak Hour: 04:15 AM-05:15 AM



North/South Street:		Airport Blv	-										
East/West Street:		Northern E	3lvd /										
TOD:	PM	Date:	8-Ju	n-18	Synchro	Node:		Raw Data:					
		Northbound	t		Southbound			Eastbound			Westbound		
		Airport Blvd			Airport Blvd		1	Northern Blv	d	1	Northern Blv	d	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
8:00 PM	20	121	5	7	174	14	26	2	2	5	0	6	
8:15 PM	27	92	5	9	153	20	29	1	2	5	1	4	
8:30 PM	19	89	6	14	160	18	33	0	0	8	2	9	
8:45 PM	35	73	10	16	113	20	13	2	3	0	2	3	
9:00 PM	15	78	3	11	124	13	28	3	3	3	4	7	
9:15 PM	10	98	6	12	133	8	23	1	4	6	2	6	
9:30 PM	10	95	6	4	146	15	20	1	0	4	1	6	
9:45 PM	29	89	8	5	154	11	16	1	2	4	2	3	
10:00 PM	18	64	7	13	97	9	5	4	2	4	5	2	
10:15 PM	15	86	4	6	66	16	15	3	1	9	2	3	
10:30 PM	20	62	4	7	100	15	29	3	0	3	3	5	
10:45 PM	37	99	6	5	114	20	23	0	0	5	3	7	
3-hour Total	255	1046	70	109	1534	179	260	21	19	56	27	61	
08:00 PM-09:00 PM	101	375	26	46	600	72	101	5	7	18	5	22	

			<b>1</b>	22	
72	600	46	←	5	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	18	
	101	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	5	$\rightarrow$	101	375	26
	7	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 08:00 PM-09:00 PM

North/South Street:		Airport Blv	d/Termina	l Dr								
East/West Street:		Dee Howa	rd Way /									
TOD:	AM	Date:	8-Ju	n-18	Synchro	o Node:	Raw Data:					
		Northbound	d		Southbound			Eastbound		Westbound		
		Airport Blvo	ł		Terminal D	•	De	ee Howard W	/ay			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 AM	36	0	148	20	81	45	0	44	10	0	0	0
4:15 AM	31	0	149	24	106	60	0	64	4	0	0	0
4:30 AM	17	0	169	21	130	71	0	91	2	0	0	0
4:45 AM	23	0	185	11	111	83	0	67	5	0	0	0
5:00 AM	14	0	169	19	139	55	0	56	6	0	0	0
5:15 AM	22	0	121	23	102	57	0	50	6	0	0	0
5:30 AM	15	0	129	17	94	47	0	61	7	0	0	0
5:45 AM	29	3	94	17	71	43	0	45	12	0	0	0
6:00 AM	22	4	108	22	85	54	0	45	16	0	0	0
6:15 AM	15	3	95	18	69	36	0	46	8	0	0	0
6:30 AM	23	1	78	14	78	38	0	38	18	0	0	0
6:45 AM	18	0	126	17	88	54	0	55	23	0	0	0
3-hour Total	265	11	1571	223	1154	643	0	662	117	0	0	0
04:15 AM-05:15 AM	85	0	672	75	486	269	0	278	17	0	0	0

			<b>↑</b>	0	
269	486	75	<b>←</b>	0	
←	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	<b>↑</b>	<b>←</b>	1	$\rightarrow$
	0 278	$\uparrow \\ \rightarrow$	← 85	↑ 0	→ 672

Diagram for: Peak Hour
Peak Hour: 04:15 AM-05:15 AM

North/South Street:		Airport Blv	d/Termina	l Dr								
East/West Street:		Dee Howa	rd Way /									
TOD:	PM	Date:	8-Ju	n-18	Synchro	o Node:		Raw Data:				
		Northbound	k		Southbound			Eastbound			Westbound	
		Airport Blvo	l		Terminal Dr		De	e Howard W	/ay			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
8:00 PM	15	0	156	57	164	112	0	42	26	0	0	0
8:15 PM	3	1	124	59	169	75	0	43	18	0	0	0
8:30 PM	9	0	125	47	174	139	0	48	20	0	0	0
8:45 PM	7	0	89	39	116	64	0	44	25	0	0	0
9:00 PM	7	1	106	32	135	93	0	26	25	0	0	0
9:15 PM	7	0	138	38	135	70	0	36	15	0	0	0
9:30 PM	14	1	106	45	161	89	0	39	15	0	0	0
9:45 PM	15	1	103	20	141	79	0	34	19	0	0	0
10:00 PM	5	1	67	15	93	40	0	27	24	0	0	0
10:15 PM	5	0	98	30	81	31	0	28	20	0	0	0
10:30 PM	2	0	99	56	101	93	0	35	16	0	0	0
10:45 PM	4	0	131	37	128	87	0	49	20	0	0	0
3-hour Total	93	5	1342	475	1598	972	0	451	243	0	0	0
08:00 PM-09:00 PM	34	1	494	202	623	390	0	177	89	0	0	0

			<b>↑</b>	0	
390	623	202	$\leftarrow$	0	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	<b>↑</b>	<b>←</b>	1	$\rightarrow$
	177	$\rightarrow$	34	1	494
	89	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 08:00 PM-09:00 PM

North/South Street:		Airport Ga	te #20/Ter	minal Dr								
East/West Street:		Service Rd										
TOD:	AM	Date:	8-Ju	n-18	Synchro	o Node:	Raw Data:					
		Northbound	d	Southbound				Eastbound		Westbound		
	Ai	rport Gate #	‡20		Terminal D	٢		Service Rd			Service Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 AM	0	0	0	0	1	0	0	0	1	0	0	0
4:15 AM	1	0	0	0	0	0	1	0	0	0	0	0
4:30 AM	0	1	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	1	0	1	3	0	1	0	0	0	0
5:45 AM	0	1	0	1	0	0	0	0	0	1	1	0
6:00 AM	1	0	0	0	0	0	0	1	0	1	0	0
6:15 AM	0	0	0	1	0	1	0	1	0	0	3	0
6:30 AM	1	1	0	1	0	0	0	0	3	1	0	0
6:45 AM	0	0	0	1	0	0	0	2	0	0	0	1
3-hour Total	3	3	1	4	2	4	1	5	4	3	4	1
05:45 AM-06:45 AM	2	2	0	3	0	1	0	2	3	3	4	0

			<b>1</b>	0	
1	0	3	←	4	
←	$\downarrow$	$\rightarrow$	$\downarrow$	3	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	2	$\rightarrow$	2	2	0
	_	1			

Diagram for: Peak Hour

Peak Hour: 05:45 AM-06:45 AM

## All Motor Vehicles Turning Movement Counts



North/South Street: East/West Street:		Airport Gar Service Rd	te #20/Ter	minal Dr								
TOD:	PM	Date:	8-Ju	n-18	Synchro	Node:		Raw Data:				
		Northbound	d		Southbound		Eastbound			Westbound		
	Aiı	rport Gate #	20	Terminal Dr			Service Rd				Service Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
8:00 PM	0	0	0	0	0	0	0	0	1	0	0	0
8:15 PM	0	0	0	0	0	1	1	1	0	0	1	0
8:30 PM	0	0	0	0	1	0	0	0	0	0	0	1
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	1	0	0	0	0	1	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	1	1	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	1	1	0	1	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	1	0	1	0	0	0
3-hour Tota	1	2	0	0	1	2	4	1	3	0	1	1
08:00 PM-09:00 PM	0	0	0	0	1	1	1	1	1	0	1	1

			<b>↑</b>	1	
1	1	0	←	1	
←	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	1	<b>1</b>	$\leftarrow$	<b>1</b>	$\rightarrow$
			-		· · · · · · · · · · · · · · · · · · ·
	1	$\rightarrow$	0	0	0

Diagram for: Peak Hour
Peak Hour: 08:00 PM-09:00 PM

		Northbound	ł		Southbound	ł		Eastbound			Westbound	
	Jo	ohn Saunde	rs	Jo	ohn Saunde	rs	De	e Howard W	/ay	Dee Howard Way		
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 AM	0	0	4	3	0	2	4	63	0	2	33	5
4:15 AM	0	0	2	0	0	1	7	88	1	1	59	7
4:30 AM	0	0	2	0	0	1	4	85	0	3	63	4
4:45 AM	1	0	3	2	0	0	17	85	1	2	84	12
5:00 AM	0	0	4	2	0	5	10	58	0	2	51	5
5:15 AM	0	0	3	0	0	1	11	63	0	2	52	12
5:30 AM	1	0	3	0	0	1	24	66	4	3	50	13
5:45 AM	1	0	3	2	0	5	38	60	6	3	41	17
6:00 AM	0	0	2	1	0	7	16	55	0	2	51	7
6:15 AM	0	0	2	0	0	0	11	62	1	2	40	2
6:30 AM	1	0	5	0	0	2	11	66	1	6	40	3
6:45 AM	1	0	2	0	0	2	11	86	3	2	54	3
3-hour Total	5	0	35	10	0	27	164	837	17	30	618	90
04:15 AM-05:15 AM	1	0	11	4	0	7	38	316	2	8	257	28

			<b>↑</b>	28	
7	0	4	$\leftarrow$	257	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	8	
	38	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	316	$\rightarrow$	1	0	11
	2	$\downarrow$			

Diagram for: Peak Hour

Peak Hour: 04:15 AM-05:15 AM

North/South Street:		John Saun	ders									
East/West Street:		Dee Howa	rd Way									
TOD:	PM	Date:	8-Ju	n-18 Synchro Node: Raw Data:								
		Northbound	d	Southbound			Eastbound			Westbound		
	J	ohn Saunde	rs	John Saunders		De	ee Howard W	/ay	De	e Howard V	Vay	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
8:00 PM	4	0	8	2	0	8	0	55	1	3	115	3
8:15 PM	2	0	2	1	0	2	3	58	1	1	65	1
8:30 PM	2	0	5	0	0	4	1	66	1	2	137	3
8:45 PM	1	0	3	0	0	1	1	71	1	2	71	0
9:00 PM	1	0	3	0	0	0	1	39	1	5	89	0
9:15 PM	4	0	2	0	0	1	1	49	0	1	74	1
9:30 PM	2	0	3	0	0	2	3	53	0	2	88	0
9:45 PM	4	0	4	2	0	5	2	41	2	6	76	3
10:00 PM	6	0	5	2	0	7	3	44	0	3	38	1
10:15 PM	1	0	3	0	0	1	0	47	0	1	36	1
10:30 PM	1	0	1	0	0	4	0	61	2	2	94	1
10:45 PM	4	0	6	0	0	3	3	67	0	4	85	1
3-hour Total	32	0	45	7	0	38	18	651	9	32	968	15
08:00 PM-09:00 PM	9	0	18	3	0	15	5	250	4	8	388	7

			<b>1</b>	7	
15	0	3	←	388	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	8	
	5	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	250	$\rightarrow$	9	0	18
	4	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 08:00 PM-09:00 PM

North/South Street:		US 281 NBI	FR /									
East/West Street:		/ Dee How	ard Way									
TOD:	AM	Date:	te: 8-Jun-18			Synchro Node:		Raw Data:				
		Northbound	l		Southbound	t	Eastbound			Westbound		
		US 281 NBFF	₹								e Howard V	Vay
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 AM	0	15	10	0	0	0	0	0	0	0	0	29
4:15 AM	0	18	8	0	0	0	0	0	0	0	0	24
4:30 AM	0	34	5	0	0	0	0	0	0	0	0	41
4:45 AM	0	43	20	0	0	0	0	0	0	0	0	34
5:00 AM	0	30	10	0	0	0	0	0	0	0	0	37
5:15 AM	0	36	9	0	0	0	0	0	0	0	0	30
5:30 AM	0	46	11	0	0	0	0	0	0	0	0	25
5:45 AM	0	117	39	0	0	0	0	0	0	0	0	34
6:00 AM	0	77	24	0	0	0	0	0	0	0	0	31
6:15 AM	0	73	11	0	0	0	0	0	0	0	0	25
6:30 AM	0	89	12	0	0	0	0	0	0	0	0	23
6:45 AM	0	156	11	0	0	0	0	0	0	0	0	39
3-hour Total	0	734	170	0	0	0	0	0	0	0	0	372
06:00 AM-07:00 AM	0	395	58	0	0	0	0	0	0	0	0	118

			<b>↑</b>	118	
0	0	0	$\leftarrow$	0	
←	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	0 0	$\uparrow \\ \rightarrow$	← 0	↑ 395	→ 58

Diagram for: Peak Hour

Peak Hour: 06:00 AM-07:00 AM

North/South Street	:	US 281 NB	FR /									
East/West Street:		/ Dee How	vard Way									
TOD:	PM	Date:	Date: 8-Jun-18			Synchro Node: Raw Data:						
		Northbound	k		Southbound	d	Eastbound			Westbound		
		US 281 NBF	R								e Howard V	Vay
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
8:00 PN	0	77	13	0	0	0	0	0	0	0	0	83
8:15 PN	1 0	69	20	0	0	0	0	0	0	0	0	55
8:30 PN	0	78	28	0	0	0	0	0	0	0	0	89
8:45 PN	1 0	69	16	0	0	0	0	0	0	0	0	54
9:00 PN	0	67	11	0	0	0	0	0	0	0	0	61
9:15 PN	1 0	77	13	0	0	0	0	0	0	0	0	44
9:30 PN	0	61	18	0	0	0	0	0	0	0	0	60
9:45 PN	1 0	57	17	0	0	0	0	0	0	0	0	63
10:00 PN	0	62	8	0	0	0	0	0	0	0	0	29
10:15 PN	1 0	53	10	0	0	0	0	0	0	0	0	27
10:30 PN	0	43	21	0	0	0	0	0	0	0	0	42
10:45 PN	1 0	46	19	0	0	0	0	0	0	0	0	70
3-hour Tota	0	759	194	0	0	0	0	0	0	0	0	677
08:00 PM-09:00 PM	0	293	77	0	0	0	0	0	0	0	0	281

			<b>↑</b>	281	
0	0	0	$\leftarrow$	0	
←	$\downarrow$	$\rightarrow$	$\downarrow$	0	
	0	<b>↑</b>	<b>←</b>	1	$\rightarrow$
	0	$\uparrow \\ \rightarrow$	<b>←</b> 0	↑ 293	→ 77

Diagram for: Peak Hour

Peak Hour: 08:00 PM-09:00 PM

North/South Street:		/ US 281 S	BFR									
East/West Street:		/ Dee How	vard Way									
TOD:	AM	Date:	8-Ju	n-18	Synchro	o Node:		Raw Data:				
		Northbound	d	Southbound			Eastbound			Westbound		
				US 281 SBRF						De	e Howard V	Vay
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 AM	0	0	0	49	6	0	0	0	0	15	0	0
4:15 AM	0	0	0	78	6	0	0	0	0	23	0	0
4:30 AM	0	0	0	92	9	0	0	0	0	26	0	0
4:45 AM	0	0	0	78	12	0	0	0	0	40	0	0
5:00 AM	0	0	0	68	18	0	0	0	0	34	0	0
5:15 AM	0	0	0	63	9	0	0	0	0	19	0	0
5:30 AM	0	0	0	71	13	0	0	0	0	23	0	0
5:45 AM	0	0	0	64	22	0	0	0	0	18	0	0
6:00 AM	0	0	0	68	23	0	0	0	0	25	0	0
6:15 AM	0	0	0	56	29	0	0	0	0	19	0	0
6:30 AM	0	0	0	60	43	0	0	0	0	18	0	0
6:45 AM	0	0	0	87	46	0	0	0	0	18	0	0
3-hour Total	0	0	0	834	236	0	0	0	0	278	0	0
06:00 AM-07:00 AM	0	0	0	271	141	0	0	0	0	80	0	0

			<b>↑</b>	0	
0	141	271	<b>←</b>	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	80	
	0	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\rightarrow$	0	0	0
	0	$\downarrow$			

Diagram for: Peak Hour

Peak Hour: 06:00 AM-07:00 AM

North/South Street:		/ US 281 S	BFR									
East/West Street:		/ Dee How	vard Way									
TOD:	PM	Date:	8-Ju	n-18	Synchro	o Node:		Raw Data:				
		Northbound	d		Southbound			Eastbound		Westbound		
				US 281 SBRF					De	e Howard V	<b>V</b> ay	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
8:00 PM	0	0	0	48	51	0	0	0	0	47	0	0
8:15 PM	0	0	0	39	59	0	0	0	0	39	0	0
8:30 PM	0	0	0	40	55	0	0	0	0	37	0	0
8:45 PM	0	0	0	52	42	0	0	0	0	27	0	0
9:00 PM	0	0	0	40	51	0	0	0	0	38	0	0
9:15 PM	0	0	0	35	39	0	0	0	0	23	0	0
9:30 PM	0	0	0	38	41	0	0	0	0	35	0	0
9:45 PM	0	0	0	35	40	0	0	0	0	30	0	0
10:00 PM	0	0	0	41	34	0	0	0	0	27	0	0
10:15 PM	0	0	0	35	27	0	0	0	0	16	0	0
10:30 PM	0	0	0	30	22	0	0	0	0	31	0	0
10:45 PM	0	0	0	44	20	0	0	0	0	37	0	0
3-hour Tota	0	0	0	477	481	0	0	0	0	387	0	0
08:00 PM-09:00 PM	0	0	0	179	207	0	0	0	0	150	0	0

			<b>↑</b>	0	
0	207	179	$\leftarrow$	0	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	150	
	0	<b>↑</b>	<b>←</b>	<b>↑</b>	$\rightarrow$
	0	$\uparrow \\ \rightarrow$	← 0	↑ 0	→ 0

Diagram for: Peak Hour
Peak Hour: 08:00 PM-09:00 PM

# All Motor Vehicles Turning Movement Counts



North/South Street:		Isom Rd										
East/West Street:		Ramsey Ro	l									
TOD:	AM	Date: 12-Jun-18 Synchro Node:						Raw Data: E:\Working Folder\14. 28445A SA Airport\Traffic Counts\N				
	ı	Northbound	ł		Southbound			Eastbound		Westbound		
		Isom Rd		Isom Rd Ramsey Rd					Ramsey Rd			
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	16	33	25	6	26	8	2	13	11	8	11	2
7:15 AM	16	43	23	6	29	7	2	8	6	7	7	5
7:30 AM	14	49	20	3	35	2	2	19	5	5	12	3
7:45 AM	15	64	26	8	42	6	4	24	10	10	13	5
8:00 AM	8	71	41	8	49	11	3	18	13	15	11	8
8:15 AM	12	57	25	11	37	7	6	19	7	14	20	7
8:30 AM	12	61	27	9	39	13	2	20	8	18	18	6
8:45 AM	11	47	23	6	40	7	4	17	4	17	8	0
2-hour Total	104	425	210	57	297	61	25	138	64	94	100	36
07:45 AM-08:45 AM	47	253	119	36	167	37	15	81	38	57	62	26

	Pedes	trians		
	NB	SB	EB	WB
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0

			1	26	
37	167	36	<b>←</b>	62	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	57	
	15	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	81	$\rightarrow$	47	253	119
	38	$\downarrow$			

Diagram for: Peak Hour
Peak Hour: 07:45 AM-08:45 AM

North/South Street:		Isom Rd										
East/West Street:		Ramsey Ro	l									
TOD:	PM	Date:	Date: 12-Jun-18 Synchro Node:					Raw Data: E:\Working Folder\14. 28445A SA Airport\Traffic Counts\N				
		Northbound	d	Southbound			Eastbound		Westbound			
		Isom Rd	Isom Rd Ison					Ramsey Rd			Ramsey Rd	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	15	73	25	9	56	3	13	18	10	14	21	17
4:15 PM	16	57	23	7	64	3	7	19	8	26	32	10
4:30 PM	16	56	17	2	57	1	7	16	9	21	41	15
4:45 PM	18	56	19	8	75	6	3	14	10	25	44	9
5:00 PM	14	65	22	6	90	10	7	15	5	24	44	22
5:15 PM	20	66	18	7	92	13	6	20	9	47	46	12
5:30 PM	17	51	21	7	66	16	2	22	14	23	64	12
5:45 PM	16	57	13	6	54	5	9	12	9	23	56	11
2-hour Total	132	481	158	52	554	57	54	136	74	203	348	108
04:45 PM-05:45 PM	69	238	80	28	323	45	18	71	38	119	198	55

	Pedes	strians									
	NB SB EB WB										
4:00 PM	0	0	0	0							
4:15 PM	0	0	0	0							
4:30 PM	0	0	0	0							
4:45 PM	0	0	0	0							
5:00 PM	0	0	0	0							
5:15 PM	0	0	0	0							
5:30 PM	0	0	0	0							
5:45 PM	0	0	0	0							

			<b>1</b>	55	
45	323	28	<b>←</b>	198	
<b>←</b>	$\downarrow$	$\rightarrow$	$\downarrow$	119	
	10	<b>1</b>		<b>1</b>	
	18		$\leftarrow$		$\rightarrow$
	71	$\rightarrow$	69	238	→ 80

Diagram for: Peak Hour
Peak Hour: 04:45 PM-05:45 PM



North/South Street:		Isom Rd										
East/West Street:		Jones Malt	sberger									
TOD:	AM	Date:	Date: 12-Jun-18 Synchro Node:					Raw Data: E:\Working Folder\14. 28445A SA Airport\Traffic Counts\NE				
		Northbound	k	Southbound			Eastbound		Westbound			
		Isom Rd			Isom Rd		Jor	nes Maltsber	ger	Jon	es Maltsbei	rger
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	5	0	9	0	0	0	0	35	5	3	47	1
7:15 AM	4	0	20	0	0	0	0	39	6	2	32	0
7:30 AM	2	0	20	0	0	0	1	44	8	5	48	1
7:45 AM	8	2	25	0	0	0	2	63	6	6	64	4
8:00 AM	8	0	20	0	0	0	1	60	12	6	62	0
8:15 AM	11	0	21	0	0	0	0	44	8	6	55	1
8:30 AM	12	0	19	0	0	0	0	44	8	8	53	0
8:45 AM	9	0	18	0	0	0	0	35	7	3	72	0
2-hour Total	59	2	152	0	0	0	4	364	60	39	433	7
07:45 AM-08:45 AM	39	2	85	0	0	0	3	211	34	26	234	5

	Pedes	trians								
NB SB EB WB										
7:00 AM	0	0	0	0						
7:15 AM	0	0	0	0						
7:30 AM	0	0	0	0						
7:45 AM	0	0	0	0						
8:00 AM	0	0	0	0						
8:15 AM	0	0	0	0						
8:30 AM	0	0	0	0						
8:45 AM	0	0	0	0						

			<b>↑</b>	5	
0	0	0	$\leftarrow$	234	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	26	
	3	<b>↑</b>	$\leftarrow$	1	$\rightarrow$
	3 211	$\uparrow \\ \rightarrow$	← 39	↑ 2	→ 85

Diagram for: Peak Hour
Peak Hour: 07:45 AM-08:45 AM

North/South Street:		Isom Rd										
East/West Street:		Jones Malt	sberger									
TOD:	PM	Date: 12-Jun-18 Synchro Node:						Raw Data: E:\Working Folder\14. 28445A SA Airport\Traffic Counts\N				
		Northbound			Southbound	t		Eastbound		Westbound		
		Isom Rd	Rd Isom Rd			Jor	nes Maltsber	ger	Jon	es Maltsber	ger	
Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:00 PM	5	0	13	1	0	1	1	41	12	9	75	0
4:15 PM	15	0	11	0	0	0	1	48	9	15	81	0
4:30 PM	10	0	5	1	1	2	0	41	13	9	98	0
4:45 PM	4	0	10	0	1	1	0	33	6	19	81	0
5:00 PM	13	0	17	0	0	3	0	42	10	17	119	0
5:15 PM	9	0	17	0	0	2	0	37	7	19	136	0
5:30 PM	11	0	7	0	0	0	0	30	7	13	121	0
5:45 PM	8	0	8	0	0	0	0	23	3	15	109	0
2-hour Total	75	0	88	2	2	9	2	295	67	116	820	0
05:00 PM-06:00 PM	41	0	49	0	0	5	0	132	27	64	485	0

Pedestrians								
	NB	SB	EB	WB				
4:00 PM	0	0	0	0				
4:15 PM	0	0	0	0				
4:30 PM	0	0	0	0				
4:45 PM	0	0	0	0				
5:00 PM	0	0	0	0				
5:15 PM	0	0	0	0				
5:30 PM	0	0	0	0				
5:45 PM	0	0	0	0				

			1	0	
5	0	0	<b>←</b>	485	
$\leftarrow$	$\downarrow$	$\rightarrow$	$\downarrow$	64	
	0	$\uparrow$	<b>←</b>	<b>↑</b>	$\rightarrow$
	132	$\rightarrow$	41	0	49
	27	$\downarrow$			

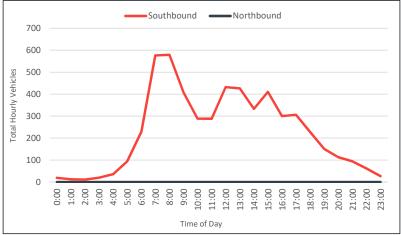
Diagram for: Peak Hour
Peak Hour: 05:00 PM-06:00 PM



Data Date: 08-May-18 Weekday: Tue

Corridor: San Antonio Airport Master Plan

Count Location: US 281 SB Ramp, Isom Road SB Exit



		AM				PM				
Time	Direction	Direction Hourly Totals								
	Southbound Northbound	Southbound	Hourly Totals Northbound		Southbound	Northbound			Both Directions	
12:00	8				100					
12:15	3	19		40	94		400		400	
12:30	4		0	19	126		432	0	432	
12:45	4				112					
01:00	3				114					
01:15	3	40	0	13	107		426		426	
01:30	5	13			105			0		
01:45	2				100					
02:00	6				97					
02:15	4				84					
02:30	0	11	0	11	66		333	0	333	
02:45	1				86					
03:00	3				111					
03:15	6	00	_		101		440	_	4.0	
03:30	5	20	0	20	93		410	0	410	
03:45	6				105					
04:00	6				69					
04:15	9	00	_	0.0	81		000	_	300	
04:30	4	36	0	36	73		300	0		
04:45	17				77					
05:00	24		0	94	84			0	306	
05:15	19				96					
05:30	19	94			65		306			
05:45	32				61					
06:00	33		0	228	59		227	0	227	
06:15	46				70					
06:30	64	228			50					
06:45	85				48					
07:00	136				44		150	0		
07:15	149	570	0	576	30				150	
07:30	155	576			31					
07:45	136				45					
08:00	187				31					
08:15	128	F70	0	579	24		113	0	113	
08:30	126	579			28					
08:45	138				30					
09:00	111				24				94	
09:15	111	400	_	400	25		0.4	0		
09:30	97	408	0	408	29		94			
09:45	89				16					
10:00	69		0	289	14		62	0	62	
10:15	67	289			21					
10:30	76				11					
10:45	77				16					
11:00	72				11					
11:15	61	288	0	288	8		27	0	27	
11:30	82				5			"	21	
11:45	73				3					
Total		2,561	0	2,561			2,880	0	2,880	
Daily Total		5,441	0	5,441						

#### **Field Data Collection** 24 Hour Tube Counts

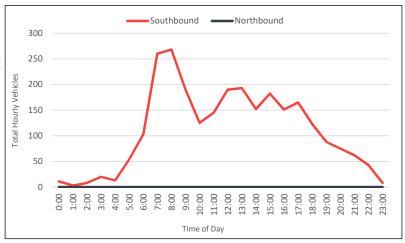


Data Date: 08-May-18 Weekday: Tue

Corridor: San Antonio Airport Master Plan

US 281 SB Ramp, Count Location:

Jones Maltsberger Rd SB Exit



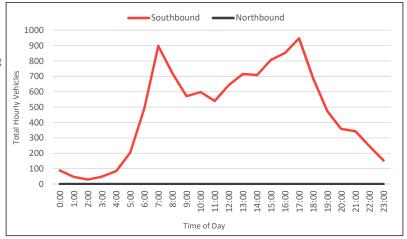
	AM				PM						
Time	Dire	Direction Hourly Totals					Direction Hourly Totals				
	Southbound		Southbound		Both Directions					Both Directions	
12:00	2		o o a a i i o a i i a	Horansoana	2011 211 00110110	49	1101111204114	o o a a i i o a i i a	. voi and dania	Bour Biroouorio	
12:15	2			0		30				190	
12:30	4		11		11	62		190	0		
12:45	3					49					
01:00	1					56					
01:15	0			0	3	45		193	0	193	
01:30	1		3			48					
01:45	1					44					
02:00	6					41					
02:15	2					32					
02:30	0		8	0	8	34		152	0	152	
02:45	0					45					
03:00	2					42					
03:15	3					46				182	
03:30	9		20	0	20	46		182	0		
03:45	6					48					
03.45	1					40					
04:00	4			0		41				151	
04:13	1		13		13	29		151	0		
04:30	7					40					
05:00	12					40			<del> </del>		
	12			0	54	50		165	0	165	
05:15			54								
05:30	15					42					
05:45	15					33					
06:00	18				103	40		123	0	123	
06:15	25		103	0		29					
06:30	26					26					
06:45	34					28					
07:00	54					28		88	0	88	
07:15	70		260	0	260	14					
07:30	76					24					
07:45	60			1		22			<u> </u>		
08:00	91				268	21					
08:15	51		268	0		16		75	0	75	
08:30	66					15					
08:45	60					23					
09:00	56					14			0	62	
09:15	54		190	0	190	13		62			
09:30	40			-		23					
09:45	40					12					
10:00	30					8		43	0	43	
10:15	26		125	0	125	11					
10:30	36			-		13					
10:45	33					11					
11:00	33				145	5		8	0	8	
11:15	31		145	0		1					
11:30	44					2					
11:45	37					0					
Total			1,200	0	1,200			1,432	0	1,432	
Daily Total			2,632	0	2,632						

Data Date: 08-May-18 Weekday: Tue

Corridor: San Antonio Airport Master Plan

US 281 SB Ramp, Count Location: Airport Blvd SB

. Entrance

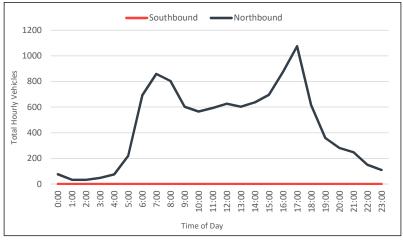


			AM					PM		
Time	Dire	ction		Hourly Totals		Dire	ction		Hourly Totals	
	Southbound	Northbound	Southbound	Northbound		Southbound	Northbound	Southbound	Northbound	Both Directions
12:00	30	Horanboana	Couribouria	Horanbound	Both Birodione	159	Horarboaria	Couribouria	rtortribouria	Both Birodione
12:15	23					155				
12:30	17		88	0	88	173		642	0	642
12:45	18					155				
01:00	17					164				
01:15	13					178				
01:30	10		46	0	FALSE	205		716	0	716
01:45	6					169				
02:00	7					165				
02:00	7									
			29	0	29	182		708	0	708
02:30	9					185				
02:45	6					176				
03:00	8					165				
03:15	6		49	0	49	181		807	0	807
03:30	17					253				
03:45	18					208				
04:00	10					178				
04:15	21		84	0	84	228		852	0	852
04:30	29					221				
04:45	24					225				
05:00	50					255				
05:15	45		204	0	204	267		947	0	947
05:30	53		204	0	204	224		347	U	347
05:45	56					201				
06:00	77					169				
06:15	99		400	0	400	203		000	0	000
06:30	156		490	0	490	171		686	0	686
06:45	158					143				
07:00	186					118				
07:15	248		000			125				
07:30	239		898	0	898	117		474	0	474
07:45	225					114				
08:00	216					104				
08:15	169					89				
08:30	155		720	0	720	81		358	0	358
08:45	180					84				
09:00	157					85				
09:15	137					101				
09:30	121		571	0	571	76		343	0	343
09:45	156					81				
10:00	155					67				
10:15	158					52				
10:30	143		598	0	598	58		246	0	246
10:35	143					69				
11:00	134					35				
11:00	120					35 35				
	145		540	0	540			153	0	153
11:30						53				
11:45	141		4 247		4 074	30		6 000		6 000
Total			4,317	0	4,271			6,932	0	6,932
Daily Total			11,249	0	11,249					

Data Date: 08-May-18 Weekday: Tue

Corridor: San Antonio Airport Master Plan

US 281 NB Ramp, Nakoma Dr NB Exit Count Location:



		AM					PM		
Time	Direction		Hourly Totals		Dire	ction		Hourly Totals	i
	Southbound Northbound			Both Directions	Southbound	Northbound	Southbound		Both Directions
12:00	30					147			
12:15	21		70	70		159		000	000
12:30	14	0	76	76		174	0	626	626
12:45	11					146			
01:00	6					147			
01:15	7		00	00		153		000	000
01:30	7	0	33	33		133	0	603	603
01:45	13					170			
02:00	8					147			
02:15	3		00			172		007	
02:30	10	0	33	33		170	0	637	637
02:45	12					148			
03:00	14					172			
03:15	7		40	40		161			
03:30	9	0	48	48		176	0	696	696
03:45	18					187			
04:00	7					180			
04:15	16		7.5	7.5		228		075	075
04:30	13	0	75	75		236	0	875	875
04:45	39					231			
05:00	27					244			
05:15	31		000			262		4.075	4.075
05:30	60	0	220	220		273	0	1,075	1,075
05:45	102					296			
06:00	102					208			
06:15	170		200			144		0.4.4	
06:30	187	0	693	693		138	0	614	614
06:45	234					124			
07:00	192					90			
07:15	206	0	050	050		102	0	200	200
07:30	215	0	859	859		84	"	360	360
07:45	246					84			
08:00	206					74			
08:15	215	0	804	804		67	0	282	282
08:30	182	0	004	004		61	"	202	202
08:45	201					80			
09:00	170					63			
09:15	128	0	603	603		72	0	248	248
09:30	143	U	000	003		45	"	240	240
09:45	162					68			
10:00	131					50			
10:15	134	0	566	566		37	0	150	150
10:30	157		550	550		36	l ĭ	100	
10:45	144					27			
11:00	135					36			
11:15	132	0	593	593		23	0	110	110
11:30	157		555	555		24	l ĭ	. 10	'''
11:45	169					27			
Total		0	4,603	4,603			0	6,276	6,276
Daily Total		0	10,879	10,879					

Data Date: 08-May-18 Weekday: Tue

Corridor: San Antonio Airport
Master Plan

Count Location: Loop 410 EB,
Wetmore Rd Ex

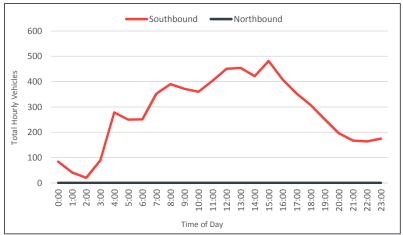
Wetmore Rd Exit Ramp



			AM					PM		
Time	Dire	ction		Hourly Totals		Dire	ection		Hourly Totals	1
	Eastbound	Westbound	Eastbound	Westbound	Both Directions	Eastbound	Westbound	Eastbound	Westbound	Both Directions
12:00	28					285				
12:15	24		88	0	88	278		1,118	0	1,118
12:30	22		00		00	285		1,110	ľ	1,110
12:45	14					270				
01:00	18					277				
01:15	23		75	0	75	257		1,096	0	1,096
01:30	11		70	Ĭ	, ,	301		1,000		1,000
01:45	23					261				
02:00	22					247				
02:15	19		76	0	76	283		1.053	0	1,053
02:30	15		7.0	Ĭ	, ,	260		1,000		1,000
02:45	20					263				
03:00	10					264				
03:15	22		82	0	82	320		1,291	0	1,291
03:30	29		02	Ĭ	02	306		1,201		1,201
03:45	21					401				
04:00	14					390				
04:15	16		115	0	115	456		1,654	0	1,654
04:30	39		110	Ĭ	110	422		1,004		1,001
04:45	46					386				
05:00	28					425				
05:15	78		357	0	357	402		1,645	0	1,645
05:30	93		007	Ĭ	007	399		1,040		1,040
05:45	158					419				
06:00	133					395				
06:15	190		894	0	894	367		1,401	0	1,401
06:30	235		001	Ĭ	001	327		1,101		1,401
06:45	336					312				
07:00	314					255				
07:15	335		1,344	0	1,344	206		830	0	830
07:30	321		.,0		.,	187		000		
07:45	374					182				
08:00	400					172				
08:15	327		1,407	0	1,407	137		616	0	616
08:30	333		.,		.,	168				
08:45	347					139				
09:00	296					155				
09:15	225		1,008	0	1,008	118		503	0	503
09:30	214		.,,,,,,		1,,,,,,,	127				
09:45	273					103				
10:00	236					84				
10:15	221		930	0	930	67		278	0	278
10:30	214					67				
10:45	259					60				
11:00	232					53				
11:15	274		1,070	0	1,070	61		179	0	179
11:30	276		.,	_	-,	34		***	_	
11:45	288					31				
Total			7,446	0	7,446			11,664	0	11,664
Daily Total			19,110	0	19,110					

Corridor: San Antonio Airport
Master Plan
Count Location: US 281 SB Ramp,

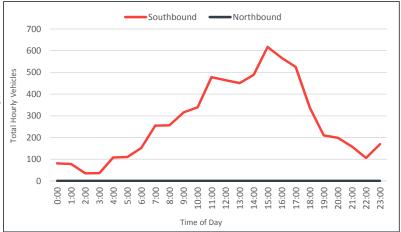
US 281 SB Ramp, Airport SB Exit, South of Dee Howard Way



		AM					PM		
Time	Direction		Hourly Totals		Dire	ction		Hourly Totals	1
	Southbound Northbound	Southbound	Northbound	Both Directions	Southbound	Northbound	Southbound	Northbound	Both Directions
12:00	29				98				
12:15	25	0.4	0	84	113		451	0	454
12:30	13	84	U	84	122		451	U	451
12:45	17				118				
01:00	16				102				
01:15	8		_		115			_	
01:30	8	41	0	41	127		454	0	454
01:45	9				110				
02:00	7				102				
02:15	2		_		115			_	
02:30	3	20	0	20	107		421	0	421
02:45	8				97				
03:00	15				105				
03:15	16				121				
03:30	21	89	0	89	126		481	0	481
03:45	37				129				
04:00	50				117				
04:15	81				88				
04:30	72	278	0	278	104		408	0	408
04:45	75				99				
05:00	63				75				
05:15	58				80				
05:30	67	250	0	250	86		352	0	352
05:45	62				111				
06:00	46				85				
06:00	57				73				
06:30	63	251	0	251	80		307	0	307
06:45	85				69				
07:00	80				59				
07:00	81				73				
07:15	91	352	0	352	66		251	0	251
07:30	100				53				
08:00	110				47				
08:15 08:30	110 81	390	0	390	46 51		196	0	196
08:30	89				52				
09:00	90				46				
09:00	85				46				
09:15	91	371	0	371	38		167	0	167
09:30	105				38				
10:00	84				40				
	93				-				
10:15		360	0	360	33		164	0	164
10:30	81				43				
10:45	102 95				48 47				
11:00									
11:15	93	403	0	403	48		175	0	175
11:30	100				39				
11:45	115	2.000		2 200	41		2 007		2 007
Total		2,889	0	2,889			3,827	0	3,827
Daily Total		6,716	0	6,716					

Corridor: San Antonio Airport
Master Plan
Count Location: US 281 SB Ramp,

US 281 SB Ramp, Airport SB Entrance, South of Dee Howard Way



1			AM					PM		
Time	Direc	ction	Aivi	Hourly Totals		Dire	ction		Hourly Totals	
Tillie			Southhound		Both Directions					Both Directions
12:00	34	Hortinbouria	Couribound	rtortribouria	Both Bhootions	126	Horarboaria	Couribound	rtortribouria	Dour Directions
12:15	28					122				
12:30	11		81	0	81	111		464	0	464
12:45	8					105				
01:00	24					112				
01:15	11					114				
01:30	13		78	0	78	104		451	0	451
01:45	30					121				
02:00	16					111				
02:00	5					113				
02:30	7		35	0	35	135		489	0	489
02:45	7					130				
03:00	7					196				
03:15	5					131				
03:30	9		36	0	36	120		617	0	617
03:45	15					170				
04:00	15					156				
04:00	23					140				
04:30	24		108	0	108	146		566	0	566
04:30	46					124				
05:00	23					186				
05:00	25					117				
05:30	34		110	0	110	117		524	0	524
05:45	28					109				
06:00	38					113				
06:15	32					94				
06:30	48		152	0	152	78		337	0	337
06:45	34					52				
07:00	61					53				
07:15	69					51				
07:13	80		255	0	255	44		210	0	210
07:45	45					62				
08:00	62					66				
08:15	59					44				
08:30	58		256	0	256	57		199	0	199
08:45	77					32				1
09:00	62					41				
09:00	99					43				1
09:30	78		315	0	315	37		158	0	158
09:45	76					37				
10:00	91					22				
10:15	75					23				
10:30	89		339	0	339	33		106	0	106
10:45	84					28				1
11:00	124					45				
11:15	118					48				1
11:30	115		478	0	478	38		169	0	169
11:45	121					38				
Total	141		2,243	0	2,243	- 00		4,290	0	4,290
Daily Total			6,533	0	6,533			-,20	<u> </u>	-,200



Corridor: San Antonio Airport Master Plan

Count Location: US 281 NB Ramp,
Airport Blvd NB Exit
(South of Loop 410)



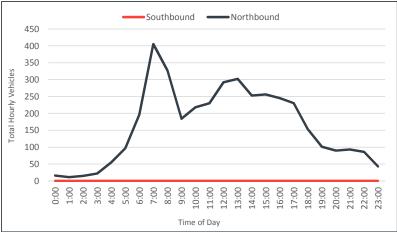
Time of Day

	ı		AM					PM		
Time	Direc	ction		Hourly Totals		Direc	tion		Hourly Totals	
Time	Southbound		Southbound		Both Directions					
12:00	Southbound	39	Southbound	Northbourid	Both Directions	Southbound	142	Southbound	Northbourid	Both Directions
12:00		39					157			
12:15		31	0	119	119			0	605	605
							135			
12:45		17					171			
01:00		22					140			
01:15		13	0	74	74		153	0	611	611
01:30		25					156			
01:45		14					162			
02:00		18					166			
02:15		22	0	77	77		179	0	678	678
02:30		20					157			
02:45		17					176			
03:00		24					169			
03:15		19	0	94	94		183	0	730	730
03:30		25					194			
03:45		26					184			
04:00		26					165			
04:15		34	0	120	120		181	0	726	726
04:30		23					191			
04:45		37					189			
05:00		29					214			
05:15		45	0	194	194		219	0	789	789
05:30		52					186			
05:45		68					170			
06:00		92					147			
06:15		105	0	516	516		133	0	492	492
06:30		129					99			
06:45		190					113			
07:00		143					110			
07:15		168	0	667	667		103	0	405	405
07:30		167					91			
07:45		189					101			
08:00		163					68			
08:15		141	0	537	537		69	0	270	270
08:30		113					62			
08:45		120					71			
09:00		124					69			
09:15		90	0	416	416		72	0	293	293
09:30		87					86			
09:45		115					66			
10:00		117					96			
10:15		94	0	442	442		83	0	323	323
10:30		109					71			
10:45		122					73			
11:00		113					58			
11:15		141	0	522	522		73	0	250	250
11:30		131					57			
11:45		137					62			
Total			0	3,778	3,778			0	6,172	6,172
Daily Total			0	9,950	9,950					



Corridor: San Antonio Airport Master Plan US 281 NB Ramp, Count Location:

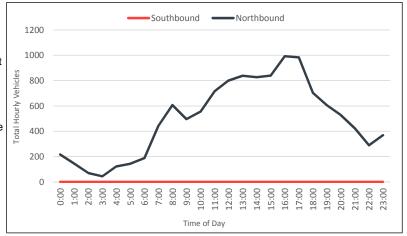
Jones Maltsberger Rd-Dee Howard NB Exit



		AM					PM		
Time	Direction		Hourly Totals		Direc	ction		Hourly Totals	i
	Southbound Northbound			Both Directions					Both Directions
12:00	8					78			
12:15	5	_				64	_		
12:30	2	0	16	16		74	0	292	292
12:45	1					76			
01:00	5					88			
01:15	1	_				71	_		
01:30	3	0	11	11		73	0	302	302
01:45	2					70			
02:00	2					55			
02:15	3					60			
02:30	5	0	15	15		69	0	253	253
02:45	5					69			
03:00	7					59			
03:15	6					61			
03:30	6	0	22	22		82	0	256	256
03:45	3					54			
03:43	6					65			
04:05	12					63			
04:30	18	0	55	55		62	0	245	245
04:45	19					55			
05:00	7					66			
05:00	22					51			
05:30	23	0	97	97		52	0	230	230
05:45	45					61			
06:00	28					48			
06:00	36					39			
06:30	45	0	197	197		39	0	153	153
06:45	88					27			
07:00	71					27			
07:00	88					30			
07:13	113	0	405	405		18	0	101	101
07:30	133					26			
08:00	97					19			
08:15	80					30			
08:30	80	0	327	327		22	0	90	90
08:45	70					19			
09:00	53					21			
09:00	44					21			
09:10	48	0	184	184		27	0	93	93
09:45	39					24			
10:00	42					25			
10:00	62					24			
10:30	51	0	218	218		21	0	86	86
10:45	63					16			
11:00	53					11			
11:15	49					11			
11:30	69	0	230	230		11	0	43	43
11:45	59					10			
Total	J9	0	1,777	1,777		10	0	2,144	2,144
Daily Total		0	3,921	3,921				4,177	۲, ۱۳۳

Corridor: San Antonio Airport Master Plan

Count Location: US 281 NB Ramp,
Jones Maltsberger
Rd-Dee HowardAirport NB Entrance



		AM					PM		
Time	Direction		Hourly Totals		Dire	ction		Hourly Totals	
	Southbound Northbound			Both Directions	Southbound				Both Directions
12:00	61					176			
12:15	75		047	047		226		004	004
12:30	42	0	217	217		187	0	801	801
12:45	39					212			
01:00	35					187			
01:15	34		4.45	4.45		229		000	000
01:30	27	0	145	145		205	0	838	838
01:45	49					217			
02:00	36					182			
02:15	15					192		007	
02:30	12	0	70	70		227	0	827	827
02:45	7					226			
03:00	7					215			
03:15	13					200			
03:30	14	0	44	44		200	0	839	839
03:45	10					224			
04:00	24					265			
04:15	20					256			
04:30	39	0	122	122		264	0	992	992
04:45	39					207			
05:00	32					260			
05:15	44					259			
05:30	24	0	143	143		243	0	983	983
05:45	43					221			
06:00	33					182			
06:15	48					183			
06:30	48	0	188	188		171	0	703	703
06:45	59					167			
07:00	59					152			
07:15	101					136			
07:30	104	0	442	442		164	0	606	606
07:45	178					154			
08:00	179					162			
08:15	199					118			
08:30	120	0	607	607		113	0	528	528
08:45	109					135			
09:00	129					104			
09:00	119					117			
09:30	120	0	496	496		83	0	423	423
09:45	128					119			
10:00	132					72			
10:00	126					56			
10:30	164	0	555	555		68	0	289	289
10:45	133					93			
11:00	174					89			
11:15	182					91			
11:30	190	0	714	714		86	0	368	368
11:45	168					102			
Total	100	0	3,743	3,743		102	0	8,197	8,197
iolai		0	11,940	11,940			J J	0,131	0,137

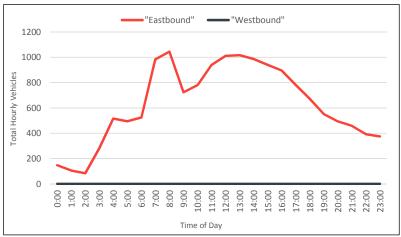
08-Jun-18 Fri

Corridor:

San Antonio Airport Master Plan

Count Location:

Loop 410 EB Ramp, Airport Blvd Exit (East of Jones Maltsberger)



	T		AM					PM		
Time	Diro	ction	Alvi	Hourly Totals		Diro	ection	1 101	Hourly Totals	
Tille	Eastbound	Westbound	Eastbound		Both Directions	Eastbound	Westbound	Eastbound		Both Directions
12:00	40	Westbourid	Lastbourid	Westbourid	Dotti Directions	260	Westbouria	Lasibouriu	VVESIDOUNG	Dotti Directions
12:15	38					248				
12:30	35		147	0	147	262		1,011	0	1,011
12:45	34					241				
01:00	33					247				
01:15	24					255				
01:30	20		106	0	106	254		1,016	0	1,016
01:45	29					260				
02:00	29					265				
02:00	12					252				
02:15	17		84	0	84	232		986	0	986
02:30	33					245				
	36					227				
03:00										
03:15 03:30	73 79		283	0	283	241 265		939	0	939
03:45	95					206				
04:00	109					230				
04:15	135		516	0	516	212		895	0	895
04:30	107					215				
04:45	165					238				
05:00	102					198				
05:15	114		495	0	495	200		782	0	782
05:30	117					208				
05:45	162					176				
06:00	97					187				
06:15	102		525	0	525	146		671	0	671
06:30	153					175				
06:45	173					163				
07:00	198					136				
07:15	237		984	0	984	134		552	0	552
07:30	258					143				
07:45	291					139				
08:00	409					131				
08:15	262		1,044	0	1,044	132		493	0	493
08:30	196		.,0	ŭ	.,	124		.00	Ĭ	
08:45	177					106				
09:00	171					105				
09:15	178		723	0	723	123		458	0	458
09:30	167		. 20		. 20	103		.50		
09:45	207					127				
10:00	195					87				
10:15	191		780	0	780	89		393	0	393
10:30	187		. 50		. 50	108		550		300
10:45	207					109				
11:00	193					112				
11:15	242		939	0	939	109		375	0	375
11:30	248		555	3	555	92		0,0		3,3
11:45	256					62				
Total	·		6,626	0	6,626			8,571	0	8,571
Daily Total			15,197	0	15,197					·

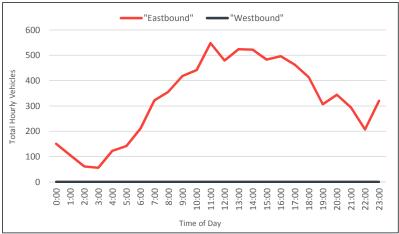
08-Jun-18 Fri

Corridor: San Antonio Airport

Master Plan

Count Location:

Loop 410 EB Ramp, Airport Blvd Entrance (East of Wetmore Rd)



			AM					PM		
Time	Dire	ction	Alvi	Hourly Totals		Dire	ction	1 101	Hourly Totals	,
Time	Eastbound	Westbound	Eastbound		Both Directions	Eastbound	Westbound	Eastbound		Both Directions
12:00	48	Woodboaria	Luotbouria	Weekbearia	Both Birodiono	127	Woolboana	Laotodila	Wootboaria	Dotti Diroctiono
12:15	53					119				
12:30	23		150	0	150	120		479	0	479
12:45	26					113				
01:00	33					143				
01:15	25					150				
01:30	18		105	0	105	114		524	0	524
01:45	29					117				
02:00	21					155				
02:15	23					122				
02:30	11		61	0	61	142		522	0	522
02:45	6					103				
03:00	12					132				
03:15	7					115				
03:30	19		56	0	56	120		483	0	483
03:45	18					116				
04:00	27					126				
04:00	25					113				
04:30	27		122	0	122	130		496	0	496
04:45	43					127				
05:00	36					137				
05:15	38					136				
05:30	28		141	0	141	93		463	0	463
05:45	39					97				
06:00	50					130				
06:15	46					106				
06:30	59		210	0	210	94		413	0	413
06:45	55					83				
07:00	90					72				
07:15	65					70				
07:30	80		322	0	322	77		307	0	307
07:45	87					88				
08:00	97					88				
08:15	78					79				
08:30	83		356	0	356	95		344	0	344
08:45	98					82				
09:00	125					71				
09:15	97		440		440	66		00.1	_	00.4
09:30	99		418	0	418	88		294	0	294
09:45	97					69				
10:00	109					53				
10:15	103		444		444	49		007		007
10:30	120		441	0	441	49		207	0	207
10:45	109					56				
11:00	144					79				
11:15	160		E 40		E40	88		200		200
11:30	132		548	0	548	67		320	0	320
11:45	112					86				
Total			2,930	0	2,930			4,852	0	4,852
Daily Total			7,782	0	7,782			•		*

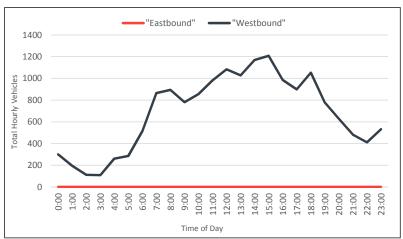
08-Jun-18 Fri

Corridor: San Antonio Airport

Master Plan

Count Location:

Loop 410 WB Ramp, Airport Blvd WB Entrance (East of Jones Maltsberger)



			AM					PM		
Time	Direc	ction		Hourly Totals		Dire	ction		Hourly Totals	
	Eastbound	Westbound	Eastbound	Westbound	Both Directions	Eastbound	Westbound	Eastbound	Westbound	Both Directions
12:00		112					259			
12:15		89	0	200	200		270	0	4.000	4.000
12:30		41	0	299	299		259	U	1,082	1,082
12:45		57					294			
01:00		35					268			
01:15		45	0	404	404		249		4 000	4 000
01:30		35	0	194	194		254	0	1,026	1,026
01:45		79					255			
02:00		58					313			
02:15		18			440		266		4 400	4 400
02:30		18	0	112	112		311	0	1,169	1,169
02:45		18					279			
03:00		19					300			
03:15		22	_				317	_		
03:30		32	0	108	108		303	0	1,208	1,208
03:45		35					288			
04:00		46					296			
04:15		60					252			
04:30		89	0	261	261		217	0	986	986
04:45		66					221			
05:00		85					219			
05:15		66					232			
05:30		65	0	285	285		208	0	898	898
05:45		69					239			
06:00		81					279			
06:15		136					305			
06:30		120	0	515	515		232	0	1,051	1,051
06:45		178					235			
07:00		183					204			
07:15		231					190			
07:30		234	0	864	864		191	0	777	777
07:45		216					192			
08:00		193					166			
08:15		247	_				160	_		
08:30		226	0	894	894		173	0	628	628
08:45		228					129			
09:00		198					116			
09:15		203	0	700	700		123		404	404
09:30		191	0	780	780		113	0	481	481
09:45		188					129			
10:00		195					93			
10:15		215	0	055	055		82		444	444
10:30		207	0	855	855		121	0	411	411
10:45		238					115			
11:00		233					136			
11:15		250		004	004		127		500	500
11:30		232	0	981	981		120	0	532	532
11:45		266					149			
Total			0	6,148	6,148			0	10,249	10,249
Daily Total			0	16,397	16,397					

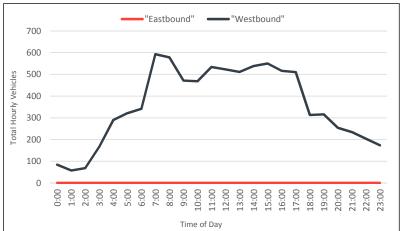
Weekday: Fri
Corridor: San Antonio Airport

Master Plan

08-Jun-18

Count Location:

Loop 410 WB Ramp, Airport Blvd WB Exit (From US 281 Direct Connectors)



12:00   26			AM				PM			
12:00   26	Time	Direction		Hourly Totals		Dire	ction		Hourly Totals	1
12:15		Eastbound Westbound	Eastbound	Westbound	Both Directions	Eastbound	Westbound	Eastbound	Westbound	Both Directions
12:30	12:00	26					128			
12:30	12:15	17	0	0.4	0.4		132	_	522	522
01:00	12:30	17	U	04	04		121	0	523	523
01:15 9 0 57 57 125 0 511 511 511 01:45 130 144 15 130 157 57 132 0 511 511 511 132 0 145 133 137 0 145 133 137 0 145 133 137 0 145 133 137 0 145 133 137 0 145 133 137 0 145 133 137 0 145 133 137 0 145 133 137 0 145 134 134 134 134 134 134 134 134 134 134	12:45	24					142			
01:30	01:00	21					117			
01:30	01:15	9	0	E 7	E-7		125		E11	E11
02:00	01:30	14	U	57	57		132	U	511	511
02:15         9         0         68         68         154         0         538         538           02:30         17         0         68         68         130         0         538         538           02:45         24         134         134         34	01:45	13					137			
02:30	02:00	18					120			
02:30	02:15	9	0	CO	00		154	0	500	520
03:00	02:30	17	U	68	68		130	0	538	538
03:15	02:45	24					134			
03:30 57 0 167 167 144 0 550 550 0 345 56 0 127 0 400 68 129 0 129 0 516 516 516 0 445 61 116 0 500 611 69 0 1510 0 510 510 0 510 510 0 51	03:00	24					134			
03:30 57	03:15	30		407	407		145		550	550
04:00	03:30	57	0	167	167		144	0	550	550
04:00	03:45	56					127			
04:30         82         0         289         289         129         0         516         516           04:45         61         116         116         116         116         116         117										
04:30 82 129 129 04:45 61 116 05:00 61 05:00 61 137 05:15 69 0 321 321 1321 152 0 510 510 510 05:45 101 106 06:00 72 06:15 79 0 342 342 78 0 313 313 06:30 75 06:45 116 05:00 130 07:15 142 0 593 593 71 0 316 316 07:30 145 167 08:15 140 0 578 578 62 0 254 254 08:45 154 09:00 123 09:00 123 09:00 123 09:00 123 09:00 123 09:45 129 10:00 129 10:15 94 10:00 126 11:00 126	04:15	78					142		=40	<b>540</b>
05:00	04:30	82	0	289	289		129	0	516	516
05:00										
05:15         69         0         321         321         152         0         510         510           05:30         90         0         321         321         115         0         510         510           05:45         101         106         106         106         115         0         115         0         116         0         100         <										
05:30										
05:45			0	321	321			0	510	510
O6:00										
06:15         79         0         342         342         78         0         313         313           06:30         75         0         342         342         84         0         313         313           06:45         116         58         58         0         316         313         313           07:00         130         87         58         65         0         316         316         316           07:15         142         0         593         593         65         0         316										
06:30         75         0         342         342         84         0         313         313           06:45         116         58         58         0         316         316           07:00         130         65         0         316         316         316           07:15         142         0         593         593         65         0         316         316           07:45         167         93         71         0         316         316         316           08:00         145         72										
06:45			0	342	342			0	313	313
07:00         130         65         316 <td></td>										
07:15         142         0         593         593         65         0         316         316           07:30         154         0         593         593         71         0         316         316           07:45         167         93         72         0         0         0         72         0         0         254         254         254         0         0         254         254         254         254         0         0         254         254         254         0         254         254         254         254         0         254 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
07:30         154         0         593         593         71         0         316         316           08:00         145         93         72         93         72										
07:45         167         93         254         254           08:00         145         72         254         254           08:15         140         0         578         578         67         0         254         254           08:30         139         578         62         0         254         254           08:45         154         53         57         0         234         234           09:00         123         57         0         234         234           09:15         101         0         471         471         54         0         234         234           09:45         129         43         234         234         234         234           10:00         129         43         43         203         203         203           10:30         117         66         60         203         203         203           11:00         126         60         60         11:15         134         0         534         534         49         0         173         173         173           11:30         144         30         30         <			0	593	593			0	316	316
08:00         145           08:15         140           08:30         139           08:45         154           09:00         123           09:15         101           09:30         118           09:45         129           10:15         94           10:30         117           10:45         128           11:00         126           11:30         144           11:30         144           11:45         130           Total         0           578         67           62         0           234         254           254         254           254         254           254         254           254         254           254         254           254         254           254         254           254         254           257         234           234         234           234         234           234         234           235         234           236         234 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
08:15         140         0         578         578         67         0         254         254           08:30         139         0         578         62         0         254         254           08:45         154         53         53         53         53         54         53           09:00         123         57         56         0         234         234           09:15         101         0         471         471         55         0         234         234           09:30         118         0         471         471         54         0         234         234           09:45         129         43         43         0         203         203         203           10:15         94         0         468         45         0         203         203           10:30         117         128         60         0         0         173         173           11:30         144         0         534         534         49         0         173         173           11:45         130         30         30         30         30										
08:30     139     0     578     578     62     0     254     254       08:45     154     53     57     09:00     123     57     09:15     101     0     471     471     65     0     234     234       09:30     118     0     471     471     54     0     234     234       09:45     129     43     45     0     203     203       10:15     94     0     468     45     0     203     203       10:30     117     0     468     60     0     0     203     203       11:00     126     60     60     0     173     173       11:30     144     0     534     534     49     0     173     173       11:45     130     30     30     0     4,641     4,641										
08:45         154         53         99:00         123         57         99:15         101         0         471         471         65         0         234			0	578	578			0	254	254
09:00         123           09:15         101         0         471         471         65         0         234         234           09:30         118         0         471         471         54         0         234         234           09:45         129         58         0         234         234           10:00         129         43         45         0         203         203           10:30         117         60         60         0         203         203         203           10:45         128         60										
09:15         101         0         471         471         65         0         234         234           09:45         129         58         58         0         234         234           10:00         129         43         43         45         0         203         203           10:30         117         66         60         0         203         203         203           10:45         128         60         6										
09:30     118     0     471     471     54     0     234     234       09:45     129     58     58     0     234     234       10:00     129     43     43     0     443     0     203     203       10:30     117     10:45     128     60     0     203     203       11:00     126     60     0     0     173     173       11:30     144     0     534     534     49     0     173     173       11:45     130     30     30     0     4,641     4,641										20.4
09:45         129         58           10:00         129         43           10:15         94         0         468         45         0         203         203           10:30         117         55         60         203			U	471	4/1			0	234	234
10:00     129       10:15     94     0       10:30     117       10:45     128       11:00     126       11:15     134     0       11:30     144       11:45     130       Total     0     3,972       3,972     3,972     0       43     43       45     0     203       203     203 <td></td>										
10:15     94     0     468     468     45     0     203     203       10:30     117     60     60     203     203       11:00     126     60     60     11:15     134     0     534     49     0     173     173       11:30     144     34     34     34     34     34     34     34       11:45     130     30     30     30     4,641     4,641										
10:30     117     0     468     468     55     0     203     203       10:45     128     60     60     11:00     126     60     11:15     134     0     534     49     0     173     173       11:30     144     34     34     34     34     34     34     34     34     34     34     34     34     34     34     34     36		-		45-	45-			_	0	0
10:45     128       11:00     126       11:15     134       11:30     144       11:45     130       Total     0       3,972     3,972       60     0       49     0       173     173       173     173       173     173       49     0       34     34       30     30       4,641     4,641			0	468	468			0	203	203
11:00     126       11:15     134     0       11:30     144       11:45     130       Total     0       3,972     3,972       60     0       49     0       34     34       30     30       173     173       4,641     4,641										
11:15     134     0     534     534     49     0     173     173       11:30     144     34 </td <td></td>										
11:30			_					_		
11:45         130         30         4,641         4,641         4,641           Total         0         3,972         3,972         0         4,641         4,641			0	534	534			0	173	173
Total 0 3,972 3,972 0 4,641 4,641										
· · · · · · · · · · · · · · · · · · ·			0	3,972	3,972			0	4,641	4,641
1 Daliy (Dia) U 0.013 0.013	Daily Total		0	8,613	8,613			-	.,	.,•



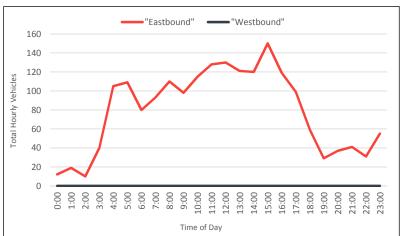
08-Jun-18

Fri Corridor:

San Antonio Airport Master Plan

Count Location:

Airport Flyover, From US 281 to Terminals (East of Split)



	ı		AM					PM		
Time	Dire	ction	Alvi	Hourly Totals		Dire	ction		Hourly Totals	,
Time	Eastbound	Westbound	Eastbound		Both Directions	Eastbound	Westbound	Eastbound		Both Directions
12:00	7	TT COLD CUTTO	Laciboana	77 COLD CUITA	2011 21100110110	32	77000000110	Laciboana	***************************************	Dour Dirocuorio
12:15	2					42				
12:30	0		12	0	12	30		130	0	130
12:45	3					26				
01:00	6					30				
01:15	5					30				
01:30	4		19	0	19	30		121	0	121
01:45	4					31				
02:00	4					26				
02:15	1					31				
02:30	0		10	0	10	30		120	0	120
02:45	5					33				
03:00	9					40				
03:15	6					45				
03:30	11		40	0	40	35		150	0	150
03:45	14					30				
04:00	22					29				
04:00	24					27				
04:30	30		105	0	105	27		119	0	119
04:45	29					36				
05:00	34					25				
05:15	28					23				
05:30	24		109	0	109	28		99	0	99
05:45	23					23				
06:00	19					17				
06:15	17					16				
06:30	20		80	0	80	13		59	0	59
06:45	24					13				
07:00	26					5				
07:15	21					3				
07:30	20		93	0	93	8		29	0	29
07:45	26					13				
08:00	29					10				
08:15	33			_		13			_	
08:30	22		110	0	110	8		37	0	37
08:45	26					6				
09:00	26					9				
09:15	21		0-	_	0-	7			_	
09:30	25		98	0	98	13		41	0	41
09:45	26					12				
10:00	30					7				
10:15	28		44-		4,-	8		0.4	_	6.1
10:30	22		115	0	115	8		31	0	31
10:45	35					8				
11:00	30					14				
11:15	33		400		400	14			0	
11:30	31		128	0	128	16		55	0	55
11:45	34					11				
Total	•		919	0	919			991	0	991
Daily Total			1,910	0	1,910					

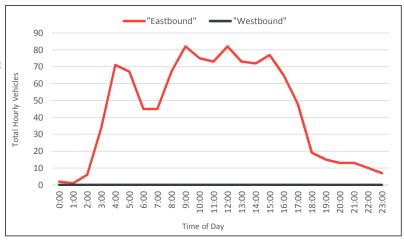
08-Jun-18 Fri

Corridor: San Antonio Airport

Master Plan

Count Location: Airport Flyover, From US 281 to Parking (East of

Split)



			AM					PM		
Time	Diro	ction	Alvi	Hourly Totals		Direction Hourly Totals				
Tille	Eastbound	Westbound	Eastbound		Both Directions	Eastbound	Westbound	Eastbound		Both Directions
12:00	0	vvestbourid	Lastbourid	Westbouria	Dotti Directions	19	Westbouria	Lasibouriu	VVESIDOUNG	Dotti Directions
12:15	2					25				
12:30	0		2	0	2	21		82	0	82
12:45	0					17				
01:00	0					23				
01:00	1					19				
01:30	0		1	0	1	14		73	0	73
01:45	0					17				
02:00	2					17				
02:15	3					19				
02:30	0		6	0	6	18		72	0	72
02:45	1					18				
03:00	2					18				
03:15	5					18				
03:30	15		34	0	34	19		77	0	77
03:45	12					22				
04:00	18					22				
04:15	14					22				
04:30	20		71	0	71	6		65	0	65
04:45	19					15				
05:00	12					14				
05:15	10			_		6			_	
05:30	20		67	0	67	15		48	0	48
05:45	25					13				
06:00	11					8				
06:15	12		45	0	45	2		40	0	40
06:30	7		45	0	45	6		19	0	19
06:45	15					3				
07:00	11					5				
07:15	9		45	0	45	1		15	0	15
07:30	8		40	U	45	6		15	U	15
07:45	17					3				
08:00	16					4				
08:15	16		67	0	67	3		13	0	13
08:30	25		01	J	, , , , , , , , , , , , , , , , , , ,	3		,,,		'5
08:45	10					3				
09:00	18					3				
09:15	19		82	0	82	4		13	0	13
09:30	18					2				
09:45	27					4				
10:00	19					2				
10:15	13		75	0	75	5		10	0	10
10:30	16		-	-		3				
10:45	27					0				
11:00	18					2				
11:15	21		73	0	73	0		7	0	7
11:30	22					5				
11:45	12		ECO	•	ECO	0		404		404
Total			568 1,062	0	568 1,062			494	0	494
Daily Total			1,062	U	1,00∠					

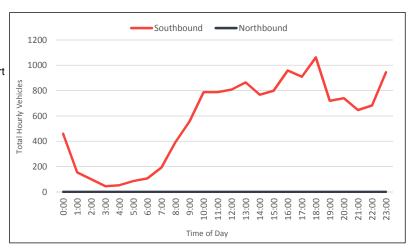


Count Location:

08-Jun-18

Corridor:

San Antonio Airport
Master Plan
Terminal DriveSouthboundDownstream of
Pickup Lanes



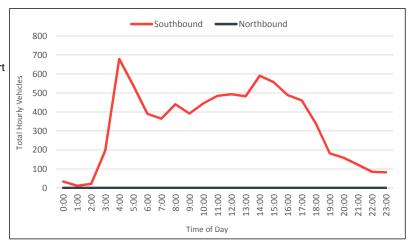
		AM					PM		
Time	Direction		Hourly Totals		Dire	ction		Hourly Totals	3
	Southbound Northbound	Southbound	Northbound	Both Directions	Southbound	Northbound	Southbound	Northbound	Both Directions
12:00	204				194				
12:15	118	459	0	459	185		808	0	808
12:30	79	459	U	459	202		808	U	808
12:45	58				227				
01:00	35				212				
01:15	56	454	0	454	225		005	0	005
01:30	49	154	U	154	234		865	0	865
01:45	14				194				
02:00	27				213				
02:15	41	00		00	199		707	0	707
02:30	19	99	0	99	197		767	0	767
02:45	12				158				
03:00	11				180				
03:15	10	l			163				
03:30	10	45	0	45	202		799	0	799
03:45	14				254				
04:00	13				293				İ
04:15	9				267				
04:30	19	52	0	52	238		958	0	958
04:45	11				160				
05:00	22				202				
05:15	18				247				
05:30	25	86	0	86	221		909	0	909
05:45	21				239				
06:00	21				301				
06:15	23				274				
06:30	40	107	0	107	274		1,062	0	1,062
06:45	23				213				
07:00	51				208				
07:15	46				131				
07:30	46	191	0	191	158		719	0	719
07:45	48				222				
08:00	56				306				
08:15	67				207				
08:30	121	393	0	393	101		740	0	740
08:45	149				126				
09:00	149				204				1
09:00	130				141				1
09.15	139	556	0	556	172		646	0	646
09.30	147				172				
10:00	225				129				+
10:00	209				200				1
10:15	151	788	0	788	178		683	0	683
10:30	203				178				
10:45	191				273				<del> </del>
									1
11:15	177	788	0	788	274		945	0	945
11:30	193				185				
11:45	227	0.740		0.740	213		0.004		0.004
Total		3,718	0	3,718			9,901	0	9,901
Daily Total		13,619	0	13,619					



Data Date: Weekday: Corridor: 08-Jun-18 Fri

Count Location:

San Antonio Airport Master Plan Terminal Drive-Southbound-Downstream of Dropoff Lanes

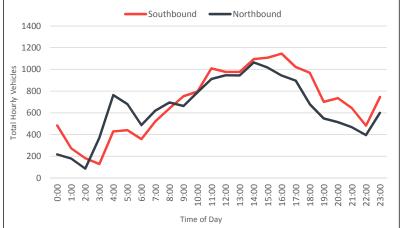


		AM				PM		
Time	Direction		Hourly Totals		Direction		Hourly Totals	1
	Southbound Northbound	Southbound	Northbound	Both Directions	Southbound Northbound	Southbound	Northbound	Both Directions
12:00	14				126			
12:15	11				136	400		400
12:30	5	33	0	33	117	493	0	493
12:45	3				114			
01:00	3				115			
01:15	4				119			
01:30	3	11	0	11	124	482	0	482
01:45	1				124			
02:00	1				146			
02:15	3				132			
02:30	7	22	0	22	160	590	0	590
02:45	11				152			
03:00	14				143			
03:15	38				133			
03:30	60	198	0	198	145	556	0	556
03:45	86				135			
04:00	129				109			
04:15	183				117			
04:30	198	678	0	678	150	488	0	488
04:45	168				112			
05:00	164				111			
05:15	142				133			
05:30	118	539	0	539	106	460	0	460
05:45	115				110			
06:00	111				83			
06:15	90				86			
06:30	95	390	0	390	92	339	0	339
06:45	94				78			
07:00	97				54			
07:15	87				29			
07:30	83	364	0	364	41	182	0	182
07:45	97				58			
08:00	104				58			
08:15	109				34			
08:30	129	440	0	440	38	158	0	158
08:45	98				28			
09:00	82				47			
09:15	102				25	400		400
09:30	105	391	0	391	25	122	0	122
09:45	102				25			
10:00	115				25			
10:15	100		_		27	g -	_	
10:30	103	445	0	445	22	85	0	85
10:45	127				11			
11:00	109				32			
11:15	114	405	0	405	26	60		
11:30	146	485	0	485	9	82	0	82
11:45	116				15			
Total		3,996	0	3,996		4,037	0	4,037
Daily Total		8,033	0	8,033				

Data Date: Weekday: Corridor: 08-Jun-18 Fri

Corridor: San Antonio Airport
Master Plan
Count Location: Airport Blvd,
Between Northern

Between Northern Blvd & Terminal Dr



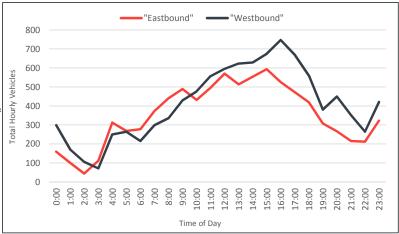
			AM					PM		
Time	Direc	ction		Hourly Totals		Direction Hourly Totals				
	Southbound	Northbound			Both Directions		Northbound	Southbound		
12:00	179	76				222	249			
12:15	158	72	400	040	000	272	242	077	0.45	4 000
12:30	99	35	483	216	699	242	222	977	945	1,922
12:45	47	33				241	232			
01:00	59	46				241	244			
01:15	91	34	070	470	450	286	217	077	044	4.004
01:30	40	40	272	178	450	214	241	977	944	1,921
01:45	82	58				236	242			
02:00	104	31				280	248			
02:15	37	19				263	264			
02:30	22	10	181	85	266	286	300	1,094	1,064	2,158
02:45	18	25				265	252			
03:00	18	43				281	247			
03:15	25	82				287	228			
03:30	36	105	128	370	498	270	246	1,107	1,017	2,124
03:45	49	140				269	296			
04:00	75	172				304	252			
04:15	109	192				295	239			
04:30	127	212	429	763	1,192	281	246	1,145	942	2,087
04:45	118	187				265	205			
05:00	125	224				253	243			
05:15	118	154				295	220			
05:30	102	150	440	680	1,120	233	220	1,021	896	1,917
05:45	95	152				240	213			
06:00	80	141				272	189			
06:00	93	111				254	201			
06:30	88	105	357	486	843	243	143	967	679	1,646
06:45	96	129				198	146			
07:00	130	153				172	136			
07:00	144	145				156	114			
07:13	117	169	521	620	1,141	172	142	701	547	1,248
07:30	130	153				201	155			
08:00	141	167				177	148			
08:00	160	161				205	134			
08:30	173	174	640	695	1,335	191	134	735	514	1,249
08:45	166	193				162	87			
09:00	201	175				135	101			
09:00	181	162				162	121			
09:15	165	171	752	663	1,415	169	121	642	467	1,109
09:30	205	155				176	119			
10:00	175	200				121	85			
10:00	215	196				106	93			
10:15	213	200	795	790	1,585	120	111	482	394	876
	192	194				135	105			
10:45 11:00	240	226				160	157			
						202	157			
11:15	295	239	1,009	911	1,920			745	600	1,345
11:30	249	243				187	142			
11:45	225	203	6.007	C 457	10.464	196	147	40.502	0.000	40.000
Total			6,007	6,457	12,464			10,593	9,009	19,602
Daily Total			16,600	15,466	32,066					

08-Jun-18 Fri

Corridor: San Antonio Airport
Master Plan

Count Location:

Dee Howard-Terminal Dr, West of Airport Blvd



						PM		
Eastbound   Westbound   12:00	Hourly Totals	lourly Totale		Direction Hourly Totals				,
12:00         45         100           12:15         58         100           12:30         28         65           12:45         28         34           01:00         20         42           01:15         37         45           01:30         18         31           01:45         25         53           02:00         21         61           02:30         7         9           02:45         10         14           03:00         18         15           03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61           05:30         68         62           05:45         63         67           06:00         75         64           06:15         54         48           06:30         72         50	•		Both Directions	Eastbound	Westbound	Eastbound		Both Directions
12:15         58         100         159           12:30         28         65         159           12:45         28         34         34           01:00         20         42         42           01:15         37         45         100           01:30         18         31         100           01:45         25         53         100           02:00         21         61         61           02:30         7         9         44           02:30         7         9         44           03:30         7         9         112           03:30         33         13         112           03:30         33         13         112           03:30         33         13         112           03:30         33         13         112           03:30         33         13         112           04:40         56         42         42         44           04:30         85         70         44         468         468           05:00         76         74         468         468         468	Westboaria	WCStbouria	Dotti Directions	141	119	Lasiboana	VVCStbound	DOIN DIRECTIONS
12:30         28         65           12:45         28         34           01:00         20         42           01:15         37         45           01:30         18         31           01:45         25         53           02:00         21         61           02:15         6         21           02:30         7         9           02:45         10         14           03:00         18         15           03:15         20         10           03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61           05:30         68         62           05:45         63         67           06:00         75         64           06:15         54         48           06:30         72         50 <td></td> <td></td> <td></td> <td>141</td> <td>168</td> <td></td> <td></td> <td></td>				141	168			
12:45         28         34           01:00         20         42           01:15         37         45           01:30         18         31           01:45         25         53           02:00         21         61           02:15         6         21           02:30         7         9           02:45         10         14           03:00         18         15           03:15         20         10           03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61           05:30         68         62           05:45         63         67           06:00         75         64           06:15         54         48           06:30         72         50           06:45         77         53 <td>299</td> <td>299</td> <td>458</td> <td>136</td> <td>157</td> <td>570</td> <td>595</td> <td>1,165</td>	299	299	458	136	157	570	595	1,165
01:00         20         42           01:15         37         45           01:30         18         31           01:45         25         53           02:00         21         61           02:15         6         21           02:30         7         9           02:45         10         14           03:00         18         15           03:15         20         10           03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61         61           05:30         68         62         268           05:45         63         67         66           06:00         75         64         64           06:30         72         50         66           06:45         77         53         70           07:45				152	151			
01:15         37         45         100           01:30         18         31         100           01:45         25         53         100           02:00         21         61         61           02:15         6         21         44           02:30         7         9         44           02:45         10         14         10           03:00         18         15         112           03:30         33         13         112           03:30         33         13         112           03:30         33         13         112           03:345         41         33         12           04:00         56         42         42           04:15         75         54         312           04:30         85         70         312           04:45         96         84         405:00         76         74           05:15         61         61         61         268           05:45         63         67         66         44         278           06:00         75         64         48				137	147			
01:30         18         31           01:45         25         53           02:00         21         61           02:15         6         21           02:30         7         9           02:45         10         14           03:00         18         15           03:15         20         10           03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61         268           05:30         68         62         268           05:45         63         67         64           06:00         75         64         268           06:45         77         53         278           06:45         77         53         278           06:45         77         53         373           07:00         101         60         76				113	175			
01:45         25         53           02:00         21         61           02:15         6         21           02:30         7         9           02:45         10         14           03:00         18         15           03:15         20         10           03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61         268           05:30         68         62         268           05:45         63         67         64           06:00         75         64         278           06:30         72         50         373           07:00         101         60         373           07:30         82         70         373           07:45         111         74         373           08:15         109         73	171	171	271	120	139	513	623	1,136
02:00         21         61           02:15         6         21           02:30         7         9           02:45         10         14           03:00         18         15           03:15         20         10           03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61         268           05:30         68         62         268           05:45         63         67         64           06:00         75         64         268           06:30         72         50         20           06:45         77         53         278           07:00         101         60         373           07:30         82         70         373           07:45         111         74         74           08:00         105				143	162			
02:15         6         21           02:30         7         9           02:45         10         14           03:00         18         15           03:15         20         10           03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61           05:30         68         62           05:45         63         67           06:00         75         64           06:15         54         48           06:30         72         50           06:45         77         53           07:00         101         60           07:15         79         94           07:30         82         70           07:45         111         74           08:00         105         78           08:15         109         73				135	150			
02:30         7         9         44           02:45         10         14         14           03:00         18         15         15         112           03:15         20         10         112         112           03:30         33         13         33         13           04:00         56         42         42         42           04:15         75         54         312         312           04:45         96         84         312         312           05:00         76         74 <td< td=""><td></td><td></td><td></td><td>123</td><td>164</td><td></td><td></td><td></td></td<>				123	164			
02:45         10         14           03:00         18         15           03:15         20         10           03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61         61           05:30         68         62         62           05:45         63         67         66           06:00         75         64         64           06:15         54         48         278           06:30         72         50         278           06:45         77         53         278           07:00         101         60         373           07:30         82         70         373           07:45         111         74         373           08:15         109         73         440           08:30         108         85	105	105	149	146	166	554	629	1,183
03:00         18         15           03:15         20         10           03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61         61           05:30         68         62         62           05:45         63         67         64           06:00         75         64         66           06:15         54         48         278           06:30         72         50         66           06:45         77         53         70           07:00         101         60         72           07:00         101         60         72           07:30         82         70         70           07:45         111         74         74           08:00         105         78         78           08:15         109         73				150	149			
03:15         20         10         112           03:30         33         13         13           03:45         41         33         33         13           04:00         56         42         42         42         42           04:15         75         54         312				153	188			
03:30         33         13           03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61         268           05:30         68         62         268           05:45         63         67         64           06:00         75         64         278           06:30         72         50         206:45         77           06:45         77         53         370         373           07:00         101         60         373         373           07:30         82         70         373         373           07:45         111         74         373         373           08:15         109         73         440         440           08:15         109         73         440         489           09:00         102         126         372         373           09:30         108				126	185			
03:45         41         33           04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61         61           05:30         68         62         68           05:45         63         67         64           06:00         75         64         64           06:30         72         50         66:45         77         53           07:00         101         60         70	71	71	183	135	147	593	674	1,267
04:00         56         42           04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61           05:30         68         62           05:45         63         67           06:00         75         64           06:15         54         48           06:30         72         50           06:45         77         53           07:00         101         60           07:15         79         94           07:30         82         70           07:45         111         74           08:00         105         78           08:15         109         73         440           08:30         108         85           08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00 <td< td=""><td></td><td></td><td></td><td>179</td><td>154</td><td></td><td></td><td></td></td<>				179	154			
04:15         75         54           04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61           05:30         68         62           05:45         63         67           06:00         75         64           06:15         54         48           06:30         72         50           06:45         77         53           07:00         101         60           07:15         79         94           07:30         82         70           07:45         111         74           08:00         105         78           08:15         109         73           08:30         108         85           08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:45         106         <		1		145	204			
04:30         85         70           04:45         96         84           05:00         76         74           05:15         61         61         61           05:30         68         62         62           05:45         63         67         64           06:00         75         64         64           06:15         54         48         278           06:30         72         50         66:45           06:45         77         53         70           07:15         79         94         373           07:30         82         70         70           07:45         111         74         74           08:00         105         78         78           08:15         109         73         440           08:30         108         85         85           08:45         118         99         99           09:00         102         126         70           09:15         131         110         489           09:45         148         95           10:00         102         12				127	183			
04:45         96         84           05:00         76         74           05:15         61         61         268           05:30         68         62         63         67           06:00         75         64         64         66:15         54         48         278           06:30         72         50         66:45         77         53         78         78         79         94         373	250	250	562	115	200	525	747	1,272
05:00         76         74           05:15         61         61         61           05:30         68         62         68           05:45         63         67           06:00         75         64           06:15         54         48           06:30         72         50           06:45         77         53           07:00         101         60           07:15         79         94           07:30         82         70           07:45         111         74           08:00         105         78           08:15         109         73           08:30         108         85           08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105				138	160			
05:15         61         61         268           05:30         68         62         268           05:45         63         67           06:00         75         64           06:15         54         48         278           06:30         72         50         20           06:45         77         53         373           07:00         101         60         60           07:15         79         94         373           07:30         82         70         373           07:45         111         74         373           08:00         105         78         373           08:30         108         85         440           08:30         108         85         440           08:45         118         99         99:00         102         126           09:15         131         110         489         489           09:45         148         95         10:00         102         120           10:15         122         116         432         432           10:45         106         105         11:00 </td <td></td> <td></td> <td></td> <td>129</td> <td>172</td> <td></td> <td></td> <td></td>				129	172			
05:30         68         62         268           05:45         63         67           06:00         75         64           06:15         54         48         278           06:30         72         50         06:45         77         53           07:00         101         60         0				119	219			
05:45         63         67           06:00         75         64           06:15         54         48         278           06:30         72         50         06:45         77         53           07:00         101         60         0         07:15         79         94         373           07:30         82         70         07:45         111         74         08:00         105         78         08:15         109         73         440         08:30         108         85         08:45         118         99         09:00         102         126         09:15         131         110         489         489         09:45         148         95         10:00         102         120         10:15         122         116         432         10:45         10:6         10:5         11:00         117         124         11:10         11:15         141         170         496         496	264	264	532	104	152	472	669	1,141
06:00         75         64           06:15         54         48           06:30         72         50           06:45         77         53           07:00         101         60           07:15         79         94           07:30         82         70           07:45         111         74           08:00         105         78           08:15         109         73           08:30         108         85           08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170           496         11:30         121         144				120	126			
06:15         54         48         278           06:30         72         50         66:45         77         53           07:00         101         60         70         70         70         70         70         70         70         70         70         73         70         70         73         70         72         72         72         72         72         72         72         72         72         72				129	158			
06:30         72         50           06:45         77         53           07:00         101         60           07:15         79         94           07:30         82         70           07:45         111         74           08:00         105         78           08:15         109         73           08:30         108         85           08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170           496         11:30         121         144				107	166			
06:45         77         53           07:00         101         60           07:15         79         94           07:30         82         70           07:45         111         74           08:00         105         78           08:15         109         73           08:30         108         85           08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170           496         11:30         121         144	215	215	493	91	126	419	560	979
07:00         101         60           07:15         79         94           07:30         82         70           07:45         111         74           08:00         105         78           08:15         109         73           08:30         108         85           08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170           496         11:30         121         144				92	110			
07:15         79         94         373           07:30         82         70         373           07:45         111         74         373           08:00         105         78         440           08:15         109         73         440           08:30         108         85         440           08:45         118         99         99           09:00         102         126         100           09:30         108         98         489           09:45         148         95         100         102         120           10:15         122         116         432         432           10:30         102         135         432         432           11:00         117         124         11:15         141         170         496           11:30         121         144         496         496         496         496				80	98			
07:30         82         70           07:45         111         74           08:00         105         78           08:15         109         73           08:30         108         85           08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170           496         11:30         121         144				73	88			
07:45         111         74           08:00         105         78           08:15         109         73           08:30         108         85           08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170         496           11:30         121         144         496	298	298	671	82	94	308	380	688
08:00         105         78           08:15         109         73           08:30         108         85           08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170           11:30         121         144				73	100			
08:15         109         73         440           08:30         108         85         440           08:45         118         99         99           09:00         102         126         126           09:15         131         110         489           09:30         108         98         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170           11:30         121         144				67	145			
08:30				59	98			
08:45         118         99           09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170           11:30         121         144	335	335	775	77	92	267	449	716
09:00         102         126           09:15         131         110           09:30         108         98           09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170         496           11:30         121         144         496				64	114			
09:15     131     110     489       09:30     108     98     98       09:45     148     95       10:00     102     120       10:15     122     116       10:30     102     135       10:45     106     105       11:00     117     124       11:15     141     170     496       11:30     121     144				61	94			
09:30     108     98       09:45     148     95       10:00     102     120       10:15     122     116       10:30     102     135       10:45     106     105       11:00     117     124       11:15     141     170       11:30     121     144				50	80			
09:45         148         95           10:00         102         120           10:15         122         116           10:30         102         135           10:45         106         105           11:00         117         124           11:15         141         170           11:30         121         144	429	429	918	52	78	215	352	567
10:00     102     120       10:15     122     116     432       10:30     102     135     10:45       10:45     106     105       11:00     117     124       11:15     141     170     496       11:30     121     144				52	100			
10:15     122     116     432       10:30     102     135     432       10:45     106     105       11:00     117     124       11:15     141     170     496       11:30     121     144				51	64			
10:30 102 135 432 10:45 106 105 11:00 117 124 11:15 141 170 496 11:30 121 144				41	36			
10:45     106     105       11:00     117     124       11:15     141     170       11:30     121     144	476	476	908	59	61	212	264	476
11:00 117 124 11:15 141 170 496 11:30 121 144				61	103			
11:15 141 170 496 11:30 121 144				87	93			
11:30 121 144				81	103			
	556	556	1,052	63	111	322	421	743
11.70				91	114			
Total 3,503	3,469	3 460	6,972	31	114	4,970	6,363	11,333
Daily Total 8,473	9,832		18,305			4,310	0,303	11,555

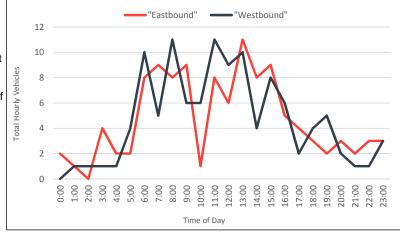


Corridor: San Antonio Airport
Master Plan

Fri

08-Jun-18

Count Location: Service Rd, West of Airport Gate #20



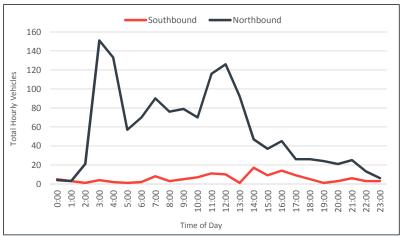
			AM					PM		
Time	Dire	ction		Hourly Totals		Dire	ction		Hourly Totals	i
	Eastbound	Westbound	Eastbound		Both Directions	Eastbound	Westbound	Eastbound	Westbound	
12:00	1	0				1	1			
12:15	0	0				3	4			
12:30	1	0	2	0	2	2	2	6	9	15
12:45	0	0				0	2			
01:00	0	1				6	2			
01:15	0	0	_	_	_	0	1			
01:30	1	0	1	1	2	1	3	11	10	21
01:45	0	0				4	4			
02:00	0	0				3	2			
02:15	0	0	_	_	_	1	1	_	_	
02:30	0	1	0	1	1	1	0	8	4	12
02:45	0	0				3	1			
03:00	3	0				0	2			
03:15	0	1				2	2			
03:30	1	0	4	1	5	4	1	9	8	17
03:45	0	0				3	3			
04:00	1	1				2	1			
04:15	1	0				0	4			
04:30	0	0	2	1	3	1	1	5	6	11
04:45	0	0				2	0			
05:00	0	0				1	1			
05:15	0	0				2	1			
05:30	1	3	2	4	6	1	0	4	2	6
05:45	1	1				0	0			
06:00	1	2				2	2			
06:15	1	6				0	0			
06:30	5	1	8	10	18	0	0	3	4	7
06:45	1	1				1	2			
07:00	3	1				0	<u></u> 1			
07:15	1	0				0	2			
07:30	3	1	9	5	14	1	2	2	5	7
07:45	2	3				1	0			
08:00	3	2				3	0			
08:15	3	4				0	2			
08:30	0	2	8	11	19	0	0	3	2	5
08:45	2	3				0	0			
09:00	1	2				1	0			
09:15	2	1	_	_		0	0	_	_	_
09:30	3	1	9	6	15	0	1	2	1	3
09:45	3	2				1	0			
10:00	0	4				1	1			
10:15	0	1		_	_	0	0	_	_	_
10:30	0	0	1	6	7	1	0	3	1	4
10:45	1	1				1	0			
11:00	2	1				0	2			
11:15	2	6	_			1	0	_		_
11:30	2	2	8	11	19	1	0	3	3	6
11:45	2	2				1	1			
Total			54	57	111	•	•	59	55	114
Daily Total			113	112	225					



Data Date: Weekday: Corridor: 08-Jun-18 Fri

Count Location:

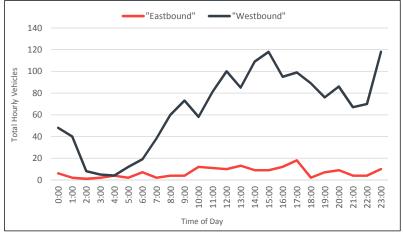
San Antonio Airport Master Plan Police Station-Employee Parking Service Rd- N. of Dee Howard Way



			AM					PM		
Time	Direc	ction		Hourly Totals		Direction Hourly Totals				
111110	Southbound				Both Directions		Northbound		Northbound	
12:00	0	1	Couribouria	Horanboana	Both Birodiono	1	32	Couribouria	Horanboana	Both Birodiono
12:15	0	0				6	31			
12:30	5	1	5	4	9	2	30	10	126	136
12:45	0	2				1	33			
01:00	3	2				0	24			
01:00	0	0				0	18			
01:30	0	1	3	3	6	0	30	1	92	93
01:45	0	0				1	20			
02:00	0	2				9	17			
02:00	0	2				1	8			
02:30	1	4	1	21	22	3	13	17	47	64
02:30	0	13				4	9			
03:00	1	22				0	9			
03:15	0	35 35	4	151	155	3	9	9	37	46
03:30										
03:45	3	59 32				3	11 11			
04:00	0					1				
04:15	0	49 29	2	133	135	4	7 11	14	45	59
04:30	-									
04:45	1	23				6	16			
05:00	0	22				5	8			
05:15	0	8	1	57	58	3	9	9	26	35
05:30	1	17				1	5			
05:45	0	10				0	4			
06:00	0	14				3	7			
06:15	1	15	2	70	72	1	4	5	26	31
06:30	0	16				1	3			
06:45	1	25				0	12			
07:00	0	11				1	6			
07:15	2	19	8	90	98	0	3	1	24	25
07:30	4	33				0	9			
07:45	2	27				0	6			
08:00	0	25				1	6			
08:15	1	16	3	76	79	0	5	3	21	24
08:30	1	23				2	6			
08:45	1	12				0	4			
09:00	2	22				0	4			
09:15	2	23	5	79	84	0	7	6	25	31
09:30	1	19				2	4			
09:45	0	15				4	10			
10:00	2	20				1	7			
10:15	4	15	7	70	77	1	2	3	13	16
10:30	0	16				0	0			
10:45	1	19				1	4			
11:00	0	21				2	2			
11:15	5	25	11	116	127	0	3	3	6	9
11:30	6	31		-		0	1		-	
11.1E	0	39				1	0			
11:45 Total			52	870	922			81	488	569

Corridor: San Antonio Airport
Master Plan

Count Location: Northern Blvd, East of US 281 NBFR



			AM					PM		
Time	Dire	ction		Hourly Totals		Dire	ction		Hourly Totals	
	Eastbound	Westbound	Eastbound		Both Directions	Eastbound	Westbound	Eastbound	Westbound	
12:00	0	12				3	23			
12:15	0	16		40	<b>5</b> 4	2	28	40	400	440
12:30	3	6	6	48	54	2	22	10	100	110
12:45	3	14				3	27			
01:00	1	5				2	20			
01:15	1	7		40	40	6	19	40	0.5	00
01:30	0	13	2	40	42	2	22	13	85	98
01:45	0	15				3	24			
02:00	1	6				1	26			
02:15	0	0				4	23		400	440
02:30	0	2	1	8	9	2	23	9	109	118
02:45	0	0				2	37			
03:00	0	1				2	37			
03:15	0	2	_	_	_	1	24	_		
03:30	2	0	2	5	7	3	18	9	118	127
03:45	0	2				3	39			
04:00	2	2				1	24			
04:15	0	0			_	3	20			
04:30	2	1	4	4	8	5	23	12	95	107
04:45	0	1				3	28			
05:00	2	3				2	25			
05:15	0	2	_			7	26			
05:30	0	2	2	12	14	4	25	18	99	117
05:45	0	5				5	23			
06:00	2	5				1	29			
06:15	0	3				1	23			
06:30	2	5	7	19	26	0	19	2	89	91
06:45	3	6				0	18			
07:00	0	6				2	19			
07:15	1	10				3	13			
07:30	1	6	2	38	40	1	22	7	76	83
07:45	0	16				1	22			
08:00	0	11				3	13			
08:15	3	12				2	25			
08:30	0	13	4	60	64	2	28	9	86	95
08:45	1	24				2	20			
09:00	1	20				3	14			
09:15	2	16				0	14			
09:30	1	24	4	73	77	0	20	4	67	71
09:45	0	13				1	19			
10:00	4	16				3	11			
10:15	4	14	40	F-0	70	0	16		70	
10:30	2	15	12	58	70	1	22	4	70	74
10:45	2	13				0	21			
11:00	2	31				4	29			
11:15	4	19				3	26			400
11:30	3	17	11	81	92	2	22	10	118	128
11:45	2	14				1	41			
Total			57	446	503			107	1,112	1,219
Daily Total			164	1,558	1,722				· ·	

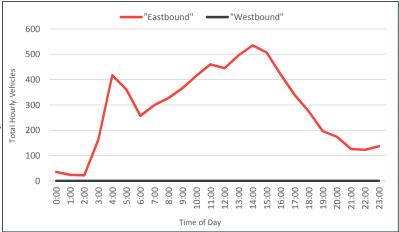
08-Jun-18

Weekday: Fri
Corridor: San Antonio Airport

Master Plan

Count Location:

E Terminal Dr, East of Parking-Terminal Split - Parking Lanes



			AM					PM			
Time	Dire	ction		Hourly Totals	,	Direction Hourly Totals					
	Eastbound	Westbound	Eastbound		Both Directions	Eastbound	Westbound	Eastbound	Westbound		
12:00	8					126					
12:15	14			_		108			_		
12:30	10		36	0	36	104		445	0	445	
12:45	4					107					
01:00	5					122					
01:15	9					115					
01:30	3		24	0	24	129		496	0	496	
01:45	7					130					
02:00	4					129					
02:15	2					145					
02:30	5		22	0	22	123		535	0	535	
02:45	11					138					
03:00	23					140					
03:00	32					130					
03:30	48		163	0	163	120		507	0	507	
03:45	60					117					
04:00	78					117					
04:00	124					110					
04.15	112		417	0	417	110		420	0	420	
						83					
04:45	103 112					106					
05:00											
05:15	86		361	0	361	74		339	0	339	
05:30	88					91					
05:45	75					68					
06:00	69					82					
06:15	67		257	0	257	57		274	0	274	
06:30	51					70					
06:45	70					65					
07:00	78					58					
07:15	70		299	0	299	43		196	0	196	
07:30	81					49					
07:45	70					46					
08:00	80					51					
08:15	91		327	0	327	46		174	0	174	
08:30	75					43					
08:45	81					34					
09:00	94					24					
09:15	84		366	0	366	35		126	0	126	
09:30	102					32					
09:45	86					35					
10:00	121					26					
10:15	101		416	0	416	37		123	0	123	
10:30	113		-			26			-		
10:45	81					34					
11:00	102					33					
11:15	120		460	0	460	36		137	0	137	
11:30	114			Ŭ		32			ŭ		
11:45	124					36					
Total			3,148	0	3,148			3,772	0	3,772	
Daily Total			6,920	0	6,920						

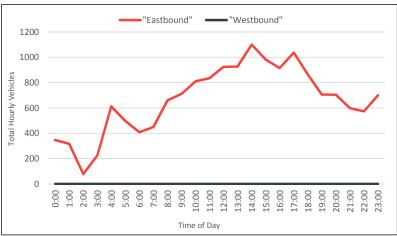
08-Jun-18 Fri

Corridor:

San Antonio Airport Master Plan

Count Location:

E Terminal Dr, East of Parking-Terminal Split - Terminal Lanes



			AM					PM		
Time	Dire	ction		Hourly Totals		Direction Hourly Totals				
	Eastbound	Westbound	Eastbound		Both Directions	Eastbound	Westbound	Eastbound	Westbound	
12:00	125					236				
12:15	116					231				
12:30	40		347	0	347	212		924	0	924
12:45	66					245				
01:00	87					233				
01:15	61					199				
01:30	69		317	0	317	254		927	0	927
01:45	100					241				
02:00	32					258				
02:15	17					288				
02:30	11		78	0	78	279		1,100	0	1,100
02:45	18					275				
03:00	19					282				
03:15	49					193				
03:30	57		225	0	225	295		982	0	982
03:45	100					212				
04:00	138					242				
04:00	147					231				
04:30	172		612	0	612	198		914	0	914
04:45	155					243				
05:00	165					285				
05:00	113					218				
05:30	123		497	0	497	251		1,037	0	1,037
05:45	96					283				
06:00	101					267				
06:00	91					227				
06:30	88		407	0	407	197		864	0	864
06:45	127					173				
07:00	120					149				
07:15	85					154				
07:30	119		449	0	449	211		706	0	706
07:45	125					192				
08:00	133					209				
08:00	163					182				
08:30	153		659	0	659	181		704	0	704
08:45	210					132				
09:00	151					148				
09:00	145					176				
09:30	201		711	0	711	153		598	0	598
09:45	214					121				
10:00	200					86				
10:15	231					127				
10:30	161		811	0	811	169		573	0	573
10:45	219					191				
11:00	278					231				
11:15	177					184				
11:30	186		834	0	834	128		699	0	699
11:45	193					156				
Total	133		5,947	0	5,947	100		10,028	0	10,028
			3,341	v	3,341			10,020	U	10,020



Data Date: Weekday: Corridor:

Count Location:

08-Jun-18 Fri

San Antonio Airport Master Plan Entrance to CONRAC Facility

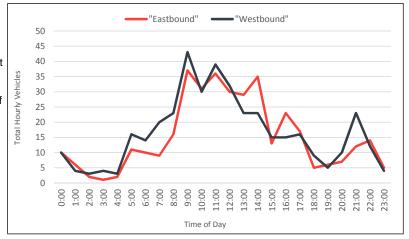


Time of Day

		AM					PM		
Time	Direction		Hourly Totals		Direc	ction		Hourly Totals	i
		Southbound		Both Directions	Southbound				Both Directions
12:00	2		-			93			
12:15	8	0	4.4	4.4		68		040	040
12:30	4	0	14	14		74	0	313	313
12:45	0					78			
01:00	2					83			
01:15	1	0	4	4		75	0	204	204
01:30	0	0	4	4		80	0	321	321
01:45	1					83			
02:00	1					95			
02:15	3	0	40	40		73		000	000
02:30	1	0	10	10		73	0	332	332
02:45	5					91			
03:00	4					87			
03:15	6					80		000	
03:30	21	0	66	66		68	0	302	302
03:45	35					67			
04:00	35					58			
04:15	50	0	404	404		68		00.4	00.4
04:30	48	0	191	191		59	0	234	234
04:45	58					49			
05:00	49					50			
05:15	40	0	400	400		22	0	444	444
05:30	40	0	168	168		44	U	144	144
05:45	39					28			
06:00	43					41			
06:15	36	0	148	148		33	0	138	138
06:30	24	U	140	140		32	U	130	130
06:45	45					32			
07:00	43					29			
07:15	38	0	167	167		19	0	80	80
07:30	45	U	107	107		20	U	80	80
07:45	41					12			
08:00	39					13		-	
08:15	47	0	188	188		13	0	57	57
08:30	56		100	100		14		31	3,
08:45	46					17			
09:00	53	]				14			
09:15	50	0	214	214		11	0	56	56
09:30	62		217	217		16		30	30
09:45	49					15			
10:00	65	]				8			
10:15	55	0	268	268		10	0	27	27
10:30	69	]	_50	_50		4			
10:45	79					5			
11:00	66	]				2			
11:15	79	0	302	302		2	0	9	9
11:30	76	]	002	002		2			Ĭ
11:45	81					3			
Total		0	1,740	1,740			0	2,013	2,013
Daily Total		0	3,753	3,753					

Corridor: San Antonio Airport
Master Plan

Count Location: Driveway in front of Police Station



			AM					PM		
Time	Dire	ction	Hourly Totals		Direction Hourly Totals					
Tillie	Eastbound	Westbound	Eastbound	Westbound		Eastbound	Westbound	Eastbound	Westbound	
12:00	2	2	Lastboaria	Westboard	Both Bircctions	15	9	Lasibouria	VVCStbound	Both Bircctions
12:15	2	0				7	6			
12:30	0	6	10	10	20	5	9	30	32	62
12:45	6	2				3	8			
01:00	1	2				17	9			
01:00	5	2				4	7			
01:30	0	0	6	4	10	3	3	29	23	52
01:45	0	0				5	4			
02:00	1	2				16	13			
02:00	1	1				6	3			
02:15	0	0	2	3	5	6	1	35	23	58
02:30	0	0				7	6			
03:00	0	0				1	3			
03:00	1	3				2	1			
03:30	0	1	1	4	5	2	5	13	15	28
	0	0				8				
03:45 04:00	0	0				8	<u>6</u> 4			
04:00	2	0			5	3	3		15	
04.15	0	3	2	3		7	7	23		38
04.30	0	0				5	1			
05:00	2	4		-		8	4			
05:00	1	2		16	27	3	4		16	
05.15	6	6	11			2	4	17		33
	2	4				4	4			
05:45 06:00	5	4				2	4			
06:00	1	3		14	24	2	1		9	
06:30	2	4	10			0	0	5		14
06:45	2	3				1	4			
06.45	3	5				0	0			
07:00	0	0			29	1	1		5	
07:15	4	7	9	20		3	3	6		11
07:45	2	8				2	3 1			
08:00	2	3				3	1			
08:00	7	8				3	3			
08:30	4	6	16	23	39	1	3 1	7	10	17
08:45	3	6				0	5			1
09:00	11	8				3	6			<del>                                     </del>
09:00	8	13				2	5			
09:15	6	9	37	43	80	2	6	12	23	35
09:45	12	13				5	6			1
10:00	10	8				1	1			
10:00	7	6				6	4			
10:15	8	7	31	30	61	3	2	14	12	26
10:45	6	9				4	5			
11:00	10	10				2	2			+
11:15	7	7				1	2			
11:30	13	13	36	39	75	1	0	5	4	9
11:45	6	9				1	0			
Total	U	3	171	209	380		J	196	187	383
Daily Total			367	396	763			130	101	303



Data Date: Weekday: Corridor:

08-Jun-18 Fri

San Antonio Airport Master Plan Count Location: Airport Blvd,

Between Loop 410 WBFR & Northern



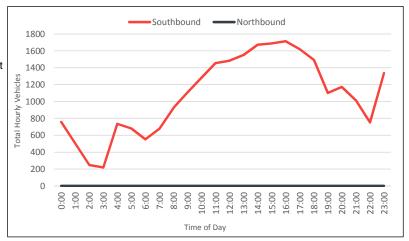
			AM					PM		
Time	Direc	ction		Hourly Totals		Dire	ction		Hourly Totals	1
	Southbound		Southbound		Both Directions		Northbound	Southbound		
12:00	150	60				232	256			
12:15	136	80	400	007	007	212	249	000	000	4.074
12:30	56	51	400	237	637	211	248	882	992	1,874
12:45	58	46				227	239			
01:00	60	43				231	240			
01:15	64	44	000	474	440	232	233	0.40	4 000	4.054
01:30	39	35	269	174	443	171	269	848	1,006	1,854
01:45	106	52				214	264			
02:00	79	20				270	262			
02:15	28	15				224	288			
02:30	15	18	137	97	234	267	277	995	1,099	2,094
02:45	15	44				234	272			
03:00	20	57				264	275			
03:15	27	95				245	231			
03:30	36	129	147	439	586	212	286	966	1,053	2,019
03:45	64	158				245	261			
04:00	90	208			1,272	288	217			
04:15	99	215				223	237			1,900
04:30	126	188	433	839		243	259	983	917	
04:45	118	228				229	204			
05:00	123	198		671	1,068	255	257		927	
05:15	95	164	397			226	226			
05:30	93	171				194	243	876		1,803
05:45	86	138				201	201			
06:00	84	145		558	914	237	194		656	
06:15	91	121	0.50			254	145			4 = 40
06:30	77	151	356			159	169	860		1,516
06:45	104	141				210	148			
07:00	127	170			1,192	131	141		593	
07:15	122	186	400	724		142	131	000		4 000
07:30	111	188	468			145	138	636		1,229
07:45	108	180				218	183			
08:00	142	194				161	148		500	
08:15	158	200	604	700	4.400	157	128	000		<b></b> .
08:30	143	193	624	782	1,406	171	114	606	508	1,114
08:45	181	195				117	118			
09:00	168	193				130	103			
09:15	154	187	658	763	1,421	147	125	594	481	1,075
09:30	168	187	გვე	103	1,421	156	122	594	461	1,075
09:45	168	196				161	131			
10:00	163	245				93	110			
10:15	192	203	739	881	1 620	89	120	410	486	896
10:30	196	214	138	001	1,620	104	109	410	400	090
10:45	188	219				124	147			
11:00	240	232				156	144			
11:15	258	247	027	000	1,925	188	162	700	526	1,226
11:30	232	261	931	937 988	1,925	150	119	700	520	1,220
11:45	207	248				206	101			
Total			5,565	7,153	12,718			9,356	9,244	18,600
Daily Total		· · · · · · · · · · · · · · · · · · ·	14,921	16,397	31,318	· · · · · ·	· · · · · · ·	· · ·	· · · · · · ·	



Data Date: Weekday: Corridor: 08-Jun-18

Count Location:

San Antonio Airport Master Plan W. Terminal Dr. North of Dee Howard Way

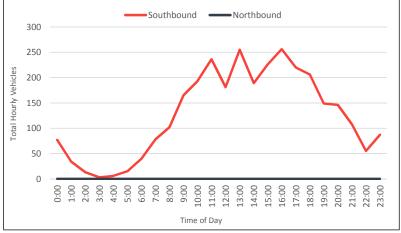


		AM				PM		
Time	Direction		Hourly Totals		Direction		Hourly Totals	i
	Southbound Northbound	Southbound	Northbound	Both Directions	Southbound Northbound	Southbound	Northbound	Both Directions
12:00	289				363			
12:15	262	757		757	386	4 400		4 400
12:30	112	757	0	757	352	1,483	0	1,483
12:45	94				382			
01:00	107				401			
01:15	136	500	0	500	423	4.550	0	4.550
01:30	83	503	0	503	320	1,552	0	1,552
01:45	177				408			
02:00	135				405			
02:15	47	248	0	248	417	4.070	0	4.070
02:30	29	248	U	248	422	1,673	U	1,673
02:45	37				429			
03:00	33				458			
03:15	37	040	0	04.0	416	4.000		4.000
03:30	57	218	0	218	372	1,688	0	1,688
03:45	91				442			
04:00	140				467			1,713
04:15	175	705		735	483	4 740		
04:30	214	735	0		400	1,713	0	
04:45	206				363			
05:00	202		0	680	435	1,619	0	1,619
05:15	182	000			454			
05:30	159	680			342			
05:45	137				388			
06:00	136		0	551	410	1,493	0	1,493
06:15	134	554			414			
06:30	126	551			322			
06:45	155				347			
07:00	184				258			
07:15	179	070	0	676	234	1,101	0	1,101
07:30	145	676			264			
07:45	168				345			
08:00	185				329			
08:15	230	923	0	923	294	1,173	0	1,173
08:30	210	323	U	923	327	1,173	U	1,173
08:45	298				223			
09:00	284			_	249			
09:15	256	1,105	0	1,105	228	1,013	0	1,013
09:30	260	1,105	U	1,105	276	1,013	U	1,013
09:45	305				260			
10:00	291			_	149			
10:15	343	1,282	0	1,282	134	751	0	751
10:30	356	1,202	U	1,202	215	/51	U	751
10:45	292				253			
11:00	391				312			
11:15	410	1,455	0	1,455	355	1,335	n	1,335
11:30	345	1,400	U	1,400	302	1,333	0	
11:45	309				366			
Total		9,133	0	9,133		16,594	0	16,594
Daily Total		25,727	0	25,727			-	



Corridor: San Antonio Airport
Master Plan
Count Location: CONRAC Facility

Count Location: CONRAC Facility
Access, South of
Terminal Pickup



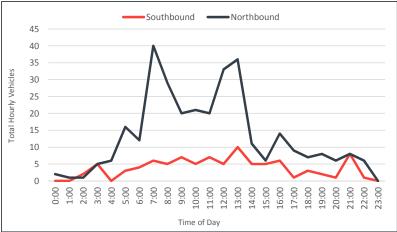
		AM					PM		
Time	Direction		Hourly Totals		Dire	ction		Hourly Totals	
	Southbound Northbound			Both Directions		Northbound			Both Directions
12:00	29				49				
12:15	23				48		404		404
12:30	20	77	0	77	36		181	0	181
12:45	5				48				
01:00	13				57				
01:15	7				74				
01:30	4	34	0	34	64		255	0	255
01:45	10				60				
02:00	7				55				
02:15	4				37				
02:30	1	13	0	13	41		189	0	189
02:45	1				56				
03:00	3				57				
03:00	0				63				
03:30	0	3	0	3	53		226	0	226
03:30	0				53				
	0				66				
04:00 04:15	2			6	73				
	1	6	0				256	0	256
04:30					63				
04:45	3				54				
05:00	2			15	63			0	
05:15	3	15	0		53		220		220
05:30	6				53				
05:45	4		1		51				
06:00	6		0	40	48			0	
06:15	8	40			49		206		206
06:30	5				60				
06:45	21				49				
07:00	20				49				
07:15	24	78	0	78	38		149	0	149
07:30	23	, ,	Ü		26				
07:45	11				36				
08:00	25				31				
08:15	31	102	0	102	32		146	0	146
08:30	23	102	J	102	46		140	J	140
08:45	23				37				
09:00	46				25				
09:15	35	165	0	165	27		108	0	108
09:30	35	100	U	100	27		100	U	100
09:45	49				29				
10:00	44				10				
10:15	49	102	0	102	10		55	0	FF
10:30	46	193	0	193	16		55	0	55
10:45	54				19				
11:00	49				22				
11:15	66				21				
11:30	67	236	0	236	26		87	0	87
11:45	54				18				
Total		962	0	962			2,078	0	2,078
Daily Total		3,040	0	3,040			_,,,,		_,



Data Date: Weekday: Corridor: 08-Jun-18 Fri

Corridor: San Antonio Airport
Master Plan
Count Location: Police StationEmployee Parking

Employee Parking Service Rd. S. of Police Station Dwy.



	AM					PM					
Time	Diro	ction	Hourly Totals		Direction Hourly Totals						
Tille					Both Directions					Both Directions	
12:00	0	0	Southbound	Northbourid	Both Directions	0	12	Southbound	Northbourid	Botti Directions	
12:15	0	0				1	4				
12:30	0	0	0	2	2	3	5	5	33	38	
12:45	0	2				1	12				
01:00	0	1				0	4				
01:15	0	0				4	17				
01:30	0	0	0	1	1	3	10	10	36	46	
01:45	0	0				3	5				
02:00	1	1				3	3				
02:15	0	0				1	3				
02:30	0	0	2	1	3	1	4	5	11	16	
02:45	1	0				0	1				
03:00	1	0				1	0				
03:15	1	2	_	_		2	2	_			
03:30	2	1	5	5	10	2	4	5	6	11	
03:45	1	2				0	0				
04:00	0	0			6	1	1			20	
04:15	0	0				1	0				
04:30	0	2	0	6		3	13	6	14		
04:45	0	4				1	0				
05:00	0	0		16	19	0	4	1	9		
05:15	2	6				1	5			10	
05:30	0	3	3			0	0				
05:45	1	7				0	0				
06:00	0	1		12	16	1	5	3	7		
06:15	0	4	4			2	2			10	
06:30	0	0	7	12		0	0			10	
06:45	4	7				0	0				
07:00	0	4			46	1	0	2	8		
07:15	1	13	6	40		0	1			10	
07:30	2	13		40		1	3	_			
07:45	3	10				0	4				
08:00	1	9				1	3				
08:15	0	7	5	29	34	0	0	1	6	7	
08:30	2	4	Ĭ			0	0				
08:45	2	9				0	3				
09:00	2	4				0	0				
09:15	4	7	7	20	27	2	3	8	8	16	
09:30	0	6		-		4	2				
09:45	1	3				2	3				
10:00	1	5				0	0				
10:15	2	5	5	21	26	0	1	1	6	7	
10:30	1	6	Ŭ			1	3				
10:45	1	5				0	2				
11:00	2	0				0	0				
11:15	3	7	7	20	27	0	0	0	0	0	
11:30	2	7	. 20			0	0		Ĭ		
11:45	0	6	44	470	047	0	0	47	444	101	
Total			44	173	217			47	144	191	
Daily Total			91	317	408						

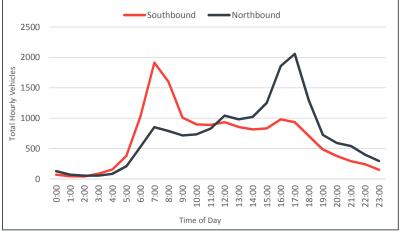
## Field Data Collection 24 Hour Tube Counts



Data Date: 12-Jun-18 Weekday: Tue

Corridor: San Antonio Airport
Master Plan
Count Location: Waters Pd. Count

Count Location: Wetmore Rd, South of Wurzbach Pkwy



Time				AM			ı		PM		
	Time	Dire	ction								
12:00	Tillio									•	
12:15	12:00			Couribouria	Horanboana	Both Birodiono			Couribound	rtortribouria	Dotti Diroctiono
12.30				71							
124.54					127	198			934	1,041	1,975
01:00											
01:15											
01:30		_									
01:45				44	69	113			854	980	1,834
C2:00   6											
O2:15											
02:30		-									
02:45				41	55	96			816	1,020	1,836
03:00											
03:15											
03:30							_				
03.45				85	54	139			831	1,250	2,081
04:00											
04:15         35         18         154         82         236         234         472         980         1,858         2,838           04:30         45         17         17         219         453         219         453         219         453         219         453         219         453         219         453         262         479         933         2,057         2,990         2,990         05:30         109         66         49         377         206         583         262         479         933         2,057         2,990         2,990         05:30         109         66         49         377         206         583         262         479         933         2,057         2,990         2,990         05:36         572         933         2,057         2,990         2,990         05:36         178         499         06:45         178         499         06:45         178         499         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,995         1,											
04:30											
04:45         45         37         219         453         257         507         22         557         22         257         507         257         257         507         257         507         257         507         257         507         257         507         258         257         257         258         257				154	82	236			980	1,858	2,838
O5:00											
05:15         66         49         377         206         583         262         479         933         2,057         2,990           05:30         109         65         377         206         583         262         479         933         2,057         2,990           05:45         145         70         178         499         178         499         178         499         178         178         499         178         178         178         499         178         178         499         178         1											
05:30					206	583	-			2,057	
178   499   178   499   178   499   178   499   178   499   178   499   178   499   178   178   499   178				377					933		2,990
06:00         157         95           06:15         217         102         1,028         527         1,555         172         380         706         1,289         1,995           06:30         282         129         1,028         527         1,555         177         281         706         1,289         1,995           06:45         372         201         152         265         265         265         262         1,912         853         2,765         132         166         485         726         1,211           07:30         550         262         1,912         853         2,765         132         166         485         726         1,211           07:45         505         227         98         155         98         155         159         98         155         159         98         155         166         485         726         1,211											
06:15         217         102         1,028         527         1,555         172         380         706         1,289         1,995           06:30         282         129         1,028         527         1,555         177         281         706         1,289         1,995           06:45         372         201         152         265         152         265         152         265         152         152         265         152         152         265         152         152         265         153         2765         132         166         485         726         1,211         155         158         155         155         155         155         155         156         156         156         156         156         156         156 <td></td>											
06:30         282         129         1,028         527         1,555         177         281         706         1,289         1,995           06:45         372         201         152         265         265         265         265         27         27         152         265         221         265         221         27         281         221         266         221         2853         2,765         138         221         21         221         27         281         27         281         283         221         2853         27         281         283         221         2853         27         281         283         283         283         283         283         283         283         283         283         283         283         283         283         283         383					527	1,555				1,289	
06:45   372   201   152   265				1,028					706		1,995
07:00         401         202           07:15         456         162         1,912         853         2,765         132         166         485         726         1,211           07:30         550         262         1,912         853         2,765         117         184         485         726         1,211           08:00         429         220         103         164         164         167         168         164         167         164         167         164         167         164         167         164         167         164         167         164         167         164         167         164         167         168         164         167         168         164											
07:15         456         162         1,912         853         2,765         132         166         485         726         1,211           07:30         550         262         1,912         853         2,765         132         166         485         726         1,211           07:45         505         227         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         168         164         485         726         1111         1111         103         164         1112         1112         1111 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td rowspan="4">726</td><td></td></td<>										726	
07:30         550         262         1,912         853         2,765         117         184         485         726         1,211           08:00         429         220         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         99         965         98         155         99         965         966         966         966         966         966         966         966         966         966 <td< td=""><td></td><td>-</td><td></td><td></td><td></td><td rowspan="3">2,765</td><td></td><td></td><td></td><td></td></td<>		-				2,765					
07:45         505         227         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         155         98         103         164         98         164         98         155         98         103         164         98         103         164         98         103         164         98         103         102         103         164         98         164         98         103         102         103         164         98         103         103         104         103         104         102         157         102         157         102         157         102         157         102         157         103				1,912	853				485		1,211
08:00         429         220           08:15         388         195         1,598         788         2,386         83         132         375         590         965           08:30         412         167         167         102         157         137         137         137         137         143         292         541         833         132         375         590         965         966         93         965         966											
08:15         388         195         1,598         788         2,386         83         132         375         590         965           08:30         412         167         1,598         788         2,386         83         132         375         590         965           08:45         369         206         102         157         102         157         102         157         102         157         102         157         102         157         102         157         103         143         292         541         833         833         132         375         590         965         965         965         102         143         143         292         541         833         833         132         143         292         541         833         132         143         143         292         541         833         133         143         292         541         833         133         143         292         541         833         133         143         292         541         833         152         866         112         1162         1162         1162         1162         1162         1162         1162											
08:30       412       167       1,598       788       2,386       87       137       375       590       965         08:45       369       206       102       157       102       157       102       157       102       157       102       157       102       157       102       157       103       143       292       541       833       833       109:15       271       190       109       143       109       143       109       143       292       541       833       833       66       130       100       100       100       100       138       100       66       112       100											
08:45         369         206         102         157         900         157         900 </td <td></td> <td></td> <td></td> <td>1,598</td> <td>788</td> <td>2,386</td> <td></td> <td></td> <td>375</td> <td>590</td> <td>965</td>				1,598	788	2,386			375	590	965
09:00         267         189           09:15         271         190           09:30         261         168           09:45         208         167           10:00         190         138           10:15         209         194           10:30         244         185           10:45         254         215           11:00         202         216           11:15         223         152           11:30         205         226           11:45         259         231           Total         8,103         5,032         13,135           68         161         143           292         541         833           86         130         292           541         833           665         107           66         91           42         96           40         86           40         86           40         86           40         86           41:40         76           441         76           45         25           56											
09:15         271         190         1,007         714         1,721         73         143         292         541         833           09:30         261         168         168         1,007         714         1,721         73         143         292         541         833           09:45         208         167         66         107         100         100         138         665         107         100         100         100         112         66         112         100         1											
09:30         261         168         1,007         714         1,721         86         130         292         541         833           09:45         208         167         65         107         100         100         138         665         107         100         100         138         666         112         100											
09:45         208         167         65         107           10:00         190         138         66         112           10:15         209         194         897         68         99         242         398         640           10:30         244         185         42         96         42         96         42         96         42         96         42         96         42         42         96         42         42         96         42         42         42         77         148         295         443         42         77         441         76         443         443         443         443         443         444         76         443         443         443         444         76         444         444         76         444         444         76         444				1,007	714	1,721			292	541	833
10:00     190     138       10:15     209     194       10:30     244     185       10:45     254     215       11:00     202     216       11:15     223     152       11:30     205     226       11:45     259     231       Total     8,103     5,032     13,135       66     112       68     99       68     99       42     96       42     96       42     77       44     76       41     76       25     56       7,596     12,045     19,641											
10:15     209     194     897     732     1,629     68     99     242     398     640       10:30     244     185     42     96     242     398     640       10:45     254     215     42     96     242     398     640       11:00     202     216     42     96     40     86     40     86     42     77     42     77     41     76     41     76     41     76     41     76     42     77     75 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>											
10:30     244     185     897     732     1,629     66     91     242     398     640       10:45     254     215     42     96											
10:45         254         215         42         96 <t< td=""><td></td><td></td><td></td><td>897</td><td>732</td><td>1,629</td><td></td><td></td><td>242</td><td>398</td><td>640</td></t<>				897	732	1,629			242	398	640
11:00     202     216       11:15     223     152       11:30     205     226       11:45     259     231       Total     8,103     5,032     13,135       40     86       42     77       41     76       25     56       7,596     12,045     19,641											
11:15     223     152     889     825     1,714     42     77     148     295     443       11:45     259     231     25     56     56     7,596     12,045     19,641											
11:30											
11:45         259         231         25         56         56         12,045         19,641           Total         8,103         5,032         13,135         7,596         12,045         19,641				889	889 825	1,714			148	295	443
Total 8,103 5,032 13,135 7,596 12,045 19,641											
·		233	201	8 103	5 032	13 135	25	30	7 596	12 045	19 641
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Daily Total			15,699	17,077	32,776			1,550	12,043	13,041

## San Antonio Airport System Strategic Development Plan

### 2021 AIRPORT MASTER PLAN

MASTER PLAN UPDATE
CHAPTER 2 – INVENTORY OF EXISTING CONDITIONS
APPENDIX 2E – PRIMARY RUNWAY WIND ROSES







## ALL-WEATHER WIND ROSES

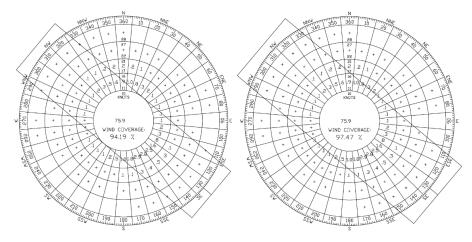


Figure 2E-1 | 10.5 knots - All-Weather Figure F-2 | 13 knots - All-Weather

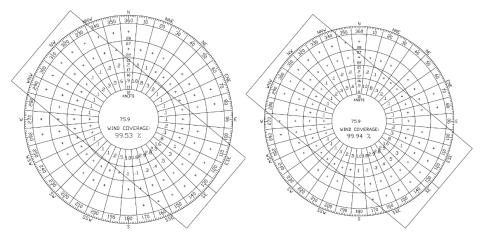


Figure 2E-3 | 16 knots – All-Weather Figure F-4 | 20 knots – All-Weather

Table 2E-1 | Wind Coverage (All-Weather) for Runways 13R-31L and 13L-31R

10.5 knots	94.19%
13 knots	97.47%
16 knots	99.53%
20 knots	99.94%

Source: NOAA National Climatic Data Center (NCDC)



#### IFR WIND ROSES

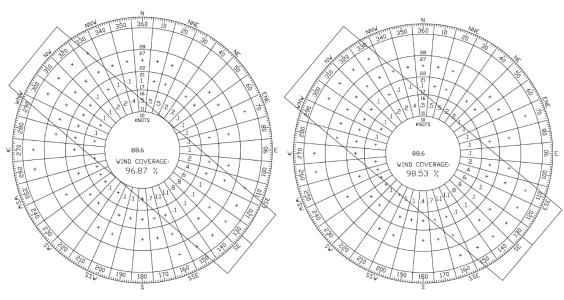


Figure 2E-5 | 10.5 knots - IFR

Figure 2E-6 | 13 knots - IFR

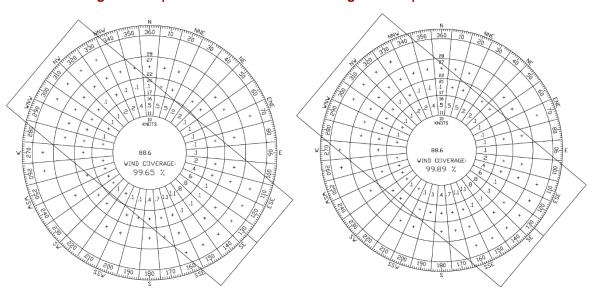


Figure 2E-7 | 16 knots – IFR

Figure 2E-8 | 20 knots - IFR

Table 2E-2 | Wind Coverage (IFR) for Runways 13R-31L and 13L-31R

10.5 knots	96.87%
13 knots	98.53%
16 knots	99.65%
20 knots	99.89%

Source: NOAA National Climatic Data Center



#### VFR WIND ROSES

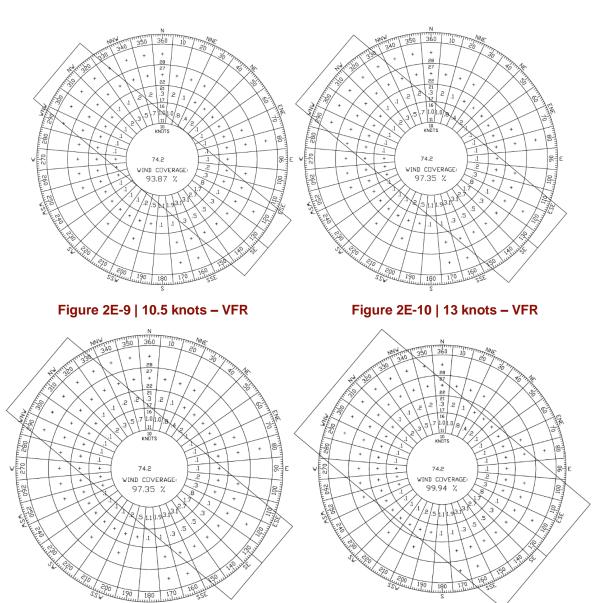


Figure 2E-11 | 16 knots – VFR

Figure 2E-12 | 20 knots - VFR

Table F-3 | Wind Coverage (VFR) for Runways 13R-31L and 13L-31R

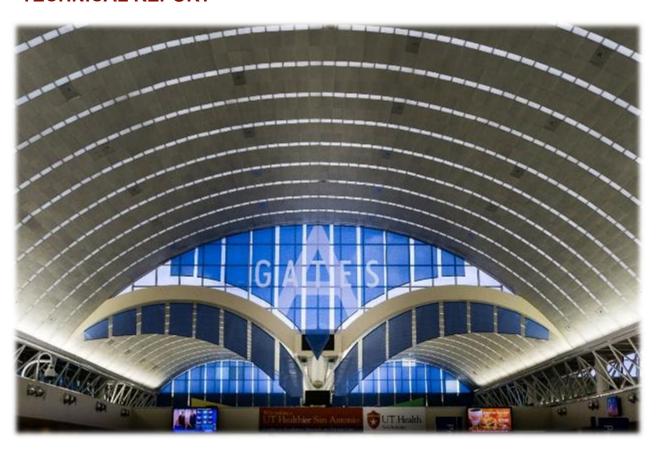
10.5 knots	96.87%
13 knots	98.53%
16 knots	99.65%
20 knots	99.89%

Source: NOAA National Climatic Data Center

## San Antonio Airport System Strategic Development Plan

## 2021 AIRPORT MASTER PLAN

MASTER PLAN UPDATE CHAPTER 2 – INVENTORY OF EXISTING CONDITIONS APPENDIX 2F – ENVIRONMENTAL INVENTORY TECHNICAL REPORT







# **Environmental Inventory Technical Report Airport Master Plan Scope of Services: Phase 1**

Prepared for: San Antonio International Airport

Prepared by: Poznecki-Camarillo, Inc.

Airport Development & Strategic Planning Services Project (WSP #28445A)

Bexar County, Texas

July 2018

# **Table of Contents**

1	Introduction1	
2	Methodology	2
3	Existing Conditions	6
3.1	Air Quality6	
	3.1.1 General Conformity7	
	3.1.2 Hazardous Air Pollutants8	
	3.1.3 Greenhouse Gases8	
	3.1.4 City Ordinance #2015-11-19-09678	
	3.1.5 Aviation Environmental Design Tool	
3.2	Aquatic Resources9	
	3.2.1 Clean Water Act Section 4049	
	3.2.2 Clean Water Act Section 40113	
	3.2.3 Executive Order 11990 Wetlands13	
	3.2.4 Clean Water Act Section 303(d)13	
	3.2.5 Clean Water Act Section 40215	
	3.2.6 Floodplains17	
	3.2.7 Edwards Aquifer17	
	3.2.8 Other Federal Regulations19	
3.3	Hazardous Materials and Soils20	
	3.3.1 Hazardous Materials20	
	3.3.2 Soils27	
	3.3.3 Farmlands31	
3.4	Biological Resources35	
	3.4.1 Vegetation35	
	3.4.2 Wildlife39	
	3.4.3 Threatened and Endangered Species42	
3.5	Socioeconomic Conditions and Demographics67	
	3.5.1 Regional Growth68	
	3.5.2 Environmental Justice Populations69	
	3.5.3 Limited-English Proficiency Populations74	
	3.5.4 Children's Environmental Health and Safety Risks 76	
3.6	Community Resources76	
	3.6.1 Schools77	
	3.6.2 Places of Worship78	
	3.6.3 Other Community Facilities79	
	3.6.4 Parks and Recreation Areas81	
	3.6.5 Ports of Entry82	

3.7	Cultu	ral Resources	82
		3.7.1 Archaeological Resources	
		3.7.2 Cemeteries	
		3.7.3 Historic Resources	
		3.7.4 Tribal Consultation	
3.8	Section	on 4(f), Section 6(f), and Chapter 26 Properties	
		3.8.1 Section 4(f) Properties	
		3.8.2 Section 6(f) Properties	
		3.8.3 Chapter 26 Properties	
3.9	Noise	Sensitive Land Uses/Receptors	91
4	Summary	96	
5	References	99	
Figu	ures		
Figur	e 1: Bounda	ries of the Study Area	2
		neds of the Study Area	
Figur	e 3: Water R	lesources of the Study Area	11
Figur	e 4: Threate	ned and Impaired Waters near the Study Area	15
_		s Aquifer Zones within the Study Area	
Figur	e 6: Municip	oal Solid Waste Facilities near the Study Area	25
_		p of the Study Area	
_		d Soils within the Study Area	
_		ed Area of the Study Area	
_		ed EMST Types of the Study Area	
_		Zones of the Study Area	
_		I Habitat Units within Proximity to the Study Area	
_		J.S. Census Geographies	
		nal Population Growth of Bexar County, 2010-2070	
_		ty Populations of the Study Area	
		unity Resources in the Vicinity of the Study Area	
_		ial Archaeological Liability Map of the Study Area	
_		t Noise Sensitive Land Uses/Receptors	
Figur	e 19: Future	Noise Sensitive Land Uses/Receptors	94
Tab			2010
		nental Inventory On-Line Data Sources (Accessed July	
		ed and Impaired Waters within Five Miles Upstream o	-
Table	e 3: FEMA Flo	ood Zones within the Study Area	17

Table 4: Hazardous Materials Regulatory Database Summary within 0.5-Mile	of
the Study Area	. 20
Table 5: Solid Waste Facilities within the Study Area	. 24
Table 6: Soil Map Units within the Study Area	. 28
Table 7: Farmland Soils within the Study Area	. 33
Table 8: Mapped EMST Vegetation Types of the Study Area	. 37
Table 9: Migratory Bird Species in the Study Area	.40
Table 10: Threatened, Endangered, Candidate, SGCN, and Rare Species	of
Occurrence in the Study Area	. 42
Table 11: Elements of Occurrence within 1.5 Miles of the Study Area	. 61
Table 12: Racial and Ethnic Composition of the Study Area	.70
Table 13: Median Household Income of the Study Area	.74
Table 14: Persons who Speak English "Less than Very Well" in the Study Area	. 75
Table 15: Schools within One Mile of the Study Area	. 77
Table 16: Places of Worship within One Mile of the Study Area	. 78
Table 17: Community Facilities within One Mile of the Study Area	. 80
Table 18: Parks and Recreational Facilities within One Mile of the Study Area	. 82
Table 19: Land Use Compatibility per Average Sound Levels	. 95
Table 20: Environmental Constraints of the Study Area	. 98

# **Acronyms and Abbreviations**

AAMPO Alamo Area Metropolitan Planning Organization

AC Advisory Circular

ACHP Advisory Council on Historic Preservation

ACS American Community Survey

ACT Antiquities Code of Texas

AEDT Aviation Environmental Design Tool

ALP Airport Layout Plan

APE Area of Potential Effects

AQHAP Air Quality Health Alert Plan

Atlas Texas Archaeological Sites Atlas

BG Block Groups

BGEPA Bald and Golden Eagle Protection Act

**BMPs Best Management Practices** 

CAA Clean Air Act

CAAA Clean Air Act Amendments

CEQ Council on Environmental Quality

CFR Code of Federal Regulations

CGP Contruction General Permit

CO Carbon Monoxide

CoSA City of San Antonio

CT Census Tracts

CWA Clean Water Act

dB Decibel

dBA A-weighted decibel

DNL Day-Night Average Sound Level

DOI U.S. Department of Interior

DOJ U.S. Department of Justice

DOT U.S. Department of Transportation

**EA** Environmental Assessment

EACZ Edwards Aquifer Contributing Zone

EARZ Edwards Aquifer Recharge Zone

EIS Environmental Impact Statement

EMST Ecological Mapping System of Texas

EO Executive Order

EPA U.S. Environmental Protection Agency

ESA Endangered Species Act

FAA Federal Aviation Administration

FEMA Federal Emergency Management Agency

FHWAFederal Highway Administration

FPPA Farmland Protection Policy Act

FTA Federal Transit Adminsitration

FWCA Fish and Wildlife Coordination Act

GIS Geographic Information System

HAPs Hazardous Air Pollutants

HHS U.S. Department of Health and Human Services

IBWC International Boundary and Water Commission

IP Individual Permit

ISD Independent School District

LEP Limited-English Proficiency

LPST Leaking Petroleum Storage Tank

LWCF Land and Water Conservation Fund Act

MBTA Migratory Bird Treaty Act

MOA Memorandum of Agreement

MS4 Municipal Separate Storm Sewer System

MSGP Multi-Sector General Permit

MSW Municipal Solid Waste

NAAQS National Ambient Air Quality Standards

NCP Noise Compatability Program

NEM Noise Exposure Map

NEPA National Environmental Policy Act

NHPA National Historic Preservation Act

NO2 Nitrogen Dioxide

NOI Notice of Intent

NPS National Park Service

NPDES National Pollutant Discharge Elimination System

NRCS Natural Resources Conservation Service

NRHP National Register of Historic Places

NWP Nationwide Permit

O3 Ozone

OG Organic Gas

OWJ Officials with Jurisdiction

PALM Potential Archaeological Liability Map

P.E. Professional Engineer

Pb Lead

PM Particulate Matter

POE Port-of-Entry

PST Petroleum Storage Tank

PWC Parks and Wildlife Code

RATP Residential Acoustical Treatment Program

RCRA Resource Conservation and Recovery Act

SAL State Antiquities Landmarks

SAT San Antonio International Airport

SGCN Species of Greatest Conservation Need

SIP State Implementation Plan

SO2 Sulfur Dioxide

SPCC Spill Prevention Control & Countermeasures Plan

SW3P Storm Water Pollution Prevention Plan

TARL Texas Aarchaeological Research Laboratory

TCEQ Texas Commission on Environmental Quality

THC Texas Historical Commission

THPO Tribal Historic Preservation Officer

TNRIS Texas Natural Resources Information System

TPDES Texas Pollutant Discharge Elimination System

TPH Total Petroleum Hydrocarbons

TPWD Texas Parks and Wildlife Department

TWDB Texas Water Development Board

TxDOT Texas Department of Transportation

TXNDD Texas Natural Diversity Database

USACE U.S. Army Corps of Engineers

USC United States Code

USCB U.S. Census Bureau

USDA U.S. Department of Agriculture

USFWS U.S. Fish and Wildlife Service

USGS U.S. Geological Survey

VCP Voluntary Cleanup Program

VOC Volatile Organic Compound

WHA Wildlife Hazard Assessment

WHMP Wildlife Hazard Management Plan

WMA Wildlife Management Area

WOUS Waters of the United States

# 1 Introduction

The purpose of this report is to provide an inventory of sensitive environmental resources within the San Antonio International Airport (SAT) study area in support of airport master planning. This environmental inventory is presented for applicable resource categories outlined in the Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B - Airport Master Plans and FAA Order 1050.1F, Desk Reference.

Per FAA AC 150/5070-6B, master planning is not part of the National Environmental Policy Act (NEPA) process but ensures that supportable and consistent planning and environmental data are provided for use in FAA decision making. Master planning provides a basis for the development of the purpose and need that is carried into the NEPA analysis. This environmental inventory will assist with:

- 1) Determining if additional alternatives are needed to avoid or minimize the impact of the project to sensitive environmental features;
- 2) Defining future environmental coordination and analysis work to develop more thorough work scope for an Environmental Assessment (EA) or Environmental Impact Statement (EIS); and
- 3) Properly understanding the anticipated costs of preliminary/final design, as well as how best to estimate the cost of and schedule for the NEPA process (Appendix D 3.b).

The "study area" analyzed in this environmental inventory was defined during the early stages of the process, in coordination with the City of San Antonio's (CoSA) Aviation Department. The study area is the most recently approved Airport Layout Plan (ALP) and encompasses approximately 2,896 acres within San Antonio, Bexar County, Texas, as shown in **Figure 1**.



Source: Google Earth, 2018.

Figure 1: Boundaries of the Study Area

# 2 Methodology

To identify the environmental resources associated with the study area, Appendix D-1 of the FAA AC 150/5070-6B guided the organization of the overview. The following resource categories are addressed in this inventory: air quality; aquatic resources; hazardous materials and soils; biological resources; socioeconomic conditions and demographics; community resources; cultural resources; Section 4(f), Section 6(f), and Chapter 26 properties; and noise sensitive land uses/receptors. Information was collected through database searches, imagery analyses, Google Maps and Google Earth, desktop Geographic Information System (GIS) analyses, and review of existing environmental studies provided by CoSA and Texas Department of Transportation (TxDOT) San Antonio District. No field

reconnaissance was conducted for the inventory. The online data sources and relevant data used during preparation of this report including figures are listed in **Table 1**.

Table 1: Environmental Inventory On-Line Data Sources (Accessed July 2018)

(Accessed July 2016)	
Online Data Source	Relevant Data
Local Agencies	
Alamo Area Metropolitan Planning Organization (AAMPO) GIS and iMap Viewer  • http://aampo-mpo.opendata.arcgis.com/  • http://www.alamoareampo.org/imap/	Bicycle facilities, greenway system, parks
Bexar County GIS Data  • http://gis-bexar.opendata.arcgis.com/	Parcel data, parks
CoSA GIS Data  • http://www.sanantonio.gov/GIS/GISdata	Airport hazard overlay district, bike routes, city features, city monuments, city services, community resources, future land use, historic landmark sites, land use, libraries, master development plans, parks, public safety facilities, service centers, street centerlines, trails, zoning
State Agencies	
Texas Commission on Environmental Quality (TCEQ)  • https://www.tceq.texas.gov/gis/download-tceq-gis-data/	Edwards Aquifer regulatory boundary, hazardous material sites, permitted wastewater outfalls, water treatment plants, impaired stream segments (303(d)), landfills
TxDOT  • https://www.txdot.gov/inside- txdot/division/environmental/compliance- toolkits/toolkit/archeological-map.html	Cemeteries, potential archaeological liability maps (PALM), roadways
Texas Education Agency • http://tea.texas.gov/Texas_Schools/General_ Information/School_District_Locator/Data_ Download/	Public schools, private schools

Online Data Source	Relevant Data
Texas Historical Commission (THC) • ftp://ftp.thc.state.tx.us/GIS/	Cemeteries, historic districts, historical markers, historic sites, museums, National Register of Historic Places, National Register of Historic districts, neighborhood surveys, state historic sites
Texas Natural Resources Information System (TNRIS)  • https://tnris.org/maps-and-data/	USGS topographic quadrangle maps
Texas Parks and Wildlife Department (TPWD)  • http://tpwd.texas.gov/gis/rtest/  • http://tpwd.texas.gov/huntwild/hunt/wma/	Ecological Mapping Systems of Texas
Texas Water Development Board (TWDB)  • http://www.twdb.texas.gov/mapping/gisdata.asp	Water wells
Federal Agencies	
Federal Emergency Management Agency (FEMA)  • https://msc.fema.gov/portal/	FEMA floodplains
National Map  • https://viewer.nationalmap.gov/basic/  • https://nationalmap.gov/small_scale/attasffp.html	Wildlife management area, refuges, military bases, federal tribal lands, parks
U.S. Census Bureau (USCB)  • https://www.census.gov/geo/maps-data/	Census tracts, Census blocks, urbanized areas
<ul><li>U.S. Department of Agriculture (USDA)/ Natural Resources Conservation Service (NRCS)</li><li>https://datagateway.nrcs.usda.gov/</li></ul>	Soils, prime and unique farmlands
<ul><li>U.S. Environmental Protection Agency (EPA)</li><li>https://www.epa.gov/enviro/geospatial-data-download-service</li></ul>	Hazardous material sites
<ul> <li>U.S. Fish and Wildlife Service (USFWS)</li> <li>https://www.fws.gov/southwest/es/ EndangeredSpecies_Main.html</li> <li>https://www.fws.gov/wetlands/data/mapper.html</li> </ul>	Karst zones, threatened and endangered species, critical habitat, national wetlands inventory

Online Data Source	Relevant Data				
https://www.fws.gov/refuges/refugelocatormaps/					
U.S. Geological Survey (USGS)	National Hydrography				
https://viewer.nationalmap.gov/viewer/	Dataset (NHD), HU-10 watersheds				
Miscellaneous					
Google Earth  • https://www.google.com/earth/	Community facilities				

# 3 Existing Conditions

# 3.1 Air Quality

Air quality is the measure of the condition of the air, expressed in ambient pollutant concentrations and distribution. Under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) develops National Ambient Air Quality Standards (NAAQS) for six common air pollutants including carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM), sulfur dioxide (SO<sub>2</sub>), and lead (Pb). A geographic area is designated according to meeting the NAAQS ("Attainment"), not meeting the standards ("Nonattainment"), or unable to classify due to insufficient data ("Unclassifiable").

Air quality has been an environmental resource concern for the CoSA for human health and economic reasons. Local air quality is impacted by meteorological conditions combined with local and transported emissions outside of the area. According to the Texas Commission on Environmental Quality (TCEQ), San Antonio exceeded the 2015 NAAQS for ozone on May 30, 2018 (SAT 2018). On July 25, 2018, the EPA published a Final Rule (40 Code of Federal Regulations [CFR] Part 81 Federal Register Vol. 83, No. 143), designating Bexar County as the San Antonio, Texas nonattainment area for the establishment of initial air quality designations for the eight counties in the San Antonio-New Braunfels, Texas Core Based Statistical Area for the 2015 primary and secondary NAAQS for ozone. The San Antonio, Texas nonattainment area is classified as Marginal by operation of law according to the severity of the air quality problem. The Final Rule is effective September 24, 2018. Based on Nonattainment designation, the state is required to file a State Implementation Plan (SIP) to concentrate on reduction of emissions from major pollution sources within three years of the designation. CoSA will be required to implement the "new source review" program and the General Conformity Program. CoSA is actively working internally and with partners to improve air quality in the area to assist with complying with federal regulations, improving public health, and for continued economic prosperity. SAT developed a Fleet Environmental Policy to help reduce emissions from vehicle pollutants in their Sustainability Plan (SAT 2011). CoSA's Aviation Department includes a division specific to the Air Quality Health Alert Plan (AQHAP) to consider specialized services and goals (Sustainability Plan).

The resource study area for air quality can extend beyond the study area to include construction and operation of the facility and aircraft and extend vertically up into the mixing height. Additionally, if the master plan increases passengers and capacity, indirect effects outside of the study area should be considered.

# 3.1.1 General Conformity

General Conformity regulations implement Section 176 (C) of the CAA. These regulations cover federally-funded or approved actions that are not covered by the Transportation Conformity Program. The General Conformity requirements (40 CFR Part 93 Subpart A) will apply to SAT at the project level. If future projects include federal actions on Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) highway or transit elements, as well as federal actions on other elements of the project, both requirements may apply (DOT 2011).

The purpose of the General Conformity rule is to ensure that:

- (1) Federal activities do not cause or contribute to new violations of the NAAQS;
- (2) Activities do not worsen existing violations of the NAAQS; and
- (3) Delay of attainment of the NAAQS does not occur.

#### 3.1.2 Hazardous Air Pollutants

The CAA also regulates emissions of hazardous air pollutants (HAPs). HAPs are pollutants that cause or may cause cancer or other serious health effects or adverse environmental and ecological effects.

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the EPA regulate 188 air toxics (also known as HAPs). An emerging issue is the inventory of airport-related speciated organic gases (OGs) including HAPs. NAAQS have not yet been established for HAPs (except for lead), but Section 112 of the CAA authorizes the EPA to regulate emissions of HAPs. Currently, the EPA is tasked with controlling 187 HAPs.

#### 3.1.3 Greenhouse Gases

The potential impact of greenhouse gases from aircraft emissions are another environmental issue for the present and long-term future. This topic should be referenced often during the planning study due to changes in the Council on Environmental Quality's (CEQ) guidance of August 1, 2016 being withdrawn on April 5, 2017, as well as current EPA leadership changes.

# 3.1.4 City Ordinance #2015-11-19-0967

CoSA passed an ordinance in 2015, Ordinance #2015-11-19-0967, requiring businesses with air pollution emissions to register. This ordinance helps CoSA identify local sources of  $O_3$  and proactively work with businesses to address issues and mitigation to improve the area.

# 3.1.5 Aviation Environmental Design Tool

The FAA provides guidance on using the Aviation Environmental Design Tool (AEDT) to conduct environmental modeling if a subsequent action proposed in the master plan requires modeling in a single tool. The AEDT can model aircraft noise, fuel burn, and emissions, which are interdependent, but occur simultaneously, in one tool. Criteria pollutants, HAPs, and fuel burn and

greenhouse gas emissions would be considered in the subsequent alternatives analysis.

# 3.2 Aquatic Resources

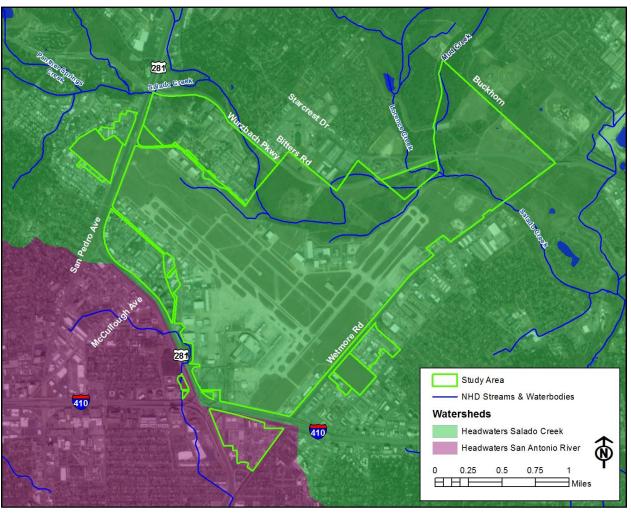
The study area is located within the following two watersheds: (1) Headwaters of Salado Creek (majority of study area), and (2) Headwaters San Antonio River (southernmost portion of study area) (**Figure 2**).

Identified water resources within the study area include Salado Creek and two of its tributaries, Lorence Creek, Mud Creek, and a tributary to Olmos Creek. Floodplain areas associated with these streams are also located in the study area. In addition, one National Wetlands Inventory (NWI) riverine wetland associated with Salado Creek is mapped in the northeastern portion of the study area (**Figure 3**).

#### 3.2.1 Clean Water Act Section 404

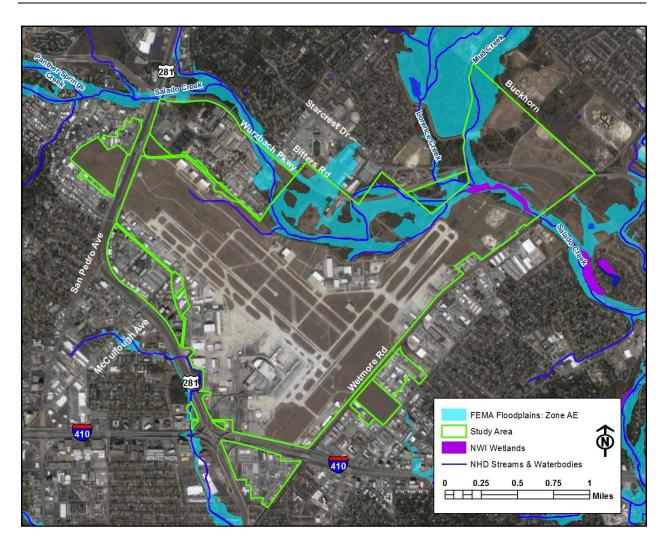
The EPA and U.S. Army Corps of Engineers (USACE) are charged with the protection of "waters of the United States" (WOUS) under the Clean Water Act (CWA) of 1972, as defined in 33 CFR 328.3. Potential WOUS within the study area were identified through desktop review; formal delineations in accordance with USACE guidelines were not conducted at this stage of the planning process. Previous studies have identified USACE jurisdictional WOUS adjacent to the airport at various road crossings and within the Salado Creek riparian area.

As mentioned in **Section 3.2**, potential WOUS within the study area include the following rivers/streams and their tributaries: Salado Creek, Mud Creek, Lorence Creek, and Olmos Creek. There is also one NWI wetland within the study area along Salado Creek that could be a WOUS (dependent on field verifications) and subject to Section 404 of the CWA. Water resources within the study area are depicted in **Figure 3**.



Source: U.S. Geological Survey, National Hydrography Watershed Boundary Dataset.

Figure 2: Watersheds of the Study Area



Source: Federal Emergency Management Agency, National Flood Hazard Layer (NFHL); U.S. Fish and Wildlife Service, National Wetlands Inventory (NWI); U.S. Geological Survey, National Hydrography Dataset (NHD).

# Figure 3: Water Resources of the Study Area

For future projects, jurisdictional determinations and wetland delineations would be conducted in accordance with USACE guidelines. If it is determined that a project would result in the placement of temporary or permanent dredge or fill into potentially jurisdictional WOUS, including wetlands or other special aquatic sites, a Section 404 permit would be obtained and coordination with the USACE may be required.

Future projects would also demonstrate compliance with the EPA's Section 404(b)(1) Guidelines, which are codified at 40 CFR Part 230. These guidelines allow the discharge of dredged or fill material only if there is no practicable alternative that would have less adverse effects on the aquatic ecosystem. An alternative is practicable if it is "available and capable of being done after taking into

consideration cost, existing technology, and logistics in light of overall project purposes."

#### 3.2.2 Clean Water Act Section 401

If a project requires a Section 404 permit, then it must also comply with the TCEQ's Water Quality Certification Program, established under Section 401 of the CWA. If a Nationwide Permit (NWP) is required, the Section 401 certification requirements would be met by implementing approved Best Management Practices (BMPs) from TCEQ's 401 Water Quality Certification Conditions for Nationwide Permits. Alternatively, if an Individual Permit (IP) is required, a Tier I Checklist or Tier II Certification Questionnaire and Alternatives Analysis Checklist would be required and coordinated with the TCEQ and USACE.

#### 3.2.3 Executive Order 11990 Wetlands

According to the USACE, wetlands must possess three essential characteristics: 1) hydrophytic vegetation, (2) wetland hydrology, and (3) wetland soils. Wetland indicators of all three characteristics must be present during some portion of the growing season for an area to be considered a jurisdictional wetland under USACE guidelines. In comparison, only one of the three parameters required by the USACE is necessary to establish a wetland as a NWI wetland. Therefore, many NWI wetlands are not considered jurisdictional wetlands under USACE's guidelines and are not subject to regulation under Section 404 of the CWA.

Executive Order (EO) 11990, *Protection of Wetlands*, prohibits new construction in wetlands unless there is no practicable alternative to such construction, and the project includes all practicable measures to minimize harm to wetlands. As mentioned above, there is one NWI wetland within the study area (**Figure 3**). Formal USACE delineations would be conducted to determine the jurisdictional status of the NWI wetland within the study area. Also, field reconnaissance may identify additional wetlands that could warrant protection.

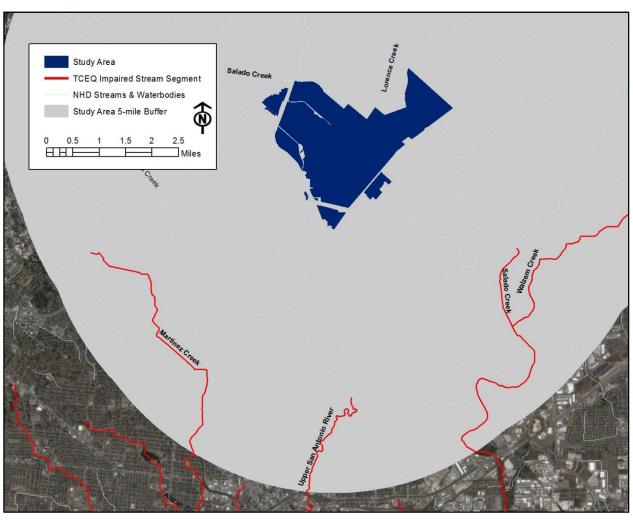
### 3.2.4 Clean Water Act Section 303(d)

According to the 2014 TCEQ Section 303(d) list, there are no threatened or impaired waters within the study area. However, the study area is located within five miles upstream and outfalling into two threatened/impaired waters, as summarized in **Table 2** and depicted in **Figure 4**.<sup>1</sup>

<sup>&</sup>lt;sup>1</sup> There are two additional threatened/impaired streams (Walzem Creek and Martinez Creek) located within a 5-mile radius of the study area (**Figure 4**), but the study area does not outfall into these waters.

Table 2: Threatened and Impaired Waters within Five Miles Upstream of the Study Area

Segment Name (Number)	Location and Parameter	Paramete r	Siz e	Distan ce to Study Area
Salado Creek (1910)	From the confluence with the San Antonio River in Bexar County to the confluence of Beitel Creek in Bexar County	Impaired microben thic communi ty	24. 6 mil es	2.7 miles
Upper San Antonio River (1911)	From a point 600 meters (660 yards) downstream of FM 791 at Mays Crossing near Falls City in Karnes County to a point 100 meters (110 yards) upstream of Hildebrand at San Antonio in Bexar County	Impaired fish communi ty	87. 9 mil es	3.2 miles



Source: Texas Commission on Environmental Quality, 303(d) List Stream Segments.

# Figure 4: Threatened and Impaired Waters near the Study Area

According to the SAT Storm Water Pollution Prevention Plan (SW3P) that was approved in 2016, the operation of SAT was not viewed as a contributor to Salado Creek's impaired fish or macrobenthic community (SAT 2016). BMPs may be required during future project development to control the discharge of pollutants from the project site.

### 3.2.5 Clean Water Act Section 402

Section 402 of the CWA sets forth the National Pollutant Discharge Elimination System (NPDES) Program, which in Texas is administered by the TCEQ under the Texas Pollutant Discharge Elimination System (TPDES) Program. SAT is currently operating under the TCEQ's TPDES *Multi-Sector General Permit* (MSGP), which was renewed on August 14, 2006 for an additional five years. The TXR050000 MSGP

allows for point source discharges of stormwater associated with industrial activity and certain non-stormwater discharges to surface water in the state and discharges to Municipal Separate Storm Sewer Systems (MS4s).

Stormwater discharges resulting from construction activities are not allowed to operate under the MSGP. Instead, the TXR150000 Construction General Permit (CGP) would be utilized for construction projects at SAT. A SW3P would be implemented and a construction site notice would be posted on the construction site. A Notice of Intent (NOI) may be required.

### 3.2.6 Floodplains

A portion of the study area is located within a Federal Emergency Management Agency (FEMA)-designated 100-year floodplain (**Figure 3**, **Table 3**).

Table 3: FEMA Flood Zones within the Study Area

Flood Zone Designation	FEMA Map Panel Number(s)	Zone Description
А	48029C	Areas subject to inundation by the 1-percent annual chance flood event generally determined using approximate methodologies.
AE		Areas subject to inundation by the 1-percent annual chance flood event determined by detailed methods.

Source: FEMA 2010

The FAA must comply with EO 11988, *Floodplain Management*, and U.S. Department of Transportation (DOT) Order 5650.2, *Floodplain Management and Protection*, which require avoidance, to the extent possible, of adverse impacts associated with development in floodplains. If the floodplain cannot be avoided, development must be designed to minimize adverse impacts to the natural and beneficial values of the floodplain. If a significant encroachment to the floodplain is required, the FAA must issue a written finding that the design is the only "practicable alternative" and follow all state and local floodplain regulations.

Bexar County requires a Flood Development Permit for any construction activity in proximity to the 100-year floodplain. A Professional Engineer (P.E.) must conduct a flood study to determine the base flood elevation or to alter the floodplain limits because of the construction activity.

### 3.2.7 Edwards Aquifer

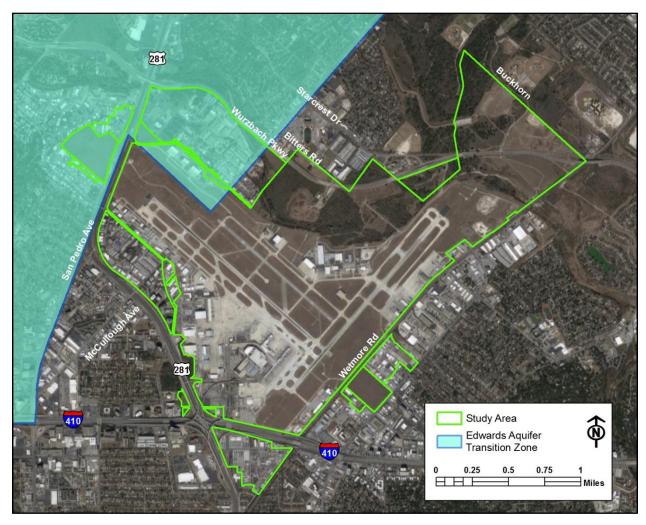
There are two legal requirements that must be addressed when projects have the potential to affect the Edwards Aquifer: (1) the Edwards Aquifer Rules, and (2) the Safe Drinking Water Act. The northern portion of the study area is located within the Edwards Aquifer Transition Zone (**Figure 5**).

# **Edwards Aquifer Rules**

The study area is not located within the Edwards Aquifer Contributing Zone (EACZ) or Edwards Aquifer Recharge Zone (EARZ). Therefore, the Edwards Aquifer Rules do not apply.

# Safe Drinking Water Act

The Safe Drinking Water Act prohibits any federal agency from funding actions that would contaminate an EPA-designated sole source aquifer or its recharge area. The Edwards Aquifer is an EPA-designated sole source aquifer. As mentioned above, the northern portion of the study area is located within the Edwards Aquifer Transition Zone (**Figure 5**). Coordination with the TCEQ is not required for projects located within the Transition Zone.



Source: Texas Commission on Environmental Quality, Edwards Aquifer Zones.

Figure 5: Edwards Aquifer Zones within the Study Area

# 3.2.8 Other Federal Regulations

The following federal acts/entities are not discussed in this environmental inventory due to the geographic location of the study area, which does not contain resources covered under these statutes or authorities:

- Rivers and Harbors Act;
- Wild and Scenic Rivers;
- Coastal Zone Management Act and Coastal Zone Management Program; and
- International Boundary and Water Commission (IBWC).

### 3.3 Hazardous Materials and Soils

# 3.3.1 Hazardous Materials

FAA guidelines recommend avoiding encroachment and acquisition of hazardous waste sites and contaminated properties, to the extent possible.

A database search was conducted, and existing environmental reports prepared for CoSA and TxDOT San Antonio District were reviewed to identify sites with contamination concerns within the ALP and ASTM search radius. A complete listing of the identified hazardous materials sites within and near the study area is included in *Regulatory Database Report* (Banks 2018), which is provided under separate cover. The regulatory databases searched as part of this analysis are listed in **Table 4**.

Table 4: Hazardous Materials Regulatory Database Summary within 0.5-Mile of the Study Area

Regulatory Record	# of Sites Identified
Federal Active NPL or Not NPL List	0
Federal Archived or Not NPL List (CERCLIS or	1
SEMS Sites)	'
RCRA CORRACTS	0
RCRA TSD	1
RCRA Generators	24
EPA / TCEQ Brownfield Properties	0
ERNS List	33
TCEQ Superfund Sites	0
TCEQ Municipal Solid Waste Landfill Sites	34
(MSW)	54
TCEQ Leaking Petroleum Storage Tank Lists	108
(LPST)	100
TCEQ Registered Petroleum Storage Tank Lists	150
(PST)	130
Federal / State Institutional Control	1
Federal / State Engineering Control	0
TCEQ Voluntary Cleanup Program Sites (VCP)	3
TCEQ Industrial Hazardous Waste Sites (IHW)	139

Source: Banks 2018

Waste Generators (RCRA TSDs, RCRA Generators, TCEQ IHWs)

The EPA and TCEQ track waste generators and transporters using Resource Conservation and Recovery Act (RCRA) guidelines. A total of 164 sites were identified in the third-party database search that generate various kinds of hazardous waste. However, no evidence or documents of spills were identified from any these sites.

# **ERNS List Spill Reports**

SAT has been in operation since 1942, and over that time, numerous spills of fuels and other materials have occurred. A total of 33 spill events were identified in the database search, 32 of which were reported within the study area. In most instances, these spills were the result of human error or equipment failure releasing jet fuel or diesel in aircraft maintenance areas and were promptly contained and cleaned.

# Contaminated Sites (LPSTs, VCPs)

According to the third-party database search, there are no Superfund sites at or near the study area. TCEQ records show that there are nine Superfund sites (state and federal) located in Bexar County, the nearest of which is approximately five miles to the south of the study area (TCEQ 2018a).

In Texas, the TCEQ regulates petroleum storage tanks (PSTs) and requires reporting and documentation when a PST leak has been discovered. These leaking sites are managed by TCEQ's Leaking Petroleum Storage Tank (LPST) Program. The third-party database search documented 108 LPST sites within a half-mile of the study area, 40 of which are within the study area. Nine of the LPST cases within the study area resulted in the contamination of groundwater. In most cases, the responsible parties were commercial or industrial tenants at the airport. All of the 40 LPST cases within the study area have been closed by the TCEQ. However, TCEQ closure does not necessarily mean that contamination is no longer present or that remediation was completed. During project development, additional analysis would be conducted to determine if potential contamination could impact the project. The LPST sites are mapped within the *Regulatory Database Report* (Banks 2018), which is provided under separate cover.

The Green Light Company is a fertilizer and pesticide processing facility located within the study area at 10511 Wetmore Road. This facility was identified in the database search as a Voluntary Cleanup Program (VCP) site. This site has a history of illicit discharges dating back to 1981; these discharges resulted in contamination of soil and groundwater (CoSA, 2010). Chemicals of concern include volatile organic compounds (VOCs), metals, pesticides, and hydrocarbon constituents (total petroleum hydrocarbons [TPH]). Subsurface flow of groundwater has caused contamination to migrate further into the study area. This facility entered the VCP program in 2002 and an institutional control was placed on the property to restrict the land use to non-residential in 2014. Efforts to clean up the site are ongoing (Banks 2018). This site could be a project-specific concern, but further research should be conducted if a project is to be considered

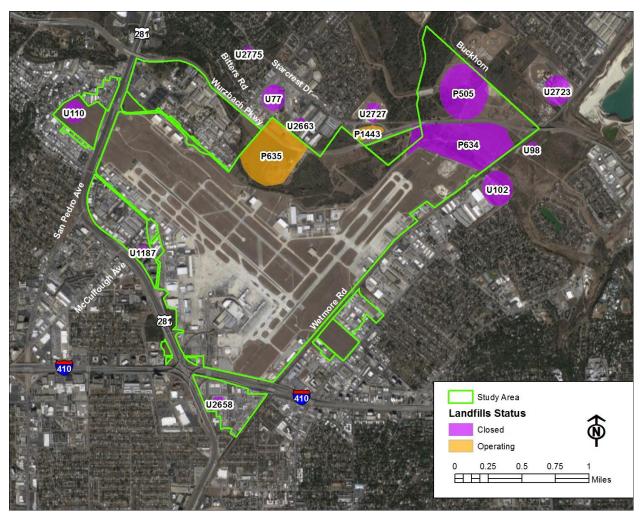
in the vicinity of this site.

# Solid Waste (MSW)

A total of 22 municipal solid waste (MSW) landfill sites were identified within a 0.5-mile radius of the study area. All but four of these landfill sites are closed (AACOQ 2018; Banks 2018). Seven of these facilities are located within the study area, including six closed landfills (U110, U1187, U2658, P505, P634, Taxiway R), and an active resource recovery/recycling facility (P635). These sites are summarized in **Table 5**, displayed on **Figure 6**, and discussed below.

**Table 5: Solid Waste Facilities within the Study Area** 

Site ID	Location	Name	Permit/Type	Approxim ate Size (acres)	Status
P634	11231 Wetmore Rd	Wetmore Road Landfill	Yes / Standard MSW	67	Closed
P635	1826 Bitters Rd	Bitters Shredding Site	Yes / Shredding & grinding facility	118	Active
P505	Buckhorn	Joint Cities LRB Landfill	Yes / Standard MSW	95	Closed
U110	West End of Nakoma at Warfield	Nakoma Drive at Warfield Drive	No / Unauthorized	15	Closed
67017	457 Sandau Rd	Taxiway R	No / Unauthorized	5	Closed
U1187	10101 Reunion Pl	Union Square	No / Unauthorized	5	Closed
U2658	Hallmark & Airport	Hallmark / Airport	No / Unauthorized	5	Closed



Sources: AACOG 2018; Banks 2018; Medina Consulting 2009

Source: Alamo Area Council of Governments, Bexar County Inventory of Closed or Abandoned Landfills; Texas

Commission on Environmental Quality, Municipal Solid Waste Facilities; Banks Environmental Data, Inc., Regulatory

Database Report – 17029-WSP28445A.

Figure 6: Municipal Solid Waste Facilities near the Study Area

The Wetmore Road Landfill (P634) is an approximately 67-acre, closed MSW landfill. According to available reports, this landfill is unlined, allowing the potential for leaching of contaminants out of the landfill area (BAH 2007). Altering or moving waste from this facility would require special permitting procedures.

Bitter's Brush Recycling Center is an active vegetation shredding/grinding facility located on top of a closed landfill known as the Bitters Shredding Site (P635). This landfill contains buried wastes, including brush and yard waste, construction and demolition debris, and other wastes.

Taxiway R (67017) is an unlisted landfill unit that was encountered on the airport north of Runway 12L between Skyplace Boulevard, Cessna Drive, and Taxiway R. In the mid-1960s, waste was dumped in a former quarry at this location and covered with soil in the 1980s (Medina Consulting 2009). Remedial activities (removal of all buried waste) began in 2007 and concluded in 2009. The TCEQ issued a letter acknowledging completion of remediation at this site on January 22, 2010.

An active MSW transfer station (P1443) that is owned and operated by Texas Disposal Systems is located adjacent to the study area. Waste at this facility is transferred to an MSW landfill near Austin, Texas.

The Joint Cities LRB Landfill (P505) is a former MSW landfill that opened in 1969 and closed in 1990. Nakoma Drive at Warfield Street (U110) is a closed, unpermitted landfill that was identified in a 1968 U.S. Health Department survey. The Union Square Landfill (U1187) and the Hallmark/Airport Landfill (U2658) are closed, unpermitted landfills with unknown dates of operation, waste types, and sizes (unknown sizes are estimated at 5 acres (AACOG, 2018).

There are no known applications for new MSW facilities near the study area. When new or expanded MSW landfills are proposed near SAT, the landfill operators must notify the airport operator and the FAA of the proposal as early as possible pursuant to 40 CFR 258, *Criteria for Municipal Solid Waste Landfills*, Section 258.10, *Airport Safety*.

### Pollution Prevention

SAT maintains current pollution prevention documents including a SW3P and a Spill Prevention Control and Countermeasures Plan (SPCC). These documents help to properly manage stormwater runoff and to ensure SAT is ready to respond to spills. The most current documents should be referenced and adhered to for any project-specific planning. Any future developments of the airport property would

require updates to the facility's SW3P and SPCC.

# 3.3.2 Soils

According to the Natural Resources Conservation Service's (NRCS) Web Soil Survey, the study area consists of 17 soil types, as described in **Table 6** and depicted in **Figure 7**.

SAT has a Soil Management Plan that creates practices for managing soil generated or handled by airport projects. These practices ensure compliance with federal, state, and local rules and regulations regarding excavated or imported soil and related management.

Table 6: Soil Map Units within the Study Area

i abie c	o. Son map om	C2 MICHILI	tne Study Area
Soil Map Unit	Name	Acres in Study Area	Description
AuB	Austin silty clay, 1 to 3 percent slopes	108.2	Moderately deep, well-drained and slowly permeable soils formed in residuum
AuC	Austin silty clay, 2 to 5 percent slopes, eroded	72.7	weathered from chalk; found level to sloping erosional uplands
BrD	Brackett gravely clay loam, 3 to 12 percent slopes	1.0	Well-drained soils formed in residuum weathered from limestone; found on backslopes of ridges
BsC	Whitewright- Austin complex, 1 to 5 percent slopes	179.1	Whitewright: Well-drained soils formed in residuum derived from weakly cemented chalk and marl; found on convex ridges on dissected plains Austin: Moderately deep, well-drained and slowly permeable soils formed in residuum weathered from chalk; found level to sloping erosional uplands
Cb	Crawford and Bexar stony soils	53.4	Crawford: Well-drained, very slowly permeable soils formed in clayey sediments that are underlain by indurated limestone bedrock Bexar: Well-drained, slowly permeable soil; found on upland plains
HnC2	Heiden clay, 3 to 5 percent slopes, eroded	61.0	Well-drained, very slowly permeable soil that is formed in clayey residuum weathered from mudstone; found on footslopes of base slopes, shoulders of interfluves and backslopes of side slopes on dissected plains
HoD3	Heiden-Ferris complex, 5 to 10 percent slopes, severely eroded	42.5	Heiden: Well-drained, very slowly permeable soil that is formed in clayey residuum weathered from mudstone; found on footslopes of base slopes, shoulders of interfluves and backslopes of side slopes on dissected plains  Ferris: Well-drained, very slowly permeable soils formed in clayey residuum weathered from calcareous mudstone; found on backslopes of side slopes of ridges on

Soil Map Unit	Name	Acres in Study Area	Description
			dissected plains
HsB	Houston Black clay, 1 to 3 percent slopes	28.2	Moderately well-drained, very slowly permeable soils that formed in clayey residuum from calcareous mudstone; found on interfluves and side slopes on upland ridges and plains on dissected plains
HtA	Branyon clay, 0 to 1 percent slopes	538.1	Moderately well-drained, very slowly permeable soils formed in calcareous clayey
HtB	Branyon clay, 1 to 3 percent slopes	4.5	alluvium derived from mudstone; found on stream terraces on river valleys
LvA	Lewisville silty clay, 0 to 1 percent slopes	280.7	Well-drained, moderately permeable soils formed in ancient loamy and clayey
LvB	Lewisville silty clay, 1 to 3 percent slopes	662.7	calcareous sediments; found on uplands
РаВ	Patrick soils, 1 to 3 percent slopes, rarely flooded	535.2	Well-drained soils formed in clayey over gravelly alluvium derived from shale,
PaC	Patrick soils, 3 to 5 percent slopes, rarely flooded	60.0	claystone or siltstone; found on stream terraces on dissected plains
Pt	Pits and Quarries, 1 to 90 percent slopes	124.4	Areas that have been excavated for rock used in road building or construction
ТаВ	Eckrant cobbly clay, 1 to 8 percent slopes	21.6	Well-drained, moderately permeable soils that are very shallow to shallow over indurated limestone bedrock; found on summits, shoulders and backslopes of ridges on dissected plateaus
Tf	Tinn and Frio soils, 0 to 1 percent slopes, frequently flooded	248.0	Tinn: Moderately well-drained, very slowly permeable soils formed in calcareous clayey alluvium; found on floodplains of dissected plains Frio: Well-drained, moderately slowly permeable soils formed in calcareous and clayey alluvium; found on floodplains

PaB LvB Study Area Soil Types AuB HtB AuC LvA BrD LvB BsC PaB PaC HoD3 ТаВ HsB Tf 0.25 0.75

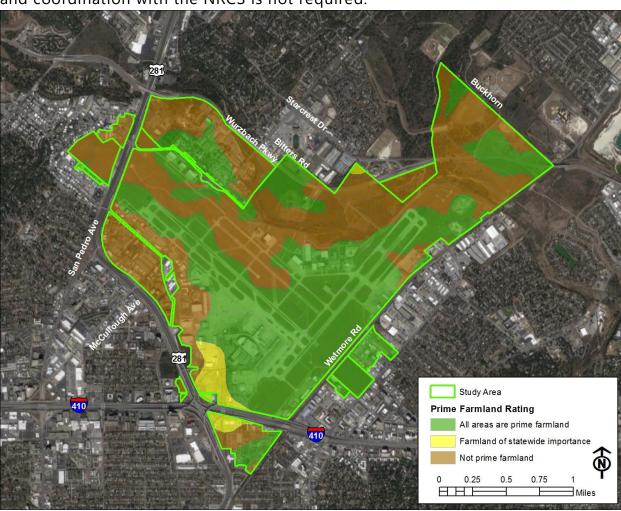
Source: USDA, 2018a

Source: U.S. Department of Agriculture, Web Soil Survey (WSS).

Figure 7: Soil Map of the Study Area

#### 3.3.3 Farmlands

The Farmland Protection Policy Act (FPPA), as codified in 7 United States Code (USC) 4201 through 4209, was enacted in 1981 "to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses and to assure that federal programs are administered in a manner that, to the extent practicable, will be compatible with state, unit of local government, and private programs and policies to protect farmland." All federal projects must address the FPPA. However, the FPPA does not apply to projects that do not require federal funding or do not intend to use land that meets the criteria to qualify as prime farmland or farmland of state and local importance. According to the NRCS Web Soil Survey, there are areas within the study area that are classified as prime farmland or farmland of statewide importance, as shown in **Figure 8** and **Table 7**. However, the study area is located within a developing, urbanizing setting, as classified by the U.S. Census Bureau (**Figure 9**). Therefore, the study area is exempt from the requirements of the FPPA



and coordination with the NRCS is not required.

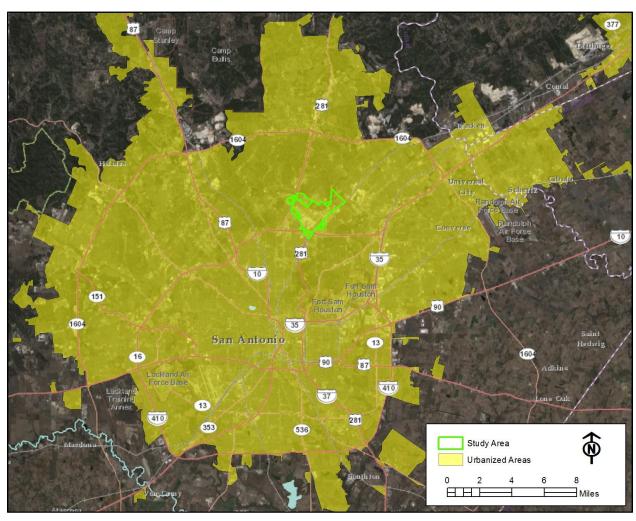
Source: U.S. Department of Agriculture, Web Soil Survey (WSS).

Figure 8: Farmland Soils within the Study Area

**Table 7: Farmland Soils within the Study Area** 

Soil Map Unit	Name	Acres within Study Area	Farmland Rating
AuB	Austin silty clay, 1 to 3 percent slopes	108.2	Farmland of statewide importance
HsB	Houston Black clay, 1 to 3 percent slopes	28.2	All areas are prime farmland
HtA	Branyon clay, 0 to 1 percent slopes	538.1	All areas are prime farmland
HtB	Branyon clay, 1 to 3 percent slopes	4.5	All areas are prime farmland
LvA	Lewisville silty clay, 0 to 1 percent slopes	280.7	All areas are prime farmland
LvB	Lewisville silty clay, 1 to 3 percent slopes	662.7	All areas are prime farmland

Source: USDA, 2018b



Source: U.S. Census Data.

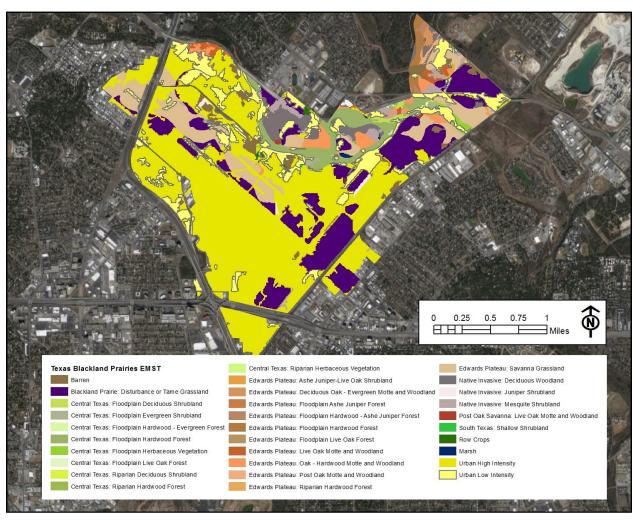
Figure 9: Urbanized Area of the Study Area

# 3.4 Biological Resources

## 3.4.1 Vegetation

The study area lies within the Blackland Prairies Natural Region, as defined by the Texas Parks and Wildlife Department (TPWD). The Blackland Prairies region once supported a tallgrass prairie dominated by tall-growing grasses such as big bluestem (Andropogon gerardii), little bluestem (Schizachyrium scoparium), Indiangrass (Sorghastrum nutans), and switchgrass (Panicum virgatum). However, because of the fertile soils, much of the original prairie has been plowed to produce food and forage crops. Crop production and cattle ranching are the primary agricultural industries that exist within former Blackland Prairie areas.

The study area is largely developed and consists of urban vegetation on the southern portion and a riparian area along Salado Creek. According to the Ecological Mapping System of Texas (EMST), the study area is mapped as 31 different vegetation types, as shown in **Figure 10** and summarized in **Table 8**.



Source: Texas Parks and Wildlife Department, Ecological Mapping Systems of Texas: Texas Blackland Prairies EMST.

Figure 10: Mapped EMST Types of the Study Area

Table 8: Mapped EMST Vegetation Types of the Study Area

Table 8: Mapped EMST Ve	getation Types of the		
EMST Type	Ecosystem Names	Level 3 Ecoregion	Level 4 Ecoregion
Blackland Prairie: Disturbance or Tame Grassland	Open Pit, Clay Loam 25- 35" PZ, Blackland PE 44- 64, Clay Loam PE 44-64		j
Post Oak Savanna: Live Oak Motte and Woodland	Open Pit		
Edwards Plateau: Floodplain Ashe Juniper Forest	Clayey Bottomland PE 44- 64		
Edwards Plateau: Floodplain Live Oak Forest	Clayey Bottomland PE 44- 64		
Edwards Plateau: Floodplain Hardwood – Ashe Juniper Forest	Clayey Bottomland PE 44- 64		
Edwards Plateau: Floodplain Hardwood Forest	Clayey Bottomland PE 44- 64		
Edwards Plateau: Live Oak Motte and Woodland	Deep Redland PE 44+, Chalky Ridge PE 44-64		
Edwards Plateau: Deciduous Oak – Evergreen Motte and Woodland	Clay Loam 25-35" PZ, Chalky Ridge PE 44-64		
Edwards Plateau: Oak – Hardwood Motte and Woodland	Chalky Ridge PE 44-64	Northern Blackland	Texas Blackland
Edwards Plateau: Savanna Grassland	Deep Redland PE 44+, Low Stony Hill PE 44+, Chalky Ridge PE 44-64, Chalky Ridge PE 44-64	Prairie	Prairies
Edwards Plateau: Post Oak Motte and Woodland	Deep Redland PE 44+		
Edwards Plateau: Ashe Juniper- Live Oak Shrubland	Adobe PE 44+, Deep Redland PE 44+, Chalky Ridge PE 44-64		
Edwards Plateau: Riparian Hardwood Forest	Clay Loam 25-35" PZ, Deep Redland PE 44+		
Central Texas: Floodplain Live Oak Forest	Clayey Bottomland PE 44- 64		
Central Texas: Floodplain Hardwood – Evergreen Forest	Clayey Bottomland PE 44- 64		
Central Texas: Floodplain Hardwood Forest	Clayey Bottomland PE 44- 64		
Central Texas: Floodplain Evergreen Shrubland	Clayey Bottomland PE 44- 64		

EMST Type	Ecosystem Names	Level 3	Level 4
**	•	Ecoregion	Ecoregion
Central Texas: Floodplain	Clayey Bottomland PE 44-		
Deciduous Shrubland	64		
Central Texas: Floodplain	Clayey Bottomland PE 44- 64		
Herbaceous Vegetation Central Texas: Riparian	04		
Hardwood Forest	Chalky Ridge PE 44-64		
Central Texas: Riparian Deciduous Shrubland	Chalky Ridge PE 44-64		
Central Texas: Riparian Herbaceous Vegetation	Open Pit		
South Texas: Shallow Shrubland	Chalky Ridge PE 44-64		
	Deep Redland PE 44-64,		
	Clay Loam 25-35" PZ,		
<b>D</b>	Blackland PE 44-64, Chalky		
Barren	Ridge PE 44-64, Clayey		
	Bottomland PE 44-64, Clay		
	Loam 44-64		
Marsh	Chalky Ridge PE 44-64		
Native Invasive: Deciduous	Open Pit, Clay Loam 25-		
Woodland	35" PZ, Blackland PE 44-		
	64, Clay Loam PE 44-64		
Native Invasive: Juniper	Clay Loam 25-35" PZ, Clay		
Shrubland	Loam PE 44-64		
	Open Pit, Deep Redland PE		
Native Invasive: Mesquite	44+, Clay Loam 25-35" PZ,		
Shrubland	Blackland PE 44-64, Chalky		
	Ridge PE 44-64, Clay Loam PE 44-64		
	Open Pit, Clay Loam 25-		
Row Crops	35" PZ, Chalky Ridge PE		
Now Crops	44-64		
	Open Pit, Adobe PE 44+,		
	Low Stony Hill PE 44+,		
	Clay Loam 25-35" PZ,		
Urban High Intensity	Blackland PE 44-64, Chalky		
	Ridge PE 44-64, Clayey		
	Bottomland PE 44-64, Clay		
	Loam PE 44-64		
	Open Pit, Deep Redland PE		
Urban Low Intensity	44+, Clay Loam 25-35" PZ,		
	Blackland PE 44-64, Chalky		

EMST Type	Ecosystem Names	Level 3 Ecoregion	Level 4 Ecoregion
	Ridge PE 44-64, Clayey		
	Bottomland PE 44-64, Clay		
	Loam 44-64		

Source: TPWD 2018a

As future projects are developed, site investigations would be conducted to field-verify vegetation types and to determine the presence or absence of habitats. During project development, efforts should be made to avoid the removal of vegetation, especially mature woody vegetation. In addition, impacts to vegetation should be minimized to the extent possible during project construction.

EO 13112, *Invasive Species*, 64 Federal Register 6183, (February 8, 1999) prohibits federal agencies to carry out actions that are likely to cause or promote the introduction of invasive species unless the benefits outweigh the potential harm, and all measures have been taken to avoid and minimize risk of harm. CoSA would comply with EO 13112 during project development.

#### 3.4.2 Wildlife

The study area is highly urbanized; therefore, most of the wildlife species observed in and/or likely to occupy the study area are habitat generalists that are tolerant of high-intensity human developments. These include species such as raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), mourning dove (*Zenaida macroura*), blue jay (*Cyanocitta cristata*), white-tailed deer (*Odocoileus virginiana*), and a variety of insects and invertebrates.

# Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-712, as amended) states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance with the MBTA's policies and regulations. According to a memo from the U.S. Department of the Interior (DOI) dated December 22, 2017, the MBTA does not prohibit incidental take.

According to the USFWS' *Trust Resource Report* for the study area, two migratory bird species have the potential to occur in the study area, as described in **Table 9**.

**Table 9: Migratory Bird Species in the Study Area** 

Common Name	Scientific Name	Seasonal Occurrence	Preferred Habitat	Potential Habitat in Study Area?
Harris's Sparrow	Zonotrichia querula	Wintering	Hedgerows, agricultural fields, shrubby pastures, backyards, and shrubby areas near streams	Yes
Lesser Yellowlegs	Tringa flavipes	Migration	Occurs widely in migration, including coastal estuaries, salt and fresh marshes, edges of lakes and ponds; typically more common on freshwater habitats	No

Source: U.S Fish & Wildlife 2018b

EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Federal Register 3853, (January 17, 2001) guides federal agencies to take action to further implement the MBTA. In December 2002, the FAA signed a Memorandum of Agreement (MOA) with the USFWS and other federal agencies to address aircraft-wildlife strikes.

Although comprehensive surveys were not conducted in the study area at this stage of the master planning process, it is assumed that migratory birds could be present in the study area, particularly in bridges, culverts, and vegetation. If migratory birds are encountered on-site during project construction, every effort should be made to avoid protected birds, active nests, eggs, and/or young. In the case that birds nest in a structure to be replaced, all old migratory bird nests would be removed outside of the nesting season from any structure where work would be done. In addition, SAT would be prepared to prevent migratory birds from building nests during the nesting season.

#### Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) of 1934, as amended, was enacted to protect wildlife when federal actions result in the control or modification of a natural stream or body of water. The FWCA requires federal agencies to take into consideration the effect that water-related projects would have on fish and wildlife resources, take action to prevent loss or damage to these resources, and provide for the development and improvement of these resources.

The FWCA applies to projects that would result in the control or modification of a

natural stream or body of water and would require a CWA Section 404 IP. As discussed in **Section 3.2**, there are ephemeral streams and wetlands within the study area that could require a Section 404 IP, dependent on project impacts. If a project were authorized under an IP, coordination with the USFWS under the FWCA would be required.

### Bald and Golden Eagle Protection Act of 2007

The Bald and Golden Eagle Protection Act (BGEPA) was enacted in 1940 to provide for the protection of the Bald Eagle (*Haliaeetus leucocephalus*) and the Golden Eagle (*Aquila chrysaetos*) by prohibiting (except under certain specified conditions) the taking, possession, and sale of such birds. The BGEPA applies to projects with the potential to take bald or golden eagles. No potential habitat for bald or golden eagles is present in the study area; therefore, the BGEPA would not apply during project development.

## Wildlife Hazard Assessment and Wildlife Hazard Management Plan

A Wildlife Hazard Assessment (WHA) and Wildlife Hazard Management Plan (WHMP) are required under FAA's Wildlife Hazardous Management at Airports to ensure a safe operating environment and to assess the risk and magnitude of wildlife strikes at the airport. According to the FAA, some of the most hazardous wildlife to airport operations include gulls, waterfowl, raptors, and deer. Land uses that attract these species include putrescible-waste disposal operations, wastewater treatment facilities, wetlands, and dredge spoil containment areas.

According to the FAA, the Wildlife Hazard Mitigation Program has several initiatives underway that should be considered during project development including a new FAA AC 150/5200-38-Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans (FAA 2018). The Safety and Wildlife Division of SAT received approval from the FAA in 2012 for a WHA and WHMP. In 2012, additional steps were taken to mitigate the jackrabbit population at the airport (SAT 2012).

#### Other Federal Regulations

The following federal acts do not apply to the geographic location of the study area:

- Magnuson-Stevens Fishery Conservation Management Act
- Marine Mammal Protection Act

## 3.4.3 Threatened and Endangered Species

A review of the threatened and endangered species lists for the study area, maintained by the USFWS and TPWD, identified federal- and state-listed threatened, endangered, and candidate species, as well as other species considered rare by the State of Texas. **Table 10** lists these species and describes their habitat requirements.

Table 10: Threatened, Endangered, Candidate, SGCN, and Rare Species of Occurrence in the Study Area

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Amphibians				

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Cascade Caverns Salamander (Eurycea latitans complex)	-	Т	Endemic; subaquatic; springs and caves in Medina River, Guadalupe River, and Cibolo Creek watersheds within Edwards Aquifer area	No
Comal Blind Salamander (Eurycea tridentifera)	-	Т	Endemic; semi-troglobitic; found in springs and waters of caves	No
San Marcos Salamander ( <i>Eurycea nana</i> )	Т	-	Shallow, alkaline springs carved out of limestone with sand and gravel substrates; the thick moss and algae that cover the shallow pools around the springs provide excellent habitat	No
Texas Blind Salamander (Typhlomolge rathbuni)	E	-	Subterranean water systems in Edwards Plateau in Texas; springs and caves; has been found in wells, but is usually restricted to caves	No
Texas Salamander (Eurycea neotenes)	-	-	Endemic; troglobitic; springs, seeps, cave streams, and creek headwaters; often hides under rocks and leaves in water; restricted to Helotes and Leon Creek drainages	No
Arachnids		ı		
Bracken Bat Cave Meshweaver (Cicurina venii)	E	-	Karst features in north and northwest Bexar County	Possible- a karst feature survey would be completed during project development
Cokendolpher Cave Harvestman (Texella cokendolpheri)	E	-	Karst features in north and northwest Bexar County	Possible- a karst feature survey would be completed during project development

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Government Canyon Bat Cave Meshweaver (Cicurina vespera)	E	-	Karst features in north and northwest Bexar County	Possible- a karst feature survey would be completed during project development
Government Canyon Bat Cave Spider (Neoleptoneta microps)	E	-	Karst features in north and northwest Bexar County	Possible- a karst feature survey would be completed during project development
Madla's Cave Meshweaver (Cicurina madla)	E	-	Karst features in north and northwest Bexar County	Possible- a karst feature survey would be completed during project development
Robber Baron Cave Meshweaver (Cicurina baronia)	E	-	Karst features in north and northwest Bexar County	Possible- a karst feature survey would be completed during project development
Birds				

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
American Peregrine Falcon (Falco peregrinus anatum)	DL	Т	Year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in U.S. and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; lowaltitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands	No; potential occurrences during migration
Arctic Peregrine Falcon (Falco peregrinus tundrius)	DL	-	Migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; lowaltitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands	No; potential occurrences during migration

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Black-Capped Vireo (Vireo atricapilla)	DL	E	Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; return to same territory, or one nearby, year after year; deciduous and broad-leaved shrubs and trees provide insects for feeding; species composition less important than presence of adequate broad-leaved shrubs, foliage to ground level, and required structure; nesting season March-late summer	No
Golden-Cheeked Warbler (Setophaga chrysoparia)	E	E	Juniper-oak woodlands; dependent on Ashe juniper (also known as cedar) for long fine bark strips, only available from mature trees, used in nest construction; nests are placed in various trees other than Ashe juniper; only a few mature junipers or nearby cedar brakes can provide the necessary nest material; forage for insects in broadleaved trees and shrubs; nesting late March-early summer	No

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Least Tern (Sterna antillarum)	E	E, SGCN	Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also known to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc.); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony	No
Mountain Plover (Charadrius montanus)	-	SGCN	Breeding: nests on high plains or shortgrass prairie, on ground in shallow depressions; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous	No
Peregrine Falcon (Falco peregrinus)	DL	Т	Both subspecies migrate across the state from more northern breeding areas in U.S. and Canada to winter along coast and farther south; subspecies (F.p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ; F.p. tundrius is no longer listed in Texas, but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat	No; potential occurrences during migration

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Piping Plover (Charadrius melodus)	Т	-	Usually nest above the high tide line on coastal beaches, sand flats at the ends of sandpits and barrier islands, gently sloping dunes, blowout areas behind primary dunes, sparsely vegetated dunes, and wash over areas cut into or between dunes; feeding areas include inter-tidal portions of ocean beaches, wash over areas, mudflats, sand flats, wrack lines, and shorelines of coastal ponds, lagoons, or salt marshes; wintering plovers on the Atlantic Coast are generally found at accreting ends of barrier islands, along sandy peninsulas, and near coastal inlets	No
Red Knot (Calidris canutus rufa)	Т	-	Migrate long distances in flocks northward through the contiguous U.S. mainly April-June, southward July-October; prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters; primarily seacoasts on tidal flats and beaches, herbaceous wetlands, and tidal flat/shores	No

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Sprague's Pipit (Anthus spragueii)	-	SGCN	Only in Texas during migration and winter, mid-September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges	No
Western Burrowing Owl (Athene cunicularia hypugaea)	-	-	Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows	Yes – open grassland areas within the study area provide suitable habitat
White-Faced Ibis (Plegadis chihi)	-	Т	Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats	No
Whooping Crane (Grus americana)	E	E	Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties	No

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Wood Stork (Mycteria americana)	-	T, SGCN	Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including saltwater; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960	Possible – floodplain areas associated with Salado Creek could provide suitable habitat
Zone-Tailed Hawk (Buteo albonotatus)	-	Т	Arid open country, including open deciduous or pine-oak woodland, mesa or mountain country, often near watercourses, and wooded canyons and tree-lined rivers along middle-slopes of desert mountains, nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in high mountain regions	No
Crustaceans				
Cave Obligate Crustacean (Monodella texana)	-	-	Subaquatic, subterranean obligate; underground freshwater aquifers	No
Peck's Cave Amphipod (Stygobromus pecki)	E	-	Restricted to Comal Springs and Hueco Springs in Comal County	No
Fishes				

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Fountain Darter (Etheostoma fonticola)	E	SGCN	Spring-fed streams (upper San Marcos and Comal Rivers) deriving from the Edwards Aquifer	No
Guadalupe Bass (Micropterus treculii)	-	SGCN	Endemic to perennial streams of the Edwards Plateau region; introduced in Nueces River system	No
Toothless Blindcat (Trogloglanis pattersoni)	-	T, SGCN	Troglobitic, blind catfish endemic to the San Antonio Pool of the Edwards Aquifer	No
Widemouth Blindcat (Satan eurystomus)	-	T, SGCN	Troglobitic, blind catfish endemic to the San Antonio Pool of the Edwards Aquifer	No
Insects				
Beetle (Rhadine exilis)	E	-	Small, essentially eyeless ground beetle; karst features in north and northwest Bexar County	Possible- a karst feature survey would be completed during project development
Beetle (Rhadine infernalis)	E	-	Small, essentially eyeless ground beetle; karst features in north and northwest Bexar County	Possible- a karst feature survey would be completed during project development
Comal Springs Dryopid Beetle (Stygoparnus comalensis)	E	-	Restricted to Comal Springs and Fern Bank Springs	No
Comal Springs Riffle Beetle (Heterelmis comalensis)	E	-	Known from Comal Springs (spring runs 1, 2, and 3) in Comal County and from a single specimen in San Marcos Springs in Hays County	No

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Helotes Mold Beetle ( <i>Batrisodes</i> <i>venyivi</i> )	E	-	Small, eyeless mold beetle; karst features in northwestern Bexar County and northeastern Medina County	Possible- a karst feature survey would be completed during project development
Manfreda Giant- Skipper (Stallingsia maculosus)	-	-	Subtropical thorn forest and pine forest; found in southern Texas and south of the border in northern Mexico; larval hostplant in Texas tuberose	No
Mammals				
Black Bear (Ursus americanus)	-	T, SGCN	Bottomland hardwoods and large tracts of inaccessible forested areas	No
Cave Myotis Bat (Myotis velifer)	-	SGCN	Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned cliff swallow nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum caves of Panhandle during winter	Possible – bridges and old buildings in the study area could provide suitable habitat
Gray Wolf (Canis lupus)	LE	E	Extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands	No
Plains Spotted Skunk (Spilogale putorius interrupta)	-	-	Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie	Yes – wooded and grassland areas in the study area provide suitable habitat

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Red Wolf (Canis rufus)	LE	E	Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies	No
Mollusks				
Golden Orb (Quadrula aurea)	С	Т	Sand and gravel in some locations and mud at others; found in lentic and lotic; Guadalupe, San Antonio, Lower San Marcos, and Nueces River basins	No
Mimic Cavesnail (Phreatodrobia imitata)	-	-	Subaquatic; only known from two wells penetrating the Edwards Aquifer	No
Texas Fatmucket (Lampsilis bracteata)	С	-	Streams and rivers on sand, mud, and gravel substrates; intolerant of impoundment; broken bedrock and course gravel or sand in moderately flowing water; Colorado and Guadalupe River basins	No
Texas Pimpleback (Quadrula petrina)	С	-	Mud, gravel and sand substrates, generally in areas with slow flow rates; Colorado and Guadalupe river basins	No
Plants		T		
Big Red Sage (Salvia pentstemonoides)	-	-	Texas endemic; moist to seasonally wet, steep limestone outcrops on seeps within canyons or along creek banks; occasionally on clayey to silty soils of creek banks and terraces, in partial shade to full sun; basal leaves conspicuous for much of the year; flowering June-October	Yes – Areas along Salado Creek could provide suitable habitat

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Bracted Twistflower (Streptanthus bracteatus)	С	-	Texas endemic; shallow, well-drained gravelly clays and clay loams over limestone in oak juniper woodlands and associated openings, on steep to moderate slopes and in canyon bottoms; several known soils include Tarrant, Brackett, or Speck over Edwards, Glen Rose, and Walnut geologic formations	Yes – Areas along Salado Creek could provide suitable habitat
Buckley Tridens (Tridens buckleyanus)	-	-	Occurs in juniper-oak woodlands on rocky limestone slopes; perennial; flowering/fruiting April- November	No
Burridge Greenthread (Thelesperma burridgeanum)	-	-	Sandy open areas; annual; flowering March-November; fruiting March-June	No
Correll's False Dragon-Head (Physostegia correllii)	-	-	Wet, silty clay loams on streamsides, in creek beds, irrigation channels and roadside drainage ditches; or seepy, mucky, sometimes gravelly soils along riverbanks or small islands in the Rio Grande; or underlain by Austin Chalk limestone along gently flowing spring-fed creeks in central Texas; flowering May-September	Yes – Areas along Salado Creek could provide suitable habitat

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Elmendorf's Onion (Allium elmendorfii)	-	-	Texas endemic; grassland openings in oak woodlands on deep, loose, well-drained sands; in Coastal Bend, on Pleistocene barrier island ridges and Holocene Sand Sheet that support live oak woodlands; to the north it occurs in post oak-black hickory-live oak woodlands over Queen City and similar Eocene formations; one anomalous specimen found on Llano Uplift in wet pockets of granitic loam; perennial; flowering March-May	No
Glass Mountains Coral-Root (Hexalectris nitida)	-	SGCN	Apparently rare in mixed woodlands in canyons in the mountains of Brewster County, but encountered with regularity, albeit in small numbers, under Juniperus ashei in woodlands over limestone on the Edwards Plateau, Callahan Divide, and Lampasas Cutplain; perennial; flowering June-September; fruiting July-September	No
Gravelbar Brickellbush (Brickellia dentata)	-	-	Essentially restricted to frequently-scoured gravelly alluvial beds in creek and river bottoms; perennial; flowering June-November; fruiting June-October	No

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Hairy Sycamore- Leaf Snowbell (Styrax platanifolius var. stellatus)	-	-	Rare throughout range, in habitats similar to those of <i>S. var. platanifolius</i> – usually in oak-juniper woodlands on steep rocky banks and ledges along intermittent or perennial streams, rarely far from some reliable source of moisture; perennial; flowering April-October; fruiting May-September	No
Heller's Marbleseed (Onosmodium helleri)	-	-	Occurs in loamy calcareous soils in oak-juniper woodlands on rocky limestone slopes, often in more mesic portions of canyons; perennial; flowering March-May	No
Hill Country Wild- Mercury (Argythamnia aphoroides)	-	-	Texas endemic; mostly in bluestem-grama grasslands associated with plateau live oak woodlands on shallow to moderately deep clays and clay loams over limestone on rolling uplands, also in partial shade of oak-juniper woodlands in gravelly soils on rocky limestone slopes; perennial; flowering April-May with fruit persisting until mid-summer	Yes – Areas along Salado Creek could provide suitable habitat
Low Spurge (Euphorbia peplidion)	-	-	Occurs in a variety of vernally-moist situations in a number of natural regions; annual; flowering February-April; fruiting March-April	No

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Narrowleaf Brickellbush (Brickellia eupatorioides var. gracillima)	-	-	Moist to dry gravelly alluvial soils along riverbanks, but also on limestone slopes; perennial; flowering/fruiting April-November	No
Net-Leaf Bundleflower (Desmanthus reticulatus)	-	-	Mostly on clay prairies of the coastal plain of central and south Texas; perennial; flowering April-July; fruiting April-October	No
Osage Plains False Foxglove (Agalinis densiflora)	-	SGCN	Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; prairies, dry limestone soils; annual; flowering August-October	No
Parks' Jointweed (Polygonella parksii)	-	SGCN	Texas endemic; mostly found on deep, loose, whitish sand blowouts (unstable, deep, xeric, sandhill barrens) in Post Oak Savanna landscapes over the Carrizo and Sparta formations; also occurs in early successional grasslands, along right-of-ways, and on mechanically disturbed areas; flowering June-late October or September-November	No
Plateau Loosestrife (Lythrum ovalifolium)	-	-	Banks and gravelly beds of perennial (or strong intermittent) streams on the Edwards Plateau, Llano Uplift, and Lampasas Cutplain; perennial; flowering/fruiting April-November	No
Plateau Milkvine (Matelea edwardsensis)	-	-	Occurs in various types of juniper-oak and oak-juniper woodlands; perennial; flowering March-October; fruiting May-June	No

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Sandhill Woollywhite (Hymenopappus carrizoanus)	-	-	Texas endemic; disturbed or open areas in grasslands and post oak woodlands on deep sands derived from the Carrizo Sand and similar Eocene formations; flowering April-June	No
Siler's Huaco (Manfreda sileri)	-	-	Rare in a variety of grasslands and shrublands on dry sites; perennial; flowering April- July; fruiting June-July	No
Spreading Leastdaisy (Chaetopappa effuse)	-	-	Limestone cliffs, ledges, bluffs, steep hillsides, sometimes in seepy areas, oak-juniper, oak, or mixed deciduous woods, 300-500 m elevation; perennial; flowering (May) June-October	No
Sycamore-Leaf Snowbell (Styrax platanifolius species. Platanifolius)	-	-	Rare throughout range, usually in oak-juniper woodlands on steep rocky banks and ledges along intermittent or perennial streams, rarely far from some reliable source of moisture; perennial; flowering April-May; fruiting May-August	No
Texas Almond (Prunus minutiflora)	-	-	Wide-ranging but scarce, in a variety of grassland and shrubland situations, mostly on calcareous soils underlain by limestone, but occasionally in sandier neutral soils underlain by granite; perennial; flowering February-May and October; fruiting February-September	No

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Texas Amorpha (Amorpha roemeriana)	-	-	Juniper-oak woodlands or shrublands on rocky limestone slopes, sometimes on dry shelves above creeks; perennial; flowering May- June; fruiting June-October	No
Texas Fescue (Festuca versuta)	-	-	Occurs in mesic woodlands on limestone-derived soils on stream terraces and canyon slopes; perennial; flowering/fruiting April-June	No
Texas Peachbush ( <i>Prunus texana</i> )	-	SGCN	Occurs at scattered sites in various well drained sandy situations; deep sand, plains and sand hills, grasslands, oak woods, 0-200 m elevation; perennial; flowering February-March; fruiting April-June	No
Texas Seymeria (Seymeria texana)	-	-	Found primarily in grassy openings in juniper-oak woodlands on dry rocky slopes, but sometimes on rock outcrops in shaded canyons; annual; flowering May-November; fruiting July-November	No
Texas Wild-Rice ( <i>Zizania texana</i> )	E	SGCN	Headwaters of the San Marcos River; clear, flowing waters of spring origin with a relatively constant year-round temperature of 21-25 degrees Celsius	No
Tree Dodder (Cuscuta exaltata)	-	SGCN	Parasitic on various Quercus, Juglans, Rhus, Vitis, Ulmus, and Diospyros species as well as Acacia berlandieri and other woody plants; annual; flowering May-October; fruiting July-October	Yes – various tree species could act as a host for this species;

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?
Spot-Tailed Earless Lizard (Holbrookia lacerata)	-	-	Central and southern Texas and adjacent Mexico; moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eats small invertebrates; eggs laid underground	Yes – disturbed areas within study area provide suitable habitat
Texas Garter Snake (Thamnophis sirtalis annectens)	-	SGCN	Wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August	Yes – floodplain areas within the study area provide suitable habitat
Texas Horned Lizard (Phrynosoma cornutum)	-	T, SGCN	Open, arid, and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September	No
Texas Indigo Snake (Drymarchon melanurus erebennus)	-	Т	Texas south of the Guadalupe River and Balcones Escarpment; thornbush- chaparral woodlands of south Texas, in particular dense riparian corridors; can do well in suburban and irrigated croplands if not molested or indirectly poisoned; requires moist microhabitats, such as rodent burrows, for shelter	No

Species	Federal Status	State Status	Preferred Habitat	Potential Habitat in Study Area?	
Texas Tortoise (Gopherus berlandieri)	-	Open brush with a gunderstory is preferring grass and bare grous avoided; when inact occupies shallow destabase of bush or consometimes in under observed breeds April-Novem		No	
Timber Rattlesnake (Crotalus horridus)	-	T, SGCN	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto	No	

Source: USFWS, 2018a; TPWD, 2016

E = Endangered; T = Threatened; DL = Delisted; C = Candidate; SGCN = Species of Greatest Conservation Need

The Texas Natural Diversity Database (TXNDD) was reviewed on July 4, 2018 (date on which data were provided by the TPWD), to assess the potential for rare, threatened, or endangered species to occur within 1.5 miles of the study area. **Table 11** provides the elements of occurrence within 1.5 miles of the study area.

Table 11: Elements of Occurrence within 1.5 Miles of the Study Area

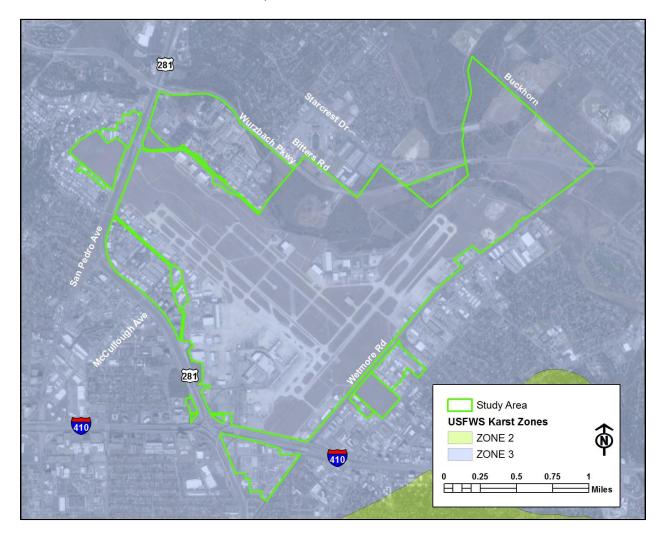
ID#	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
1595	Physostegia correllii	Correll's False Dragon- Head	G2	S2	-	-
12837	Spilogale gracilis	Western Spotted Skunk	G5	S5	-	-
12661	Spilogale putorius	Eastern Spotted Skunk	G4	S1S3	-	-

3387	Cicurina baronia	Robber Baron Cave Meshweaver	G1	S1	LE	-
2352	Texella cokendolpheri	Cokendolpher Cave Harvestman	G1	<b>S</b> 1	LE	-

Source: TPWD, 2018b

G1/S1 = Critically Imperiled; G2/S2 = Imperiled; G3/S3 = Vulnerable; G4/S4 = Apparently Secure; <math>G5/S5 = Secure

According to karst zone maps for the San Antonio area, the study area is located within Karst Zone 3, which is defined as areas (both cavernous and non-cavernous) that probably do not contain endangered karst invertebrate species (**Figure 11**). Previous studies have been conducted adjacent to and within the study area that identified karst features. TxDOT has informally consulted with federal agencies on projects located adjacent and within the ALP, which resulted in a "may affect, not likely to adversely affect" two arachnids (Madla's Cave Meshweaver and Robber Baron Cave meshweaver).

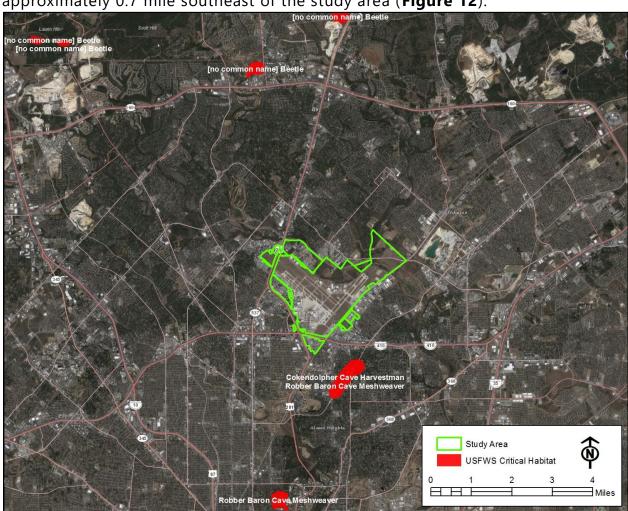


Source: U.S. Fish and Wildlife Service, Karst Zones.

# Figure 11: Karst Zones of the Study Area

According to the USFWS' Section 10(a)(1)(A) Scientific Permit Requirements for Conducting Presence/Absence Surveys for Endangered Karst Invertebrates in Central Texas (2015), a karst feature survey is required prior to ground-disturbing activities in Karst Zone 3 areas. Previous karst surveys within the study area may provide coverage for portions of the study area. Any areas that have not been previously surveyed for karst features would be surveyed during the project development process, if applicable.

Compliance with the Endangered Species Act (ESA) is required for projects that have the potential to impact federally-listed threatened or endangered species or their habitat. According to the USFWS' Critical Habitat Mapper (accessed July 10, 2018), a critical habitat unit for the Robber Baron Cave meshweaver (*Cicurina baronia*) and Cokendolpher Cave harvestman (*Texella cokendolpher*) is located



approximately 0.7 mile southeast of the study area (Figure 12).

Source: U.S. Fish and Wildlife Service, Threatened & Endangered Species Critical Habitat.

Figure 12: Critical Habitat Units within Proximity to the Study Area

### Federally-Listed Species

The study area was assessed for suitable habitat for federally-listed species (**Table 10**). According to this analysis, potential habitat could exist in the study area for the following federally-listed species.:

- Bracken Bat Cave Meshweaver (Cicurina venii) federal endangered species;
- Cokendolpher Cave Harvestman (Texella cokendolpher) federal endangered species;
- Government Canyon Bat Cave Meshweaver (*Cicurina vespera*) federal endangered species;
- Government Canyon Bat Cave Spider (*Neoleptoneta microps*) federal endangered species;
- Madla's Cave Meshweaver (Cicurina madla) federal endangered species;
- Robber Baron Cave Meshweaver (*Cicurina baronia*) federal endangered species;
- Beetle (Rhadine exilis) federal endangered species;
- Beetle (Rhadine infernalis) federal endangered species;
- Helotes Mold Beetle (Batrisodes venyivi) federal endangered species; and
- Bracted Twistflower (Streptanthus bracteatus) federal candidate species.

During future project development, if it is determined that the project has the potential to affect federally listed threatened, endangered, or candidate species or their critical habitat, coordination with the USFWS would be required. Coordination would assess avoidance measures or alternatives to the project, potential permitting requirements, and mitigation for unavoidable impacts.

#### **State-Listed Species**

In addition to evaluating the study area for potential suitable habitat for federally-listed species, evaluation of potential suitable habitat for state-listed species, Species of Greatest Conservation Need (SGCN), and other species considered rare by the State of Texas was identified (**Table 10**). According to this analysis, potential habitat for the following state-listed threatened, endangered, SGCN, and rare species may be present in the study area:

- Western Burrowing Owl (Athene cunicularia hypugaea) State rare species;
- Wood Stork (Mycteria americana) State threatened and SGCN species;
- Cave Myotis Bat (Myotis velifer) State SGCN species;
- Plains Spotted Skunk (Spilogale putorius interrupta) State rare species;
- Big Red Sage (Salvia pentstemonoides) State rare species;
- Correll's False Dragon-Head (Physostegia correllii) State rare species;

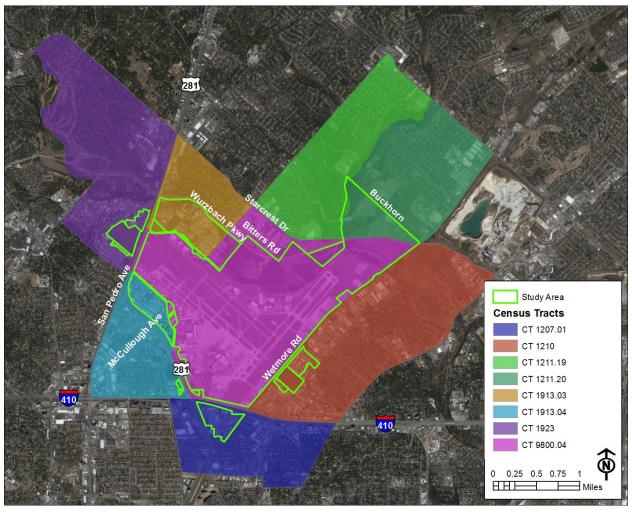
- Hill Country Wild-Mercury (Argythamnia aphoroides) State rare species
- Tree Dodder (Cuscuta exaltata) State SGCN species;
- Spot-Tailed Earless Lizard (Holbrookia lacerata) State rare species; and
- Texas Garter Snake (Thamnophis sirtalis annectens) State SGCN species.

Future activities with the potential to impact state-listed species or SGCN would comply with species-specific BMPs in coordination with the TPWD. During the appropriate stage of the project development process, potential impacts to protected species would be evaluated.

# 3.5 Socioeconomic Conditions and Demographics

The ALP is located within the north-central portion of Bexar County in the CoSA. The study area is located within the following 2017 U.S. Census geographies (**Figure 13**) comprised of Census Tracts (CT), Block Groups (BG), and Blocks:

- CT 1207.01, BG 1 (Blocks 1008, 1011-1012, 1023-1024, 1035, 1038-1040), BG 2 (Blocks 2008);
- CT 1210.00, BG 1 (Blocks 1001-1002, 1006);
- CT 1211.19, BG 3 (Block 3000);
- CT 1211.20, BG 1 (Blocks 1010, 1029-1030, 1032);
- CT 1913.03, BG 1 (Blocks 1008, 1013-1014, 1025-1028);
- CT 1913.04, BG 1 (Blocks 1000-1002, 1010, 1025, 1049), Block Group 2 (Blocks 2000-2001, 2013);
- CT 1923.00, BG 1 (Blocks 1015, 1017-1019); and
- CT 9800.04, BG 1 (Blocks 1000-1022, 1028-1035, 1043-1054).

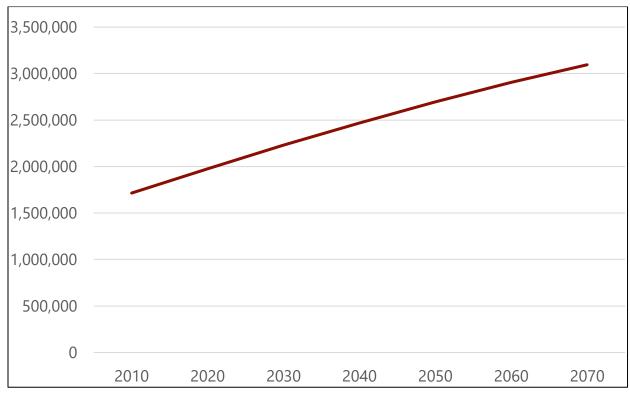


Source: U.S. Census Data.

Figure 13: 2017 U.S. Census Geographies

# 3.5.1 Regional Growth

As shown in **Figure 14**, at a county-level, the study area has experienced population growth in the past, and growth is expected to continue at a rate ranging from 0.01 to 0.02 percent per year into 2070.



Source: TWDB 2018

Figure 14: Regional Population Growth of Bexar County, 2010-2070

## 3.5.2 Environmental Justice Populations

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." DOT Order 5610.2(a), Environmental Justice in Minority and Low-Income Populations (May 10, 2012) summarizes the DOT's commitment to the principles of environmental justice and a strategy to integrate environmental justice into current policies and practices.

Disproportionately high and adverse human health or environmental effects are adverse effects that:

- Are predominantly borne by a minority population and/or a low-income population; or
- Will be suffered by the minority population and/or low-income population

and are appreciably more severe or greater in magnitude than the adverse effects that will be suffered by the non-minority population and/or low-income population.

# **Minority Populations**

A minority population is defined as a group of people and/or community experiencing common conditions of exposure or impact that consist of persons classified by the U.S. Census Bureau as Black/African American, Hispanic or Latino, Asian or Pacific Islander, American Indian, Eskimo or Aleut, or other non-white persons. More specifically, minority populations are defined as areas that contain 50 percent or more in minority persons.

According to the U.S. Census Bureau, the total population in the study area (blocks) was 1,750 persons in 2010. As shown in **Table 12**, the study area as a whole has a majority white population (52.9 percent). The minority population in the study area consists of approximately 47.1 percent of the total population and is predominantly Hispanic or Latino (40.3 percent), with Asian American persons (2.8 percent) being the second most prevalent.

Table 12: Racial and Ethnic Composition of the Study Area

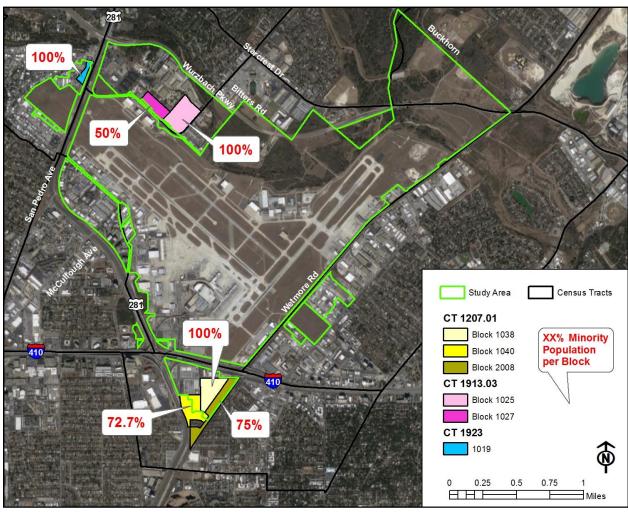
			Not His	panic or L	atino			
Census Geograp hy	Total Populati on	Black or African Americ an	Americ an Indian and Alaska Native	Asian Americ an	Pacific Island er	Othe r	Hispani c or Latino of any Race	Total Minority Populati on
Bexar County	1,714,77 3	118,46 0	3,809	39,561	1,806	25,05 6	1,006,9 58	1,195,65 0 69.73%
CT 1207.01	5,326	157	10	69	1	68	3,085	3,390 63.7%
BG 1	730	10	0	5	0	8	562	585 80.1%
Block 1038	1	1	0	0	0	0	0	1 100%
Block 1040	22	0	0	0	0	0	16	16 72.7%
BG 2	1414	58	3	13	0	24	1126	1224 86.6%
Block 2008	8	0	0	0	0	0	6	6 75%

			Not Hisp	panic or La	atino			
Census Geograp hy	Total Populati on	Black or African Americ an	Americ an Indian and Alaska Native	Asian Americ an	Pacific Island er	Othe r	Hispani c or Latino of any Race	Total Minority Populati on
CT 1210.00	7,095	384	17	100	32	119	3,341	3,993 56.3%
BG 1	619	52	0	8	0	15	354	429 69.3%
CT 1211.19	5,362	251	7	203	14	106	2,165	2,746 51.2%
BG 3	1,490	57	0	32	4	21	570	684 45.9%
Block 3000	622	24	0	20	0	8	245	297 47.7%
CT 1211.20	5,103	205	10	156	7	87	2,132	2,597 50.9%
BG 1	2,636	111	6	90	7	35	1164	1,413 53.6%
Block 1010	512	13	4	18	1	9	202	247 48.2%
CT 1913.03	1,561	37	3	29	2	17	620	708 46.2%
BG 1	1,561	37	3	29	2	17	620	708 46.2%
Block 1008	542	7	0	7	0	2	218	234 43.2%
Block 1025	6	0	0	0	0	0	6	6 100%
Block 1026	6	0	0	0	0	0	0	0 0%
Block 1027	8	1	0	0	0	0	3	4 50%
CT 1913.04	3,054	180	9	87	1	45	2,100	2,422 79.3%
BG 1	835	465	11	4	12	0	7	499 59.8%
BG 2	2,219	1635	169	5	75	1	38	1,923 86.7%
СТ	4,448	125	11	119	1	61	1,350	1,667

			Not Hisp	oanic or L	atino			
Census Geograp hy	Total Populati on	Black or African Americ an	Americ an Indian and Alaska Native	Asian Americ an	Pacific Island er	Othe r	Hispani c or Latino of any Race	Total Minority Populati on
1923.00								37.5%
BG 1	739	16	4	11	0	16	288	335 45.3%
Block 1015	14	0	1	4	0	0	0	5 35.7%
Block 1019	9	0	0	0	0	0	9	9 100%
Total Study Area (blocks)	1,750	46 2.6%	5 0.3%	49 2.8%	1 0.06%	19 1.1%	705 40.3%	825 47.1%

Source: U.S. Census Bureau 2010

Although the study area as a whole is not considered a minority population, there are minority populations located throughout the study area. Specific minority populations within the study area are depicted in **Figure 15**.



Source: U.S. Census Data

Figure 15: Minority Populations of the Study Area

### **Low-Income Populations**

Household income is used to identify the presence of low-income populations. According to the U.S. Census Bureau, a low-income population is defined as a group of people and/or community, which as a whole, live below the national poverty level.

According to 2012-2016 American Community Survey (ACS) data, the average household size within the study area (census tracts) is approximately three persons. According to the U.S. Department of Health and Human Services (HHS) 2018 poverty guidelines, a three-person household is considered low-income if they earn less than \$20,780 per year.

Table 13 shows the total number of households and median household income

for the study area at the census tract level. According to this data, there are 14,480 households in the study area. The median household income for these households is approximately \$67,506, which is well above the HHS 2018 poverty guideline for a family of three. There are no census tracts within the study area that have a median household income below the HHS 2018 poverty guideline.

Table 13: Median Household Income of the Study Area

Census Geography	Total Households	Median Household Income
Bexar County	623,321	\$52,353
CT 1207.01	2,209	\$33,680
CT 1210.00	2,874	\$51,006
CT 1211.19	2,241	\$54,332
CT 1211.20	1,996	\$57,677
CT 1913.03	1,953	\$105,580
CT 1913.04	1,115	\$108,808
CT 1923.00	2,092	\$85,521
Total Study Area (census tracts)	14,480	\$67,506

Source: U.S. Census Bureau 2016a, 2016b

### 3.5.3 Limited-English Proficiency Populations

EO 13166, Improving Access to Services for Persons with Limited English Proficiency, requires agencies to examine the services they provide, identify any need for services to those with limited-English proficiency (LEP), and develop and implement a system to provide those services so that LEP persons can have meaningful access to them.

The U.S. Department of Justice (DOJ) defines LEP individuals as those "who do not speak English as their primary language and who have a limited ability to read, write, speak, or understand English" (DOI, Undated).

In compliance with EO 13166 regarding LEP communities, the study area was assessed to determine if an LEP community exists. According to this analysis, there are persons (approximately 7.3 percent of the population over the age of five) that speak English "less than very well" in the study area (**Table 14**). Of the LEP population within the study area, approximately 94.7 percent of LEP individuals speak Spanish, approximately 2.7 percent speak other Indo-European languages, and approximately 2.6 percent speak Asian and Pacific Islander languages.

Table 14: Persons who Speak English "Less than Very Well" in the Study Area

Census Geography	Total Population (5 years and over)	Total Number who Speak English "Less than Very Well"	Percent LEP
Bexar County	1,723,161	211,279	12.3%
CT 1207.01	5,289	984	18.6%
CT 1210.00	7,187	387	5.4%
CT 1211.19	4,903	99	2.0%
CT 1211.20	5,090	241	4.7%
CT 1913.03	1,648	115	7.0%
CT 1913.04	2,052	387	18.9%
CT 1923.00	4,344	29	0.7%
Total Study Area	30,513	2,242	7.3%

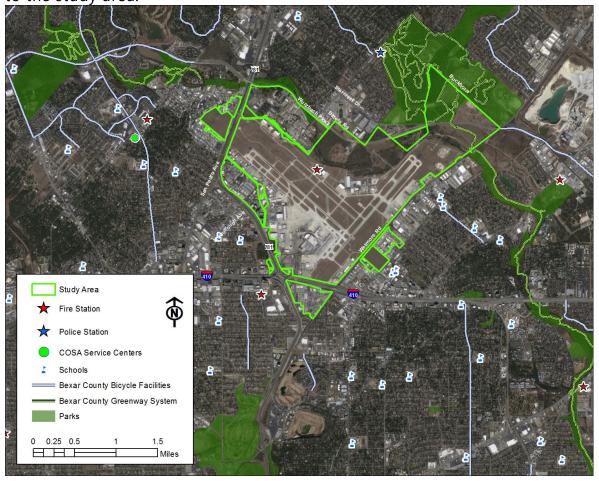
Source: U.S. Census Bureau 2016b

#### 3.5.4 Children's Environmental Health and Safety Risks

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires agencies to make it a priority to identify and assess environmental health risks that may disproportionately affect children. The four priorities identified for this EO as environmental health risks include asthma, unintentional injuries, developmental disorders (including lead poisoning), and cancer. The affected environment for these potential impacts are related to other impact categories such as air quality, noise, etc. According to the U.S. Census Bureau (2016d), the median age of the CoSA is approximately 33 years, with approximately 368,963 children under the age of 18 in households.

# 3.6 Community Resources

Community resources within and near the study area are discussed in the below sections. **Figure 16** shows the locations of these community facilities in relation to the study area.



Source: City of San Antonio, GIS Open Data Portal; Bexar County Appraisal District (BCAD); Alamo Area Metropolitan Planning Organization (AAMPO) Open Data Portal.

# Figure 16: Community Resources in the Vicinity of the Study Area<sup>2</sup>

#### 3.6.1 Schools

The study area is located within the Alamo Heights and North East Independent School Districts (ISDs). There are no schools located within the study area, but there are multiple schools within a one-mile radius (**Table 15**, **Figure 16**). Schools identified during this assessment include schools listed by the Texas Education Agency (TEA), including both public and private schools.

Table 15: Schools within One Mile of the Study Area

Name	District	Address	Grades	Proximity to Study
				Area
Academy of Creative Education	North East ISD	3736 Perrin Central, Building 2	9-12	0.2 mile
Basis	Basis Texas	8519 Floyd Curl Drive	K-5	0.5 mile
Churchill HS	North East ISD	12049 Blanco Road	9-12	0.9 mile
Coker ES	North East ISD	302 Heimer Road	PK-5	0.9 mile
Eisenhower MS	North East ISD	8231 Blanco Road	6-8	0.8 mile
Harmony Hills ES	North East ISD	10727 Memory Lane	PK-5	0.5 mile
Harris MS	North East ISD	5300 Knoll Creek	6-8	0.2 mile
Homebound	North East ISD	8961 Tesoro Drive	PK-12	0.1 mile
Howard ES	Alamo Heights ISD	7800 Broadway Street	PK-KG	0.8 mile
MacArthur HS	North East ISD	2923 MacArthur View	9-12	0.8 mile
Premier HS of San Antonio	Premier High Schools	4941 Walzem Road	6-12	0.3 mile
Regency Place ES	North East ISD	2635 Bitters Road	KG-5	0.4 mile
Ridgeview ES	North East ISD	8223 MCullough Avenue	PK-5	0.8 mile
Tuscany Heights ES	North East ISD	25001 Wilderness Oak	KG-5	0.2 mile

Source: TEA 2018

<sup>&</sup>lt;sup>2</sup> Note: Places of worship and other community facilities were identified via Google Earth and are not depicted in **Figure 16**.

# 3.6.2 Places of Worship

There is one place of worship, Oak Hills Church – North Central Campus (551 Nakoma Drive), located within the study area. There are numerous other places of worship within a one-mile radius, as summarized in **Table 16**.

Table 16: Places of Worship within One Mile of the Study Area

Name	Address	Proximity to Study  Area	
Within Study Area			
Oak Hills Church – North Central Campus	551 Nakoma Drive	Within	
Within One Mile of the Study Area	ı		
Lighthouse Baptist Church	10400 Broadway Street	0.3 mile	
St. Matthew's United Methodist Church	2738 MacArthur View	0.6 mile	
San Antonio Korean Baptist Church	2928 MacArthur View	0.8 mile	
Northeast Baptist Church	2930 MacArthur View	0.9 mile	
Place of Grace Fellowship	2938 Nacogdoches	0.9 mile	
Northeast Christian Church	2839 Woodbury Drive	0.6 mile	
MacArthur Park Luteran Church	2903 Nacogdoches	0.91 mile	
Child Evangelism Fellowship	9310 Broadway, Building 1	0.03 mile	
Resurgent	8134 Fredericksburg Road	0.03 mile	
Unity Church of San Antonio	1723 W. Lawndale Drive	0.43 mile	
St. Anthony of Padua Catholic Church	102 Lorenz Road	0.8 mile	
Missionary Servants-St. Anthony	100 Peter Baque Road	0.9 mile	
Alamo Heights United Methodist Church	825 Basse Road	1.0 mile	
San Antonio North Central	351 E. Ramsey Road	0.5 mile	
Shepherd King Lutheran Church	303 W. Ramsey	0.5 mile	
Highland Hills Baptist Church	707 McCarty Road	1.0 mile	
Holy Spirit Catholic Church	8134 Blanco Road	0.9 mile	
Coker United Methodist Church	231 E. North Loop Road	0.3 mile	
Shearer Hills Baptist Church	12615 San Pedro Avenue	0.2 mile	
Thousand Oaks Christian Church	13007 Jones Maltsberger Road	0.9 mile	
River City Community Church	16765 Lookout Road	0.7 mile	
First Assembly of God Church	13435 West Avenue	0.8 mile	

Name	Address	Proximity to Study Area	
Within Study Area			
Oak Hills Church – North Central	551 Nakoma Drive	Within	
Campus	331 Nakollia Dlive	VVILIIII	
Within One Mile of the Study Area			
Redeemer's Hope Church	12475 Starcrest Drive	0.4 mile	
Mommy's Freedom by the Hour	11825 West Avenue	0.6 mile	

Source: Google Earth 2018

# 3.6.3 Other Community Facilities

Other community facilities within the study area include a government office (Comptroller of the Currency, 10001 Reunion Place #250), a hospital (Leukemia and Lymphoma Society (1218 Arion Parkway), and a post office (10250 John Saunders Road). **Table 17** summarizes other community facilities located within a one-mile radius of the study area. Community facility types researched for this assessment included community fire stations, police stations, post offices, hospitals, libraries, government buildings, and other community centers.

Table 17: Community Facilities within One Mile of the Study Area

Table 17. Communic	y racintles within	n One wille of the 3	ituuy Aiea
Name	Туре	Address	Proximity to Study Area
Within the Study Area			
Comptroller of the Currency	Government Office	10001 Reunion Place #250	Within
Leukemia and Lymphoma Society	Hospital	1218 Arion Parkway	Within
United States Postal Service	Post Office	10250 John Saunders Road	Within
Within One Mile of the	Study Area		
Fire Station #17	Fire Station	8545 Jones Maltsberger	0.3 miles
Fire Station #23	Fire Station	1750 Skyplace Boulevard	
Fire Station #31	Fire Station	11802 West Avenue	0.6 miles
Fire Station #39	Fire Station	10750 Nacogdoches Road	0.9 miles
Senator Jeff Wentworth	Government Office	1250 NE Interstate 410 Loop #925	0.8 mile
Representative Lamar Smith	Government Office	1100 NE Interstate 410 Loop #640	0.5 mile
Bexar County Constable	Government Office	8918 Tesoro Drive #301	0.3 mile
Victor J Ferrari Family Center	Government Office	107 W. Rampart Drive	0.9 mile
Valley View Community Link Service	Government Office	8523 Blanco Road	0.8 mile
North San Antonio Chamber of Commerce	Government Office	12930 Country Parkway	0.2 mile
Christus Santa Rosa Hospital	Hospital	403 Treeline Park	0.5 mile
To Pee or Not to Pee	Hospital	147 W. Sunset Road	0.6 mile
ADHD Clinic San Antonio	Hospital	13535 Jones Maltsberger Road	0.6 mile
Balcones Energy Log Library	Library	2206 Danbury Street	0.01 mile
Texas Transportation Museum	Museum	11731 Wetmore Road	0.14 mile
Police Sub-Station North	Police Station	13030 Jones Maltsberger Road	0.6 miles

United States Postal Service	Post Office	9211 Broadway Street	0.06 mile
U.S. Post Office Annex	Post Office	10330 Desert Sand Street	0.1 mile

Source: Google Earth 2018

#### 3.6.4 Parks and Recreation Areas

Desktop review identified two parks or recreational areas within the study area and additional parks or recreational areas in the vicinity of the airport, as summarized in **Table 18** and **Figure 16**. The majority of the parks and recreational areas listed in **Table 18** are owned by either the CoSA or Bexar County.

Table 18: Parks and Recreational Facilities within One Mile of the Study Area

Study Area		
Name	Ownership	Address
Within Study Area		
McAllister Park	Public, CoSA	13102 Jones-Maltsberger
Salado Creek Greenway North	Public, CoSA	Blanco Road to McAllister Park
Within One Mile of the Stud	ly Area	
Walker Ranch Park	Public, CoSA	12603 West Avenue
Olmos Basin Golf Course	Private, Alamo City Golf Trail	7022 McCullough Avenue
Northridge Park	Public, CoSA	821 Chevy Chase Drive
Haskin Park	Public, CoSA	200 Haskin Drive
MacArthur Park	Public, Bexar County	1611 NE Interstate 410 Loop
Lady Bird Johnson Park	Public, CoSA	10700 Nacogdoches Road
Lorence Creek Park	Public, CoSA	2506 Moss Bluff
Blossom Athletic Center	Public, North East ISD	12002 Jones Maltsberger Road
North East Sports Park	Public, North East ISD	12001 Wetmore Road
Classics Elite Soccer Academy	Private, Classic Elite Soccer Academy	1600 E Bitters Road
Alamo Heights Tennis Center	Public, Alamo Heights ISD	705 Trafalgar Road
Hamilton Community Center	Public, CoSA	10700 Nacogdoches Road

Source: COSA 2018a, Bexar County 2018

# 3.6.5 Ports of Entry

There is one international port-of-entry (POE) located within Bexar County – the Port San Antonio POE. However, this POE is located outside of the study area.

# 3.7 Cultural Resources

"Cultural resources" is a general term referring to buildings, structures, objects, sites, and districts of more than 50 years of age with the potential to have significance in local, state, or national history. Archaeological resources are those material remains of past human existence of archaeological interest. Historic resources refer to any site, district, object, building, or structure that is primarily non-archaeological in nature.

Cultural resources, including archaeological, historical, architectural sites, and traditional cultural properties located on land owned or controlled by the State of Texas or one of its cities or counties or other political subdivisions, are protected by the Antiquities Code of Texas (ACT) (Title 9, Chapter 191 of the Texas Natural Resources Code of 1977). Under this code, any historic or prehistoric property located on publicly-owned land may be determined eligible as a State Antiquities Landmark (SAL). Conditions for formal landmark designation are covered in Chapter 26 of the Texas Historical Commission's (THC) *Rules of Practice and Procedure for the Antiquities Code of Texas*. All groundbreaking activities affecting public land must be authorized by the THC's Department of Antiquities Protection. Authorization includes a formal Antiquities Permit, which stipulates the conditions under which survey, discovery, excavation, demolition, restoration, or scientific investigations would occur.

In addition to compliance with the ACT, any significant cultural resources present in the project's Area of Potential Effects (APE) would need to be considered under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the NEPA of 1969. Section 106 of the NHPA and NEPA requires federal agencies to consider the effects of proposed undertakings on traditional cultural properties. Traditional cultural properties can be districts, buildings, structures, objects, cemeteries, or archaeological sites eligible for inclusion in the National Register of Historic Places (NRHP).

In accordance with 36 CFR Part 800, *Protection of Historic Properties*, Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on historic properties, and also to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the said undertakings. Under the Section 106 process, consultation between the federal agency official and interested parties should occur at the project planning stages to address the potential effects of the undertaking on historic properties. If an effect is determined to be adverse, steps must be taken to avoid, minimize, and/or mitigate the adverse effect. Section 106 of the NHPA also requires that federal agencies consult with federally-recognized American Indian tribes regarding the proposed undertaking.

The consultation process of identification, evaluation, and assessment used to address the requirements of Section 106 of the NHPA is found in the FAA 1050.1F *Desk Reference*.

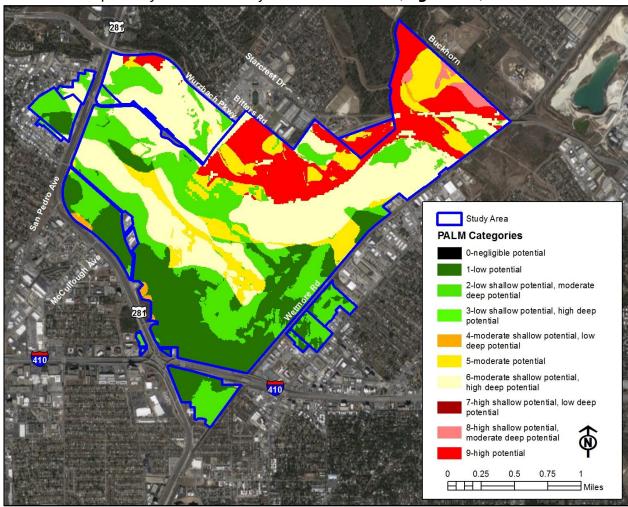
# 3.7.1 Archaeological Resources

Existing archaeological resources within the study area were identified based on a data search of the Texas Archaeological Sites Atlas (Atlas) maintained by the THC and the Texas Archaeological Research Laboratory (TARL). This search was conducted to identify previously recorded cemeteries, historical markers, NRHP properties or districts, SALs, archaeological sites, or other cultural resources in or near the study area.

Based on previous survey coverage data available in the Atlas, an estimated 15 to 20 percent of the study area has been previously surveyed, primarily in the northern portions near Salado Creek. However, not all areas near Salado Creek within the study area have been surveyed. These surveys identified three previously recorded archaeological sites within the study area, as well as six additional sites within 1 kilometer (km) (0.62 mile) of the study area. The three previously recorded sites within the study area are summarized below.

- 41BX947 is a prehistoric site located at the extreme northern edge of the airport property, east of where US 281 crosses Panther Springs Creek. The site was estimated to be approximately 100 meters (328.1 feet) by 150 meters (492.1 feet). The site was recorded in 1991 and was determined in 2009 to be not eligible to the NRHP within the study area.
- 41BX949 is a prehistoric site located at the northern edge of the airport property, south of New Bitters Road. The site area was estimated to be approximately 200 meters (656.2 feet) by 200 meters (656.2 feet). The site was recorded in 1991 and was determined in 2009 to be not eligible to the NRHP within the study area.
- 41BX1927 is a prehistoric lithic quarry site located between Salado Creek and the SAT runways. The site area was estimated to be approximately 120 meters (393.7 feet) by 5 meters (16.4 feet). In 2012, the site was recorded and was determined to be not eligible to the NRHP.

Review of soil maps and the Texas Department of Transportation's (TxDOT) Potential Archaeological Liability Map (PALM) suggests that portions of the study area, if undisturbed, contain a high potential for buried prehistoric archeological resources, especially in the vicinity of Salado Creek (**Figure 17**).



Source: Texas Department of Transportation, Potential Archeological Liability Maps (PALM).

# Figure 17: Potential Archaeological Liability Map of the Study Area

In accordance with the NHPA and ACT, potential project effects on archaeological sites would be considered during project development.

#### 3.7.2 Cemeteries

The Health and Safety Code prohibits the use of cemetery property for non-cemetery purposes. No known cemeteries are located within the study area. The closest cemetery to the study area is Coker Cemetery, which is located behind

Coker United Methodist Church located at 231 E. North Loop Road, approximately 0.4-mile northwest of the study area.

#### 3.7.3 Historic Resources

The study area is not located within a CoSA-designated historic district and does not contain a CoSA-designated historic landmark site (CoSA 2016; CoSA 2018b). Furthermore, based on an online search of the THC's Texas Historic Sites Atlas, there are no NRHP properties, NRHP districts, or State of Texas historical markers within or adjacent to the study area (THC 2018). Previous historic surveys have been conducted adjacent to and within the study area; these surveys did not identify any properties eligible for the NRHP.

#### 3.7.4 Tribal Consultation

Federally-recognized Indian tribes and Tribal Historic Preservation Officers (THPOs) are entitled to participate in Section 106 reviews. There are seven federally-recognized Indian tribes that have an interest in projects located in Bexar County, including:

- (1) Alabama-Coushatta Tribe of Texas;
- (2) Apache Tribe of Oklahoma;
- (3) Comanche Nation, Oklahoma;
- (4) Coushatta Tribe of Louisiana;
- (5) Mescalero Apache Tribe of the Mescalero Reservation, New Mexico;
- (6) Tonkawa Tribe of Indians of Oklahoma; and
- (7) Wichita and Affiliated Tribes (Wichita, Keechi, Waco, and Tawakonie), Oklahoma.

Tribal consultation would take place during future project development.

# 3.8 Section 4(f), Section 6(f), and Chapter 26 Properties

# 3.8.1 Section 4(f) Properties

Section 4(f) of the 1966 DOT Act is codified in 23 USC 138 and 49 USC 303. The act requires special consideration to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The statute also requires DOT to seek comments from the Official(s) with Jurisdiction (OWJ) over the resource, and in some cases, to consult with the DOI and other federal agencies before making any decisions (49 USC 303(a), (b)). According to 1050.1F *Desk Reference*, the FAA is bound by the requirements of the Section 4(f) regulation but may use the FHWA/FTA regulations and FHWA guidance to the extent relevant to aviation projects.

A Section 4(f) property is any significant publicly-owned park, recreation area, wildlife and waterfowl refuge, or public or private historic property (including archaeological sites) protected by 23 CFR 774. There are two known Section 4(f) properties within the study area, including the following publicly-owned parks and recreation areas: McAllister Park and Salado Creek Greenway North. There are no TPWD Wildlife Management Areas (WMAs) or USFWS wildlife refuges within the study area that would be subject to Section 4(f). Although there are three previously recorded archaeological sites in the study area (see **Section 3.7.1**), these were determined to be not eligible to the NRHP and are therefore not considered Section 4(f) properties.

There are additional Section 4(f) resources within SAT's noise contours, including nearby public parks (see **Section 3.6.4**). Special consideration should be given to the evaluation of the significance of noise impacts within Section 4(f) properties.

During project development, SAT would ensure compliance with Section 4(f) of the DOT.

### 3.8.2 Section 6(f) Properties

The Land and Water Conservation Fund Act (LWCF) of 1965 established a funding source assisting states and federal agencies to meet present and future outdoor recreation demands and needs. Section 6(f)(3), as codified in 36 CFR 59.3, is the cornerstone of federal efforts to ensure that the federal investments in LWCF assistance are being maintained for public outdoor recreation use. Federal assistance from the LWCF is allocated to a state for the planning, acquisition, and/or development of needed land and water public outdoor recreation projects.

Once land has been purchased or developed (partially or entirely) with LWCF assistance, it is considered a Section 6(f) property, and no Section 6(f) property shall be wholly or partly converted to a use other than public outdoor recreation uses without the approval of the National Park Service (NPS). In other words, Section 6(f) properties must be used for public recreation, unless the NPS approves the substitution of a replacement property, which must be substituted at a 1:1 ratio in terms of fair market value and usefulness in comparison to the converted/used land. Approval to convert a Section 6(f) property to a non-recreational use is rarely granted, and it requires extensive compliance activities and documentation.

There are no Section 6(f) properties within the study area.

## 3.8.3 Chapter 26 Properties

The Parks and Wildlife Code (PWC), Title 3, Chapter 26, similar to Section 4(f) of the DOT Act, requires the FAA to make specific findings before approving the use of certain kinds of public lands for an aviation project. Chapter 26 applies whenever FAA proposes to use or take any public land designated and used as a park, recreation area, scientific area, wildlife refuge, or historic site. While Chapter 26 is similar to Section 4(f), there are differences. Whereas Section 4(f) applies only to land of historic sites of "national, state, or local significance", Chapter 26 applies to public land designated and used as a historic site regardless of its significance.

As discussed in **Section 3.6.4**, there are two publicly-owned parks or recreation areas within the study area: McAllister Park and Salado Creek Greenway North. Future projects that may impact these areas would require Chapter 26 compliance. There are two requirements for complying with Chapter 26: (1) public involvement, and (2) determinations. Public involvement requirements include providing public notice and holding a public hearing. After the public hearing, FAA must make the following two determinations before approving the use of a property protected by Chapter 26:

- There is no feasible and prudent alternative to the use or taking of such land; and
- The program or project includes all reasonable planning to minimize harm to the land as a park, recreation area, scientific area, wildlife refuge, or historic site, resulting from the use or taking.

# 3.9 Noise Sensitive Land Uses/Receptors

In accordance with Title 14 CFR Part 150, Airport Noise Compatibility Planning, SAT developed a Noise Compatibility Program (NCP) that describes current and future non-compatible land uses in the study area, which was first submitted in 1990. Amendments and approvals since then are described in the most recent Record of Approval from the FAA for the SAT 14 CFR Part 150 NCP Update with an approval date of June 2015 (FAA 2015).

Noise Exposure Maps (NEMs) submitted for SAT in 2014 were approved by the FAA and published in the Federal Register on January 22, 2015. Following the approval of the NEMs, the NCP was updated to reflect changes in operational activity level and aircraft fleet mix, which in turn affected the NEMs. The 2015 NCP update consists of program measures approved in previous NCPs and revised measures for approval. SAT has implemented the Residential Acoustical Treatment Program (RATP) to insulate residential structures to mitigate aircraft noise. SAT has also implemented a program to insulate non-residential structures located in the Day-Night Average Sound Level (DNL) exceeding 65 decibels (dB). Other airport noise programs include: land use study project, SAT runway use, noise and operations monitoring system, noise abatement departure profiles, ground run-up enclosure, newer quieter aircraft, pilot awareness program, and airport awareness zone.

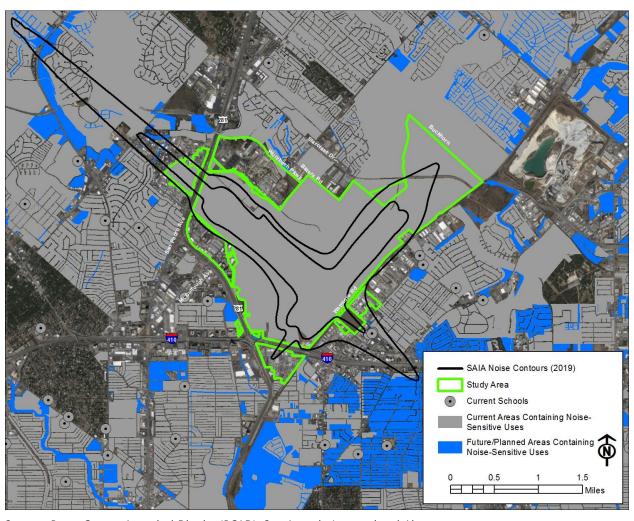
Of the 2,896-acre study area, on-airport land use includes airfield operations, terminal areas, support facilities, general aviation, aircraft manufacturing, aircraft maintenance, ground transportation, air cargo, and vacant/open space. Offairport land uses include residential, commercial, industrial, institutional, recreational, and vacant/open space.

Current noise sensitive land uses/receptors in the study area vicinity include parks, schools, potential historic districts or places, and current residential zoning areas, as shown on **Figure 18**. Future noise sensitive land uses/receptors include the future land use plans and master development plans that include residential lands in the respective plans/zoning, as shown on **Figure 19**. The noise contours shown on these figures represent the computer-modeled DNL contour estimates depicted in terms of equal-exposure 65, 70, and 75 dB noise contours. Noise contours on Figures 18 and 19 are derived from Noise Exposure Map Update Noise Compatibility Program Revision, SAIA, December 2014, PDF page 7. The interior

65 dB contour is within the existing airport boundary.<sup>3</sup>

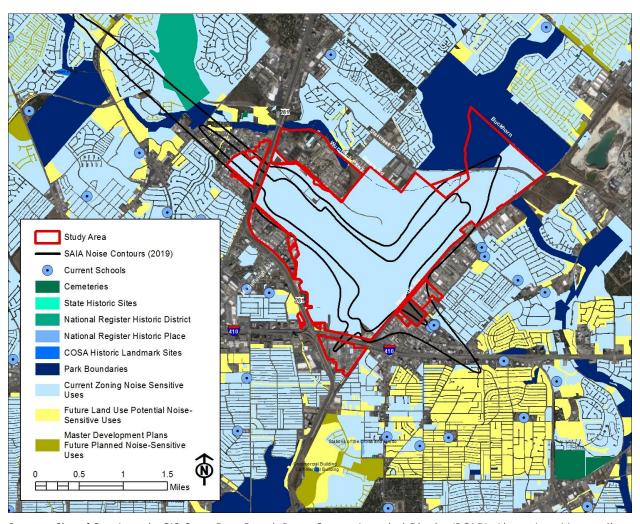
The FAA, other federal agencies, and several states have used information on community reaction to noise to create guidelines for identifying land uses that are compatible with particular noise exposure levels. All identified land uses are normally compatible with aircraft noise at DNL levels below 65 dB DNL.<sup>4</sup>

**Table 19** depicts land use compatibility per average sound levels.



Source: Bexar County Appraisal District (BCAD); San Antonio International Airport.

Figure 18: Current Noise Sensitive Land Uses/Receptors



Source: City of San Antonio GIS Open Data Portal; Bexar County Appraisal District (BCAD); Alamo Area Metropolitan Planning Organziation (AAMPO) Open Data Portal; Texas Education Agency GIS Data; Texas Historical Commission GIS Data; San Antonio International Airport Noise Exposure Map Update (2014).

Figure 19: Future Noise Sensitive Land Uses/Receptors

Table 19: Land Use Compatibility per Average Sound Levels

	Yearly DNL Sound Level (decibels					
Land Use	<65	65-70	70- 75	75- 80	80-85	>80
Residential						
Residential, other than mobile homes and	Υ	N1 (1)	NI (1)	N.I	N	N.I.
transient lodgings	Y	N (1)	N (1)	N	IN	N
Mobile home parks	Υ	N	N	N	N	N
Transient lodgings	Υ	N (1)	N (1)	N (1)	N	N
Public Use						
Schools	Υ	N (1)	N (1)	N	N	N
Hospitals and nursing homes	Υ	25	30	Ν	N	N
Churches, auditoriums, and concert halls	Υ	25	30	N	N	N
Governmental services	Υ	Υ	25	30	N	N
Transportation	Υ	Υ	Y (2)	Y (3)	Y (4)	Y (4)
Parking	Υ	Υ	Y (2)	Y (3)	Y (4)	N
Commercial Use						
Offices, business and professional	Υ	Υ	25	30	N	N
Wholesale and retail – building materials,	Υ	Υ	Y (2)	Y (3)	Y (4)	N
hardware, and farm equipment						
Retail trade, general	Y	Υ	25	30	N	N
Utilities	Y	Υ	Y (2)	Y (3)	Y (4)	N
Communication	Υ	Υ	25	30	N	N
Manufacturing and Production		T			I	
Manufacturing, general	Υ	Y	Y (2)	Y (3)	Y (4)	N
Photographic and optical	Υ	Υ	25	30	N	N
Agriculture (except livestock) and forestry	Υ	Y (6)	Y (7)	Y (8)	Y (8)	Y (8)
Livestock farming and breeding	Υ	Y (6)	Y (7)	N	N	N
Mining and fishing, resource production and extraction	Υ	Υ	Υ	Υ	Υ	Υ
Recreational						
Outdoor sports arenas and spectator sports	Υ	Y (5)	Y (5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	 Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	 Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Source: 14 CFR part 150, Appendix A, Table 1

FAA, 1050.1F Desk Reference, Chapter 11. Noise and Noise-Compatible Land Use, July 2015, page 11-17

Note: Numbers in parentheses refer to the notes below.

\* The designations contained in this exhibit do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. The FAA determinations under 14 CFR part 150 are not intended to substitute Federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Y = Land use and related structures compatible without restrictions

N = Land use and related structures are not compatible and should be prohibited

25 or 30 = Land use and related structures generally compatible; measures to achieve Noise Level Reduction of 25 or 30 dBA (i.e. a weighted sound level) must be incorporated into design and construction of structure. Noise Level Reduction is the amount of noise reduction in decibels achieved through incorporation of building sound insulation treatments (between outdoor and indoor levels) in the design and construction of a structure (14 CFR § 150.7). Building sound insulation treatments typically consist of acoustical replacement windows and doors.

- (1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor noise level reduction of at least 25 dBA and 30 dBA should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a noise level reduction of 20 dBA, thus, the reduction requirements are often stated as 5, 10 or 15 dBA over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of noise level reduction criteria will not eliminate outdoor noise problems.
- (2) Measures to achieve noise level reduction of 25 dBA 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 noise level reduction of 30 dBA 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 noise level reduction of 35 dBA 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) Land use compatible provided special sound reinforcement systems are installed.
- (6) Residential buildings require noise level reduction of 25 dBA.
- (7) Residential buildings require noise level reduction of 30 dBA.
- (8) Residential buildings not permitted.

# 4 Summary

The purpose of this report is to provide an inventory of sensitive environmental resources within the SAT study area in support of airport master planning. **Table 20** provides a summary of the existing environmental resources in the study area or extended resource area, where applicable. Once alternatives are developed, the environmental inventory would assist with the environmental overview which "may provide the information necessary to: 1) determine if additional alternatives are needed to avoid or minimize the impact of the project to sensitive environmental

features; 2) define future environmental coordination and analysis work to develop more thorough work scope for an EA or EIS and; 3) properly understand the anticipated costs of preliminary/final design as well as how best to estimate the cost of and schedule for the NEPA process" (Appendix D 3.b). Once Phase I is completed, the Phase II report will provide potential environmental consequences of the proposed alternatives on the existing environment.

**Table 20: Environmental Constraints of the Study Area** 

	ivironmental Constraints of the Study Area		
Resource	Existing Constraints Within the Study Area		
Air Quality	<ul> <li>General conformity applicable due to designation of Bexar County as the San Antonio, TX non-attainment area for ozone (effective September 24, 2018)</li> </ul>		
Aquatic Resources	<ul> <li>Salado Creek and two tributaries, Lorence Creek Mud Creek, and a tributary to Olmos Creek within study area</li> <li>One NWI wetland in study area</li> <li>100-year floodplain areas within study area</li> <li>Study area within five miles upstream and draining into two threatened/impaired waters (Salado Creek, Upper San Antonio River)</li> </ul>		
Hazardous Materials and Soils	<ul> <li>Nine historical LPST sites with groundwater contamination are located within the study area</li> <li>Fertilizer/Pesticide contamination site located adjacent to the study area</li> <li>Seven landfill facilities (1 operating, 6 closed) are located within the study area</li> <li>Exempt from the requirements of the FPPA and coordination with the NRCS is not required</li> </ul>		
Biological Resources	<ul> <li>No rare or protected vegetation</li> <li>Migratory birds may be present in study area</li> <li>Located within Karst Zone 3</li> <li>Potential habitat for nine federally-endangered karst species (Bracken Bat Cave meshweaver, Cokendolpher Cave harvestman, Government Canyon bat cave meshweaver, Government Canyon bat cave spider, Madla's Cave meshweaver, Robber Baron Cave meshweaver, Rhadine exilis, Rhadine infernalis, Helotes mold beetle); initial karst features survey required to identify potential habitat.</li> <li>Potential habitat for one federal candidate plant species (bracted twistflower)</li> <li>Potential habitat for one state-threatened species (wood stork), three state SGCN species (cave myotis bat, tree dodder, Texas garter snake), and six state rare species (western burrowing owl, plains spotted skunk, Big red sage, Correll's false dragonhead, Hill Country wild-mercury, spot-tailed earless lizard)</li> </ul>		
Socioeconomic Conditions and Demographics	<ul> <li>Portions of study area are considered minority populations</li> <li>Approximately 7.3 percent of study area consists of LER</li> </ul>		

Resource	Existing Constraints Within the Study Area	
Community Resources	<ul> <li>1 fire station within the study area</li> <li>2 parks within the study area</li> <li>Multiple schools, places of worship, parks, and other community facilities within one mile of the study area</li> </ul>	
<ul> <li>Portions of study area contain a high potential for buried prehistoric archaeological resources, especi near Salado Creek</li> </ul>		
Section 4(f), Section 6(f), and Chapter 26 Properties	<ul> <li>Two Section 4(f)/Chapter 26 properties within study area (McAllister Park and Salado Creek Greenway North)</li> </ul>	
Noise Sensitive Land Uses/Receptors	<ul> <li>Detailed review will occur during the master planning process of alternatives that could have a long-term effect on noise exposure.</li> </ul>	

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# San Antonio Airport System Strategic Development Plan

# 2021 AIRPORT MASTER PLAN

MASTER PLAN UPDATE
CHAPTER 2 – INVENTORY OF EXISTING CONDITIONS
APPENDIX 2G – RECYCLING MEMORANDUM







#### **MEMO**

**TO:** San Antonio International Airport

FROM: WSP USA, Inc.

SUBJECT: San Antonio International Airport Recycling Plan Comparison

**DATE:** November 19, 2018

The San Antonio International Airport (SAT) currently does not have an existing recycling plan for comparison to federal, state, and local guidance and industry best practices. The following documents, though, do incorporate information regarding recycling at SAT.

- Airport Rules and Regulations (San Antonio Airport System [SAAS] 2015)
- Vision 2050: Final Technical Report (SAAS 2010)
- Sustainability Plan (SAT 2011)

Portions of the existing documentation could be used to develop a comprehensive recycling plan that follows Federal Aviation Administration (FAA) guidance. In addition, creating a recycling plan would require adherence to state and local regulations. Utilizing lessons learns and industry best practices would also help in creating a comprehensive recycling plan. The following section summarizes the requirements outlined in available FAA guidance.

#### FAA Modernization and Reform Act of 2012<sup>1</sup>

The FAA Modernization and Reform Act of 2012 (FMRA) amended Title 49 of the United States Code (USC), including Subtitle VIII, Part B, Chapter 471, which specifically relates to airport planning. Section 132. Recycling Plans for Airports of the Act included the development of a recycling plan and "minimizing the generation of airport solid waste" in the definition of airport planning. In addition, Section 133. Recycling Plans for Airports of the Act laid out five criteria that recycling plans must meet including: recycling feasibility; waste minimization; operations and maintenance requirements; waste management contract review; and "the potential for cost savings or the generation of revenue".

#### Guidance on Airport Recycling, Reuse, and Waste Reductions Plans (FAA 2014)<sup>2</sup>

This memorandum provides direction on the development of recycling plans as mandated by FMRA. The guidance states that recycling plans are required for all "federally-obligated airports" and provides guidance on how to discuss the five recycling plan criteria outlined in the FRMA. The guidance describes the types of waste generated at airports and notes that different factors of airports, such as size and layout, may affect the scope of recycling plans and programs. Most importantly, the guidance describes the sections that must be included in an airport's recycling plan, which are noted below.

- Facility Description and Background
  - (1) Background information

<sup>&</sup>lt;sup>1</sup> United States. (2012). FAA Modernization and Reform Act of 2012. https://www.gpo.gov/fdsys/pkg/STATUTE-117/pdf/STATUTE-117-Pg2490.pdf#page=14

<sup>&</sup>lt;sup>2</sup> Federal Aviation Administration. (2014). *Guidance on Airport Recycling, Reuse, and Waste Reductions Plans*. https://www.faa.gov/airports/environmental/media/airport-recycling-reuse-waste-reduction-plans-guidance.pdf



- (2) Scope of existing recycling program
- (3) Current waste management program and its' coordination with the local municipality's waste management program
- (4) "Drivers for implementing/maintaining a recycling program"
- (5) Description/inventory of airport recycling infrastructure
- (6) Description of current efforts in recycling, reuse, and waste reduction
- (7) Performance of current program including goals and metrics
- Waste Audit
  - (1) Annual metrics for municipal solid waste as well as construction and demolition waste
  - (2) Waste sources/activities
  - (3) Waste generators (e.g. owners and facilities/areas)
- Review of recycling feasibility
  - (1) Technical/economic factors affecting ability to recycle
  - (2) Relationship between federal, state, and local guidelines and policies and ability to recycle
  - (3) Incentives for implementing and maintaining a program
  - (4) Logistical constraints
- Operations and Maintenance requirements
- Review of waste management contracts
  - (1) Current contracting
  - (2) Existing contracts ability to encourage/hinder purchase of "environmentally-preferred products"
  - (3) Correlation between tenant leases and service contracts as opportunities to implement program
  - (4) Funding for existing waste management and recycling
- Potential for cost savings or revenue generation (financial analysis)
- Plan to minimize solid waste generation
  - (1) Plan for recycling paper, plastic bottles, aluminum cans, and plastic cups
  - (2) "Comprehensive approach" with goals/objectives for reducing landfill waste
  - (3) Other factors for consideration
  - (4) Any need for capital improvements
  - (5) Recommendations that may conflict with existing plans/programs
  - (6) Recycling during new developments/construction
  - (7) Tracking/reporting on recommendations
  - (8) Program enhancements considered for the future
  - (9) Conditions for reevaluating identified constraints
  - (10) Outreach/education of employees, tenants, and traveling public

#### Recycling, Reuse and Waste Reduction at Airports (FAA 2013)

The document notes seven general categories of waste that airports typically generate, including the following:

- Municipal solid waste
- Construction and demolition waste
- Green (vegetation) waste
- Food waste
- Aircraft flight waste
- Lavatory waste
- Spill cleanup and remediation waste
- Hazardous materials

The document provides locations where waste is typically found in airports including terminals, airfields, aircraft maintenance hangars, cargo hangars, flight kitchens, offices, and construction projects. It also provides strategies on creating airport recycling programs and case studies of best practices. The strategies are summarized in a ten-step process listed below.

- Commitment from management
- Program leadership/designated coordinator



- Waste identification/audit
- Waste collection and hauler
- Waste management plan development
- Education and outreach
- Monitor and refine
- Performance monitoring
- Promote success
- Continuous improvements

The document also provides frequently encountered challenges to creating and implementing a recycling plan. Some of these challenges include lack of incentives for recycling, number of entities, and vendor's leasing language.

The FAA guidance and documentation referenced above were used to determine whether the Airport's existing documents referencing recycling and waste management adhered to the standards set forth in the guidance and followed best industry practices established by other airports. Industry best practices were determined through a review of several documents, including other airports recycling plans. The *References* section notes all documents that were reviewed.

#### **GUIDANCE**

#### **EXISTING SAT ADHERENCE**

Guidance on Airport Recycling, Reuse, and Waste Reductions Plans (FAA 2014)	SAT currently does not have a recycling plan or other plan that addresses the requirements outlined in the guideline.
Recycling, Reuse and Waste Reduction at Airports	SAT currently identifies types of waste through its waste removal company, which is a recommended practice outlined in the guidance. SAT does not collect data from airlines on the types of waste generated and recycled. Another practice outlined in the guidance is cardboard and pallet collection, which SAT currently collects for employees and tenants. A construction waste management plan is recommended, and although SAT does require contractors to recycle soil, there is no formal plan for construction services.
Industry Practice: Recycling bins for staff and terminal passengers	SAT provides recycling bins for department staff as well as in the terminal for passengers. In addition, SAT provides waste pickup for tenants.
Industry Practice: Co-locate waste and recycling bins, including compost bins	SAT does not co-locate its waste and recycling bins, and it currently does not have composting bins in the terminal.
Industry Practice: Soil recycling	Although SAT does not require construction contractors to have a balanced earthwork plan, it does require that contractors utilize recycled soil for construction activities. SAT does collect metrics on soil reuse.
Industry Practice: Waste metrics	SAT keeps metrics on the amount of single stream recycling goods, batteries, and general waste. SAT's waste collection company also provides monthly metrics on the waste it collects.



Industry Practice: Dedicated recycling personnel	SAT does not have a single department or staff person dedicated to coordinating recycling activities throughout the campus. The responsibility for managing recycling falls to individuals in different departments.
Industry Practice: Educational programs and signage	SAT does have signage for recycling bins. The SAT Environmental Stewardship department also occasionally includes recycling related topics in its newsletter.
Industry Practice: Develop Green Team	SAT does not have a green team comprised of department staff, tenants, airlines, and concessionaires.
Industry Practice: Environmentally friendly purchasing practice	SAT follows the city of San Antonio's established Environmentally Preferred Purchasing Policy that works to have city departments consider recycled/environmentally friendly products and to reduce paper waste.
Industry Practice: Recycling goal-setting	SAT follows citywide sustainability and recycling goals but does not have airport-specific recycling goals.
Industry Practice: Coordination and cooperation with airlines, tenants, and concessionaires	SAT does not coordinate recycling activities with airlines to capture recycling metrics. SAT does coordinate with tenants and concessionaires on recycling effort; including providing recycling for cardboard, grease/oil, plastics, paper, glass, palettes, printer toner, and batteries; and provides recycling pickup five days a week.
Industry Practice: Construction materials recycling	SAT recycles scrap metals but does not have a requirement or recommendation for recycling construction materials.
Industry Practice: Donating or composting surplus food	SAT does recycle surplus food to local organizations.
Industry Practice: Recycling education and marketing	SAT's Environmental Stewardship department occasionally sends out newsletter discussing recycling. SAT does not have a formal recycling program, including marketing.
Industry Practice: Set a zero-waste goal	SAT does not have a zero-waste goal.
Industry Practice: Use waste reduction strategies (e.g. water bottle filing stations, hand dryers)	SAT does have some waste reductions strategies, including water bottle filling stations; hand dryers; environmentally friendly purchasing policy that includes reducing paper waste; the Environmental Stewardship department provides bottles/cups to staff;



Industry Practice: Composting food and landscaping waste	SAT does not have any composters for food or landscaping waste.
Industry Practice: Conduct regular waste stream composition studies	SAT conducted a waste stream composition study several years ago but has not regularly conducted waste stream studies. SAT does track how much recycled goods are collected but the data does not determine composition.

The areas where SAT is not complying with regulations and industry best practices were consolidated into recommendations for SAT to incorporate in its recycling plan. These recommendations are found in the *Recommendations* spreadsheet.



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#### SAN ANTONIO AIRPORT RECYCLING PLAN

#### Interview Responses

Date	Name	Department	Current Practices	Type(s) of Waste Generated	Quantity and Location of Waste Collection	Additional Information
22-Aug-18	John Kokesh	SAT - Terminal Services	Single stream recycling Recycling pallets, grease, cardboard, and scrap metal Trash compaction on site once a week Trash and recycling pick up for tenants five times a day Trash auditing by waste removal company	Pallets, grease, cardboard, scrap metal, food, paper products, plastic products	15 to 16 tons of single stream recycled goods per month 96 gallon toters provided throughout campus to encourage recycling participation	Decentralized recycling efforts and large campus make recycling difficult. Recycling and trash bins are not colocated throughout the terminal.
23-Oct-18	Randy Gray	SAT - Airport Facilities	Recycles several types of waste, but do not track recycled goods.	Vehicle batteries, tires, oil, oil filters, petroleum products, scrap metal, fluorescent lamps.	Not tracked	Many tenants handle their own recycling.
23-Oct-18	Steve Southers, Josh Heiss	SAT - Environmental Stewardship	Recycles several types of waste, including soil from construction projects, toner cartridges, etc. Contractors are required to recycle soil for construction projects Sends out occasional newsletter encouraging recycling Purchase environmentally friendly products but does not track purchases Supply department staff with reusable water bottles	Municipal solid waste, construction and demolition waste, green waste, food waste, deplaned waste, lavatory waste, spill cleanup and remediation waste, hazardous waste, and universal waste Specifically, batteries, toner cartridges, paper, plastic, glass, cardboard	80 to 100 pounds of batteries per year 100 pounds of toner cartridges per year 14 tons of single stream recycled goods per month Locations for waste: compacting dumpster, Building 1039 (toner and batteries), terminals (single stream recycled goods), department buildings (single stream recycled goods), cardboard recycling area	SAT should have a dedicated employee to handling airport recycling efforts San Antonio only has single stream recycling, which makes some good more expensive to recycle than to dispose in the landfill
22-Oct-18	Karen Ellis	SAT - Customer Experience	None indicated	Municipal solid waste, construction and demolition waste, green waste, food waste, deplaned waste, lavatory waste, spill cleanup and remediation waste, hazardous waste, and universal waste	None indicated	

#### SAN ANTONIO AIRPORT RECYCLING PLAN

#### Existing Plan and Practices

Issuing Authority Type	Issuing Authority	Issuing Date Regulation/Guidance	Summary	Recycling Applicability of Regulation/Guidance	SAT Adherence
City	City of San Antonio	Administrative Directive 9.1 Recycling 1-Jun-09 Participation	Provides guidelines, roles and responsibilities for departments and employees in City of San Antonio facilities, promoting recycling and importance of providing recycling receptacles.	The guidelines state that employees and department visitors should recycle cleaned recycled goods; dispose of soiled goods that cannot be thoroughly cleaned; keep garbage out of recycling bins; and ensure convenient options to recycle for employees and visitors.	t SAT currently adheres to city guidance by providing recycling bins to employees and in the terminal for passengers and tenants.
City	City of San Antonio	Administrative Directive 9.2 2-Apr-10 Environmentally Preferred Purchasing Policy	Sets forth guidelines for city officials to purchase "environmentally-friendly products and services".	The guidelines state that city departments must consider the purchase of recycled/environmentally-friendly products; use recycled paper; print on both sheets of paper; and attempt to include paper and printing requirements in contracts for consultants/contractors.	SAT currently adheres to purchasing guidelines established by the city.
City	San Antonio Airport System		Outlines the rules governing activities of the airport from parking to deicing to general users of the airport.	The regulations outline recycling efforts in Sections 3-23, 3-25, 3-27, 3-69, 3-97, 3-100, and 3-103. Generally, these sections note the following: guidance for proper disposal techniques for garbage by type and location within the airport; abidance to environmental laws and regulations; determination of a tenant environmental liaison; and reporting of disposed and/or recycled de-icing fluids.	in SAT generally adheres to this regulation, but it has not enforced tenants having an environmental liaison.
Federal	Federal Aviation Administration	30-Sep-14 and Waste Reductions Plans	Describes the recycling plan outline and provides case studies from airports nationwide.	The guidance is applicable to recycling efforts particularly sections outlining waste auditing, waste management contracts, and planning to minimize waste generation.	SAT does not have a recycling plan, but when drafted, SAT will follow this guidance.
State	Texas Administrative Code	Title 30 Environmental Quality Part 1 Texas Commission on Environmental Quality Chapter 328 Waste Minimization and Recycling		The regulation notes that the statewide goal for waste diversion from the total municipal solid waste stream is 40 percent as well as provides calculations for local, regional, and statewide determination of annual rates, recordkeeping, and reporting requirements. The regulation also allows for a grant program to assist local governments and private entities with certain oil recycling efforts and lays out eligibility requirements.	SAT does not track waste diversion; so it is unknown whether it is tracking close to the 40 percent goal for waste diversion.
Federal	Federal Aviation Administration	Airport Recycling, Reuse, and Waste 20-Nov-14 Reduction Plans	Provides background information including legislative authority and AIP-Eligibility. Also provides information on guidance on Airport recycling plans with, background and applicability, internal and industry coordination, recycling plan scope and, summary of content.	The guidance provides the regulatory basis for recycling plans including: FAA Program Guidance Letter 12-08 and FAA Order 5100.38D, AIP Handbook. It notes that recycling plans are anticipated to be scaled in detail to the size of the airport and that based on data collected on large to medium hub airport most had some sort of recycling efforts. The guidance also provides a brief outline of the "Airport Recycling, Reuse and Minimization Guidance" and provided the "Recycling, Reuse and Waste Reduction at Airport: A Synthesis Document," as a resource.	
Federal	Federal Aviation Administration	Memorandum: Guidance on Airport 30-Sep-14 Recycling, Reuse, and Waste Reductions Plan	Provides guidance on preparing airport recycling, services, and waste reduction plans.	The memorandum provided guidance on including recycling plans in master plans including providing legislative requirements, references and guidance documents, definitions of typical types of airport waste, and factors that may impact the development of a plan. In addition, the memorandum outlines the sections that must be included in all recycling plans, which are listed below.  a. Facility Description and Background  b. Waste Audit  c. Review of Recycling Feasibility  d. Operation and Maintenance (O&M) Requirements  e. Review of Waste Management Contracts  f. Potential for Cost Savings or Revenue Generation  g. Plan to Minimize Solid Waste Generation	SAT does not have a recycling plan, but when drafted, SAT will follow this guidance.
City	City of San Antonio	Recycling and Resource Recovery Plan	Provides an overview of the changes made to San Antonio's Recycling and Resource Recovery Plan.	The notable changes made to the plan include: implementing zero waste initiatives; reaching the 60 percent residential waste reduction by 2025 instead of 2020; and allocating funds for a commercial recycling program manager.	SAT could adhere to this plan by implementing zero waste initiatives and setting a zero waste goal.
City	City of San Antonio	11-Aug-16 City of San Antonio Sustainability Plan	Focuses on the three pillars of sustainability (economic, environmental, and social), and provides a roadmap for both the community and the municipal government to achieve the overall vision of a sustainable San Antonio.	Plan outlines objectives for the city of San Antonio to achieve sustainability including by diverting waste from land fills using recycling and the city's Environmentally Preferred Purchasing Policy and creating educational	SAT currently adheres to city guidance by providing recycling bins to employees and in the terminal for passengers and tenants.
Federal	112th Congress House of Representatives	Feb-12	Changes made to FAA sections for airport master plans.	The regulations added a provision for airport master plans, including updates to existing plans, to include provisions for solid waste recycling.	SAT does not have a recycling plan, but when drafted, SAT will follow this guidance.
City	City of San Antonio	San Antonio International Airport 2011/2012 Sustainability Plan	Encourages recycling, availability of recycling collection areas and promotes use of recycled paper for San Antonio City departments.	The plan notes the following actions for the airport: having recycling bins in most areas of the airport; refraining from printing emails unless necessary; unsubscribing for physical, junk mail; and encouraging tenants to recycle.	SAT adheres to the plan by providing recycling bins, encouraging emails not to be printed, and encouraging tenants to recycle by providing bins and picking up waste.
City	City of San Antonio	Preferred Purchasing Guidelines	This document promotes the use of recycled products/ recycled content, like printing, in City departments.	The guidelines task each city department with creating contracts requiring recycled products, if possible, and recording and reporting on recycled product purchases.	SAT encourages purchasing recycled products but does not track purchases.
State	State of Texas	Health and Safety Code; Title 5. Sanitation and Environmental Quality; Subtitle B. Solid Waste, Toxic Chemicals, Sewage, Litter, And Water; Chapter 361. Solid Waste Disposal Act		The regulation states that there must be a set percentage of recycled content to define a recycled product; establishes a solid waste resource center and a waste minimization and recycling office to assist local governments with recycling and waste diversion efforts; sets up research efforts for developing recycled waste markets in the State; and sets aside funds for waste diversion efforts.	SAT could utilize the waste minimization and recycling office if it deems help necessary from the State (administered by Texas Commission on Environmental Quality).

1

# SAN ANTONIO AIRPORT RECYCLING PLAN

# Recommendations

Recommendation No.	Recommendation Type/Section	Recommendation
1	General	Utilize the latest FAA guidance on airport recycling plans to create a plan for SAT. The plan should include procedures and locations for recycling standard recyclables (e.g. glass, plastic, paper), electronic waste, compostable waste (e.g. food and landscaping trimmings), office supplies (e.g. printer cartridges), and construction materials.
2	Incentives	Create recycling incentive opportunities for staff and tenants to encourage recycling participation. Incentives can include acknowledgements such as Recycler of the Month; media coverage highlighting top recyclers; and competitions among tenants and/or departments.
3	Layout	Co-locate recycling and waste bins so people have a nearby recycling option, which can decrease the amount of recycled goods that end up in the waste bin. Create a map of recycling bins, dumpsters, compactor, and other waste collection items airport-wide for staff and airlines to quickly determine waste locations.
4	Management	Develop a Green Team consisting of different airport staff and representatives from tenants. Establish one lead for the Green Team who can serve as both head of the team and lead recycling efforts among the airport departments. Having one point of contact for airport-wide efforts can make tracking and reporting on recycling efforts easier to coordinate and maintain. Current SAT guidance notes that tenants are required to have an environmental liaison. The tenant liaison could also serve as a member of the Green Team.
5	Management	Obtain airport and city leadership buy-in on the draft recycling plan and goals to encourage participation by lower-level staff. Also, look to obtain leadership buy-in from tenant and airline staff. Leadership buy-in should be publicly displayed in a press release, media event, and noted in the final recycling plan.
6	Reporting	Determine feasible recycling goals based on baseline data and include waste diversion from airlines, if possible. Include goals for specific types of waste that are easily recyclable, such as cups, and work with tenants to track goals for their easily recyclable waste. If airlines recycle deplaned waste at the airport, create goals and metrics for the airlines as well. Baselines should also be established for the cost savings from landfill diversion and tracked. Cost savings data can be provided to staff and tenants to encourage continued recycling efforts.
7	Reporting	Conduct a waste audit, as required by FAA Guidance, of staff, tenants, and airlines to create a baseline of waste generation at SA1. Track the following recycling metrics based on available guidance and industry best practices.  -Recyclable goods, including types (e.g. plastics, paper-products) if possible  -Compostable goods, including types (e.g. food waste, BPI products) if possible  -Construction materials, including types (e.g. steel, wood) if possible  -Liquid goods, including types (e.g. grease, car oil) if possible  -Electronic goods  -Reused good, including types (e.g. wood, asphalt) if possible  -Non-recyclable waste  -Cost savings from recycled goods  -Environmentally-friendly purchases  -Total landfill waste diversion  Tracking should also take into account goals developed by SAT, the Green Team, and those incorporated from airlines policies/procedures. In addition, tracking should occur for staff, tenant, and airline waste as feasible. At minimum, staff and tenant waste
8	Standards/Guidelines	should be tracked.  All goals for recycling efforts should include a timeframe for completion. Industry recommendations call for a five-year plan to achieve recycling goals.
9	Standards/Guidelines	Create standard for environmentally-friendly products that adhere to the city's purchasing policy, including types of products, preferred vendors, and cost-savings from recycling. Work with concessionaires to encourage purchasing of environmentally-friendly products, such as compostable (BPI-certified) cups and food storage containers and post-consumer recycled content products. If possible, include the purchase of environmentally-friendly products as a term of the leasing agreement. Environmentally-friendly products should not be limited to paper and food/beverage containers but should also include construction materials, furniture, asphalt, etc., which have pre-/post-consumer recycled products available.
10	Standards/Guidelines	Request corporate recycling policies and procedures to include in the deplaned waste recycling section of the recycling plan. Firms doing business with SAT should be encouraged to develop corporate policies and procedures if they do not have standards established.  Be sure to request any airport-specific procedures the airline may have for SAT.
11	Standards/Guidelines	Include a recycling requirement in tenant lease agreements and show reduced waste costs from recycling in billings. This would require having custom rates for tenants that are sensitive to amounts of recycled goods each tenant diverts. The "Sustainable Airport Manual" developed by the Chicago Department of Aviation has guides and checklists for developing leasing agreements.
12	Standards/Guidelines	Construction and other activities requiring excavation and/or fill should follow a balanced earthwork plan to reduce the amount of soil diversion and transport.
13	Standards/Guidelines	Create goals for reusing materials and track amounts reused. Reusable materials can include, but should not be limited to, soil, wood, asphalt, and metals.
14	Standards/Guidelines	Create goal(s) for waste reduction. Create a road map for achieving goals within a specified timeframe. Utilizing recycling metrics, determine at regular intervals (i.e. quarterly, yearly) the amount of waste reduction reached and determine if goals are being met.
15	Training	Develop training program for staff that provides recycling guidelines, goals, metrics, and reporting requirements. Incorporate training in standard new employee training and have regular educational opportunities that covers recycling best practices. Training and educational opportunities should be open to airlines and tenants to familiarize them with the SAT recycling procedures. Provide listening sessions for staff, tenants, and airlines to share their recycling experiences, best practices, lessons learned, and hurdles to recycling. Information should be documented and action items from the session should be incorporated into future training and educational opportunities.
16	Training	Promote recycling and educate proper recycling procedures to staff, tenants, and travelers through a marketing campaign that includes informative posters, signage around the terminal, and a dedicate website or page for discussing airport recycling efforts.  Educational messaging that provides transparent and helpful information regarding recycling efforts at the airport from purchasing to sorting to disposal can help encourage recycling and dispel rumors of recycled goods not actually being recycled.

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sorting to disposal can help encourage recycling and dispel rumors of recycled goods not actually being recycled.